UTM CAREER CENTRE

INDUSTRY PROFILE:

Pharmaceutical

CONTENT

What Do Pharmaceutical Professionals Do?

> *The pharmaceutical industry could be your niche if you are science-minded and enjoy collaborating with professionals working to improve people's lives.*

Overview - What Do Pharmaceutical Professionals Do?

The pharmaceutical sector is a global industry that has the fight against disease at its heart. The industry encompasses a wide range of roles, from research and development (R&D) to clinical trials to sales and marketing.

Scientists and technicians working in R&D use their understanding of chemistry, biology, physics and human anatomy to invent new drugs and products. They may design and carry out laboratory experiments, study natural events in the field or supervise animal and human testing of new products. The actual manufacturing of these treatments is often the last stage of the research process.

When a new drug is developed, clinical trials evaluate the safety and effectiveness of the medication by monitoring its effects on large groups of people. Besides ensuring the safety of the human subjects involved, the outcome of the trial itself must be validated and weighed against industry standards. Typically, government agencies approve or disapprove new treatments based on clinical trial results.
Once a medication has been approved for sale, marketers need to promote the product to physicians and other health-care professionals. This involves developing business strategies and marketing programs, including branding, communications, customer relations and event coordination.

Watch this video for insight into how medicines are made.

Following are descriptions of a few of the many professions that make up the pharmaceutical industry.

Pharmaceutical Sales Representatives

Pharmaceutical sales representatives are a major link between pharmaceutical companies and physicians and other healthcare professionals. They sell the company's products and services, such as prescription drugs, medicines or medical equipment, to a wide variety of customers, including general medicine practitioners, pharmacies and hospitals. They also work strategically to increase the use and awareness of the company's medical and pharmaceutical products.

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What Do Pharmaceutical Professionals Do? (cont.)

Pharmaceutical sales representatives often specialize in a specific medical area or product and are responsible for a certain geographic territory. They need to have thorough knowledge of how a drug works and its indications for treating various conditions when they make presentations and organize group events for physicians.

Medical Science Liaison

The Medical Science Liaison (MSL) is responsible for establishing and maintaining relationships with leading physicians, researchers, and clinicians, referred to as key opinion leaders (KOLs) at academic institutions, hospitals, pharma companies, and others within the pharmaceutical, biotechnology, medical device, and related health-care fields. Specializing in a specific therapeutic area or disease such as oncology or cardiology, MSLs help ensure that products are used effectively, serve as scientific resources and experts, advise on advances in treatments, and provide input about scientific and clinical data. Although not involved in sales, MSLs must be expert communicators who can tailor their message for a given audience while presenting complex material clearly and consistently. Extensive travel is common. MSLs have advanced scientific training and academic credentials that typically include a doctorate or comparable degree (e.g., PhD, PharmD, MD) in the life sciences.

Clinical Research Assistant

A Clinical Research Assistant works with pharmaceutical companies investigating new drugs. They help to ensure that clinical research studies are conducted according to federal regulations and international Good Clinical Practice standards. Clinical trials can involve from 20 to 1,500 people and last from one month to several years. To establish that the studies are carried out safely and effectively, the clinical research assistant reviews and processes essential documentation for accuracy and adherence to regulations. They assure processes are rigorously followed so that the data is not compromised, along with the safety of the research subjects.

Pharmaceutical Laboratory Technician

A Pharmaceutical Laboratory Technician works under the supervision of a physician and scientists on researching and developing medications. They construct and operate standard lab equipment like pH meters and centrifuges, prepare samples and specimens, test compounds, supervise experiments and record and interpret the results. They also maintain the safety and cleanliness of the pharmaceutical laboratory. While a pharmaceutical technician can find employment in government agencies, most work for private pharmaceutical companies or contract research organizations.

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What Do Pharmaceutical Professionals Do? (cont.)

