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CAPCA

The Cancer Workforce Scoping Study: A Report from the Front Lines of Canada's Cancer Control Workforce

Technical Report

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The Joint CAPCA-CPAC Cancer Workforce Scoping Study Steering Committee

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We hope that this report will jumpstart:

- an ongoing process of documenting and sharing the challenges and successes that the cancer control workforce faces
- the process of developing a coherent and pan-Canadian approach to make the most of the potential of the people who work in cancer care[1], delivering high quality, appropriate compassionate care to Canadians — within acceptable wait times to produce the best possible patient outcomes.

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This report was prepared by Leslie Gaudette and Christine Da Prat of the Association Strategy Group for the Canadian Partnership Against Cancer's Steering Committee of the Cancer Workforce Scoping Study project.

1 For the purposes of this report, cancer care encompasses all health services provided along the cancer control continuum, from preventive services, screening, diagnosis, treatment to supportive and palliative care — to well Canadians and to cancer patients, cancer survivors and their families.

Executive Summary

In 2007, the Canadian Association of Provincial Cancer Agencies (CAPCA) and the Canadian Partnership Against Cancer–Human Resources Action Group (CPAC-HRAG), through funding from the Public Health Agency of Canada, commissioned the *Cancer Workforce Scoping Study* (CWSS) to be conducted under their joint direction.

The Joint CAPCA-CPAC *Cancer Workforce Scoping Study* (CWSS) was the first of its kind in Canada. Its purpose was to:

- Map out the trends and challenges that the cancer control workforce faces.
- Provide information and recommendations that will lead to the development of a human resources strategy in cancer control.

The study included:

- a comprehensive review of the scientific literature and relevant databases
- cross-Canada consultations with representatives drawn from 10 selected occupations (family physician, palliative care physician, pathologist, medical oncologist, radiation oncologist, surgical oncologist, registered nurse [oncology specialist], nurse practitioner, medical physicist and radiation therapist) and with stakeholder groups (e.g., provincial cancer agencies and educational institutions). The consultations included interviews, site visits and focus groups.

An Era of Uncertainty for the Cancer Control Workforce

The members of the cancer control workforce and the system that supports them face many uncertainties:

- Who will replace them when they retire?
- Where will the next new hire for their group come from?
- Will their provincial/territorial economies be able to provide financial resources to support their programs?
- How much longer can they keep up with the increasing flow of patients and survivors?

A Period of Unprecedented Technological Change

Intricate and innovative technology and new, expensive equipment continue to be introduced. Cancer control workers are both excited and challenged by the need to adapt to these innovations that, while considered advanced today, may be obsolete in five years.

New technology necessitates continuous on-the-job training, more formal education, and continual review and redesign of work processes — all while keeping in mind patient needs, work efficiencies and quality assurance.

Technological changes increase the capacity to plan more precise and personalized treatments. This adds to the planning time, but patients and workers share the rewards of better patient outcomes.

Health System Reform

Like everyone in the health sector, the people working in cancer control do so in a time of major health care system reform and ongoing change. This includes the:

- implementation of the electronic health record
- need to balance training on new equipment and meeting wait time guarantees
- move to inter-professional education and team-based approaches to providing care
- reorganization of health care into, and now out of, regional health care authorities
- need to provide better care to rural, remote and aboriginal communities.

Collaborative Care Delivery

Canada’s cancer control workforce often serves in the front lines. Increasingly, its members are working with the broader health care workforce to meet cancer patient needs.

Treatment successes are leading to an ever-growing number of cancer survivors. Many people receive care in their local community. Increasing survivorship and new treatment options mean greater integration of cancer care into both acute care and community settings and the management of cancer as a progressive chronic disease. Central support

(e.g., telehealth, increasing digital capabilities to share medical results, the emerging electronic health record) makes this possible.

Restoring Protected Time

Cancer control workers are stretched to the limit, and beyond. Their regular working hours are consumed with the ever-increasing clinical demands from the growing number of patients and survivors. In many areas of care, the system appears close to the breaking point. Protected time for workers has rapidly dwindled, if it exists at all. This time is essential and must be consciously built back into the system.

Protected time makes possible:

- ongoing training to learn new procedures and equipment
- being a preceptor for students and on-the-job trainees
- coaching, mentoring and supervision to develop administrative and managerial skills for tomorrow's leaders
- ongoing and continuing education to keep up with new knowledge
- participating in research projects to document better ways to provide cancer control services
- making presentations and publishing leading practices
- assessing and designing new processes that ensure effective quality control, effective job design and shift scheduling for cancer control medical and professional staff.

Challenges that Cancer Control Workforce Managers Face

Cancer control workforce managers are committed, resilient and creative in finding solutions to the many challenges they face. They are ingenious at working with the available resources to design viable models of service delivery and attempting to deal with the new roles of workers — physician assistants, nurse practitioners, clinical nurse specialists or patient navigators.

However, managers are frustrated by the:

- failure of funding to match the growth in the need for cancer control services
- lack of recognition in federal and regional funding formulas for the increasing complexity of care that they must somehow provide
- lack of basic information such as data, planning models, knowledge translation and health services research to support national sharing of models of best practice. Due to varying approaches used in

different jurisdictions, Canada has many natural experiments underway — yet the published literature documents only the tip of the iceberg.