Regulatory Affairs Specialist

The regulatory affairs function serves as a liaison between the pharmaceutical company and a regulatory authority, such as Health Canada or the Food and Drug Administration (FDA) in the U.S., which approve new drugs for sale. A Regulatory Affairs Specialist conducts the final check on the data before it goes to Health Canada for approval. Project teams must convince the regulatory affairs specialist that the product dossier for a new drug is consistent and complete so they can submit the application for approval to Health Canada. The work involves reviewing documents, attending meetings, and writing detailed reports. A person in this role must learn and interpret the regulations for all of the countries in which their company is doing business, and teach them to the project team. For those interested in pursuing this career, Seneca College offers a one-year post-graduate program: Pharmaceutical Regulatory Affairs and Quality Operations.

Pharmacists

As medication management experts, Pharmacists not only dispense prescribed drugs, but also provide a range of services to patients and health care providers. These include medication reviews, chronic disease management, immunization services and wellness programs. It takes at least five years of university education to become a pharmacist: one or two years of an undergraduate program (with some science courses required), followed by a four-year professional degree pharmacy program. To become a practising pharmacist in Ontario, you must also meet the licensing requirements of the Ontario College of Pharmacists. These include practical training through an apprenticeship or internship and passing a national examination by the Pharmacy Examining Board of Canada.

Pharmacy Technicians

Pharmacy Technicians work alongside pharmacists, welcoming customers and patients and processing prescriptions and insurance claims. They are responsible for organizing, monitoring, and making sure the necessary supplies and inventory are available to fulfill patients' requests. Pharmacy Technicians typically work in retail pharmacies or those located in health centres, hospitals, and clinics. However, they may also find employment in retirement homes, rehabilitation centres or long-term care facilities.

Students interested in learning more about the pharmaceutical industry can take online courses through the Council for Continuing Pharmaceutical Education, which also offers an accreditation program for industry professionals.

Fast Facts

Canada ranks 10th
among worldwide pharmaceutical markets, with $22 B in sales in 2018, a 4% increase over 2017. (Source: IQVIA MIDAS, MAT December 2018)

Pharmaceuticals are the
second largest component of health care costs in Canada, representing almost 16% of total expenditures, according to the Canadian Institute for Health Information.

Ontario's pharmaceutical
sector employs about 27,500 people, accounting for about 55% of Canadian pharmaceutical employment.

Ontario hosts some of
Canada's biggest life sciences R&D spenders, including Sanofi Pasteur, GlaxoSmithKline, Janssen and Apotex, which have their Canadian headquarters in Ontario.

Approximately 16,650 people
work as pharmacists in Ontario, with 78% working in retail stores and 14% in hospitals.

About 2,500 people
work as biological technologists and technicians in Ontario, with 87% working full-time.

An estimated 7,100 people
work as chemical technologists and technicians, including quality control technologists in Ontario.

Industry Trends

Canada's pharmaceutical industry continues to face challenges

Canada's Pharmaceutical Industry

Canada's pharmaceutical industry consists of an ecosystem of multinational enterprises (MNEs) and local companies. These include brand-name pharmaceutical companies, generic drug firms, biopharmaceutical small and medium sized enterprises (SMEs), contract research organizations (CROs), contract manufacturing organizations (CMOs) and contract service providers (CSPs).

Most major branded pharmaceutical companies, for example Johnson & Johnson, which develop and market new patented products, are foreign multinationals with subsidiaries in Canada. Generic companies, such as Canadian-owned Apotex, manufacture and market lower-priced generics once patents of branded products expire. The generic segment is a mix of Canadian-based and foreign multinationals and smaller companies.

Biopharma Companies

Biopharma companies in Canada are small and generally focused on early stage research and development with few marketed products. The fourth major player in the industry is contract service providers (CSPs), a mix of local smaller Canadian-headquartered companies and larger foreign companies. CSPs provide a wide range of contract services to the industry, from research and development (R&D) and manufacturing to sales and administration. The industry is clustered mainly in the metropolitan areas of Toronto, Montreal and Vancouver.

Restructuring Factors

For some time, the global pharmaceutical sector has been undergoing major restructuring. Factors such as competition from markets like India and China, record levels of expiring patents for major brand products, a lack of new blockbuster products and slower government approvals of new products, have all contributed to a contraction in the Canadian market. At the same time, governments and insurance companies, seeking lower-cost medicine, have shifted the market share towards the generic segment.

In response, there has been an increase in mergers and acquisitions with pharmaceutical companies partnering with private companies, government and university research labs and hospitals and subcontracting for certain functions (manufacturing, packaging, labelling, regulatory affairs).

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Industry Trends (cont.)

Clinical Research Trials

A recognized area of strength for the Canadian pharmaceutical industry is clinical research trials to test the efficacy of new drugs. Canadian R&D facilities of global pharmaceutical companies are primarily devoted to clinical research management instead of pure research. Although the number of clinical trials received in Canada has declined since 2010, more than 3,200 clinical trials are underway in Ontario at any given time.

JLABS Incubator in Toronto

In 2015, the Ontario government, University of Toronto, and MaRS Discovery District collaborated with Janssen Inc. and Johnson & Johnson Innovation to launch a JLABS incubator in Toronto. The facility supports start-ups with lab space, programs and potential investment partners. Toronto is the first city outside of the U.S. to host a JLABS incubator.

Pricing

Since prices for patented medicines in Canada are now among the highest in the world, Health Canada, which regulates the pharmaceutical industry, announced in August 2019, changes to the way it will evaluate new drug prices, which it says will save Canadians billions over the next 10 years. Among the changes, the Patented Medicine Prices Review Board will now have to consider a drug's "value to and financial impact on consumers in the health system" when determining if a price is excessive. After public consultations, the new regulations will come into effect on July 1, 2020. This could lay the groundwork for a national pharmacare program, which some political parties promised in the 2019 federal election.Innovative Medicines Canada, the Canadian pharmaceutical industry association, which represents 41 pharmaceutical companies, stated the amendments would stifle the development of new medicines and investments in Canada's life sciences sector, which could have an impact on jobs.

Drug Shortages

Drug shortages have been an ongoing industry issue in Canada and around the world since about 2010. According to a 2018 report by the C.D. Howe Institute, during a recent three-year period, approximately 1,000 shortages, mainly of generic drugs, have been reported annually, affecting 1,250 products. Drugs that often make the short-supply list include everything from EpiPens, to treatments for bladder cancer, to antidepressants. Drug companies are required to warn Health Canada at least six months in advance of an anticipated supply problem, or within five days of learning about one.Numerous factors can lead to drug shortages, including a lack of chemicals in the manufacturing supply chain, pharmaceutical companies discontinuing certain drugs, global demand for drugs, lower prices for generics and changes in clinical guidelines. In October, 2019, U.S. President Donald Trump called for quicker action to allow cheaper Canadian drugs to be imported into the U.S. Experts say the move has the potential to put Canada's drug supply at risk of further shortages in the future.

Employment Outlook for Pharmaceutical Professionals

The employment outlook will be fair for Pharmacists (NOC 3131) in Ontario for the 2018-2020 period, according to the Government of Canada's most recent Outlook Report. Over the period 2017-2026, new job openings are expected to total 15,000, while 15,100 new job seekers are expected to be available to fill them. Employment growth is expected to be higher than the average for all occupations.

Pharmacists

In Ontario, there are almost twice as many pharmacists as there were a decade ago. With an ageing population, the need for prescription drugs and health services will increase, supporting demand for these professionals. The rising rate of some chronic diseases will require medication management, further adding to the demand for this occupation. However, more competition and expected tightening in this segment of the retail industry may affect job prospects, especially for small independent pharmacies. The lowering of both generic and patented drug prices over the forecast period could affect costs for pharmaceutical companies and distributors and could filter into increased costs for pharmacies and health and personal retailers. This may affect job opportunities for these professionals.

Biological Technologists

The employment outlook will be fair for Biological Technologists and Technicians (NOC 2221) in Ontario for the 2018-2020 period. Over the period 2017-2026, new job openings are expected to total 3,300, while 3,500 new job seekers are expected to be available to fill them.

Professional Scientific and Technical Services Sector

Many of these professionals are employed in the professional scientific and technical services (PSTS) sector, mainly in scientific research and development services. While PSTS has seen an increase in employment overall, scientific research and development services has experienced a decline over the last couple of years which may affect employment opportunities for this occupation. Ontario has a significant life sciences cluster which has seen a few expansions recently. This should sustain and add job openings for these technologists and technicians. Generally, some of the work opportunities within the occupational group may be affected by the amount of research grants and project funding available.

This occupational group includes various specializations. Employers require completion of a college diploma or bachelor's degree in an area such as agriculture, microbiology and biotechnology.

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Employment Outlook for Pharmaceutical Professionals (cont.)

Chemical Technologists and Technicians

The employment outlook will be fair for Chemical Technologists and Technicians including Quality Control Technicians (NOC 2211) in Ontario for the 2018-2020 period. Employment in this occupation has improved in the province over the last decade and conditions should remain stable in the short term.

Chemical Manufacturing

Within chemical manufacturing, the largest number of technologists and technicians are employed in areas related to pharmaceutical, basic chemical, and paint and adhesive production. The industry is experiencing slower growth due to recent declines in sales in the pharmaceutical and medicine manufacturing segment. The renegotiation of the North American Free Trade Agreement (NAFTA) affecting exports, and changing environmental regulations, may further affect growth and employment over the forecast period.

Government Efforts

Government efforts to reduce the cost of patented drugs, by modernizing the pricing framework under the Patented Medicines Regulations, could create some instability in this subsector. Drug makers have indicated that changes to the pricing framework could hinder their ability to continue investing in Canada and potentially result in job losses over the forecast period. In particular, job prospects in this field may be better in the Greater Toronto Area and central Ontario where most pharmaceutical companies are located.

What You Need To Succeed

What you need to succeed

Good communication skills are vital in the pharmaceutical industry, where professionals often work in cross-functional teams. Other relevant skills include managing time effectively, meeting deadlines, appraising literature, being creative and solving problems. A role in pharmaceutical sales will require confidence, the ability to work both alone and as part of a team, drive and ambition. Conversely, roles in research will require strong analytical and research skills, attention to detail and excellent presentation and communication skills. One of the best ways to prepare to work in the industry is through a co-op placement or internships.

In-Demand Jobs and Salary Ranges

Job Title	Salary Range
Clinical Research Assistant	$30,000 - $50,000
Laboratory Technologist	$32,795 - $98,748
Medical Science Liaison	$77,000 – $134,000
Pharmaceutical Sales Representative	$26,910 - $79,693
Pharmacist	$54,112 - $144,300
Pharmacy Technician	$31,000 - $63,000
Quality Assurance Associate	$38,000 -$68,000
Regulatory Affairs Specialist	$33,345 - $109,163

Where the Jobs Are

These industries show the strongest demand for pharmaceutical professionals:

- Pharmaceutical Companies
- Contract Manufacturing Organizations
- Contract Research Organizations
- Contract Service Providers
- Pharmacies
- Hospitals
- Clinics
- Universities

Industry Associations

Industry Associations	Website Link
Canadian Association of Professionals in Regulatory Affairs	https://capra.ca/
Canadian Generic Pharmaceutical Association	http://www.canadiangenerics.ca/
Canadian Pharmacists Association	http://www.pharmacists.ca/
Canadian Society for Pharmaceutical Sciences	http://www.cspscanada.org/young-scientist-network-of-csps/
Council for Continuing Pharmaceutical Education	https://www.ccpe-cfpc.org/en/
Innovative Medicines Canada	http://innovativemedicines.ca/
Life Sciences Ontario	http://www.lifesciencesontario.ca/home/index.php
Ontario Pharmacists Association	http://www.opatoday.com/

Where to Find More Information

Sources:

- BioTalent Canada
- Canadian Drug Shortage
- Council for Continuing Pharmaceutical Education
- Government of Canada
- Government of Ontario
- Innovative Medicines Canada

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