A Workforce in Transition and Stretched Beyond Its Limits

Canada's cancer control workforce is in transition. It is fighting from the trenches on many fronts simultaneously. It is stretched to the point where the ability to deliver quality patient care is being impaired.

Canada has no strategy and no systems in place to plan for or manage its cancer control workforce — a real challenge given its many stakeholders. The lack of information in key areas is a serious obstacle to planning. There are information gaps about many key occupations and what services health care providers actually provide to cancer patients. Yet, existing databases have a wealth of information that could be put to good use in human resources planning.

Conclusions

When it comes to the cancer control workforce:

- Planning is fragmented.
- Canadian research on health human resources is limited.
- No overall perspective exists for Canada's cancer control workforce.
- Many key problems are highly fragmented. The presence of many stakeholders makes it impossible for any one jurisdiction to resolve the problems it faces on its own. The labour pool in Canada for some of the more specialized occupations amounts to a few hundred people. These numbers are too small to manage supply and demand effectively within each provincial health care system.

To solve these challenges and ensure a sustainable supply of cancer control workers throughout the country, Canada's cancer control providers are consistently calling for pan-Canadian human resources co-ordination and planning. Such an approach would include co-ordinated:

- health services research
- information exchange
- knowledge sharing of service delivery approaches
- planning of workload standards development
- quality assurance mechanisms that "have teeth."

Recommendations

The *Cancer Workforce Scoping Study* proposes eight recommendations. They are drawn from the ideas and suggestions of the people who participated in the study and from the Joint CAPCA-CPAC Cancer Workforce Scoping Study Steering Committee.

Recommendation 1: Co-ordinate a pan-Canadian approach to cancer control workforce planning.

Recommendation 2: Develop a human resources strategic action plan for cancer control.

Recommendation 3: Forge networks to promote collaboration among all stakeholder groups to enhance human resources planning, starting with a knowledge/information exchange forum for stakeholder groups and a network to build research capacity:

> *Recommendation 3.1:* Create a forum for stakeholder groups, including governments, to collaborate and exchange knowledge and ideas on educational needs, issues and challenges.
>
> *Recommendation 3.2:* Build research capacity by creating a network of researchers, data analysts and program planners to work towards addressing the data gaps, and continue to share knowledge and approaches to common problems.

Recommendation 4: Develop and implement strategies to retain and recruit health care providers in cancer control.

Recommendation 5: Develop program implementation models and human resources planning standards and guidelines that ensure the care is appropriately and safely delivered.

Recommendation 6: Document leading practices to demonstrate the effectiveness of innovative approaches to service delivery and provide working models to show how these may be effectively integrated into the cancer control system, recognizing that larger and smaller centres may have different needs.

Recommendation 7: Develop better work processes through process mapping approaches to optimize the use of competencies and ensure effective use is made of all resources, including technology and informatics, to deliver care and ensure smooth workflow.

Recommendation 8: Assess the effectiveness of inter-professional teams in providing patient-centred care and determine the enablers and barriers to their effective implementation.

Chapter 1 Introduction

Canada's cancer control system is facing unprecedented challenges. Each year brings a relentless increase in the number of newly diagnosed patients requiring treatment. More cancer survivors require more care over a long period as treatment advances improve patient outcomes, with therapy delivered over a longer time. The cancer control workforce is at the forefront of educating to prevent cancer and in providing quality, compassionate care to the ever-increasing number of newly diagnosed patients and survivors. However, this is not the only challenge they face. Health care reform in Canada has been ongoing for nearly two decades, with increasing regionalization of health care delivery, new approaches to primary health and patient-centred care, reducing wait times in key areas, the development of the electronic health record (EHR), an emerging focus on inter-professional education and an emphasis on performance measurement.

The delivery of cancer care has long occurred at arm's length from the mainstream health system. Now, there is increasing integration with acute care health delivery and initiatives for chronic disease prevention and management. At the same time, some provinces have developed service delivery models to manage cancer patients and survivors in their local communities — communities that are geographically remote from the regional cancer centres that have been the stalwart providers of cancer care in Canada for decades. Further, the cancer system is continually challenged to embrace innovation and implementation of a technology "explosion" that affects radiation, systemic and surgical therapies, and diagnostic radiology and pathology. Human resources managers in the system, together with their staff, must contend with all of these new and innovative directions to ensure they have the right provider in the right place to provide the right service to the patient within an appropriate period.

1.1 Cancer Care and Cancer Control in Canada

By the mid-1970s, the cancer control continuum evolved to describe the various points along the continuum where cancer patients and healthy people interact with the cancer system. These range from cancer prevention, early detection and screening, diagnosis and staging, treatment, supportive and rehabilitative care, to palliative care.[2] The exact phases in the continuum may vary — for example, supportive and

2 This grouping of the continuum is the one that the Canadian Partnership Against Cancer uses.

rehabilitative care may be combined with treatment. The United States National Cancer Institute includes survivorship as a separate phase (US National Cancer Institute, 2008). What is clear is that:

> "It takes more than one physician or clinic to treat and control cancer; it takes an entire healthcare team that includes family physicians, public health professionals, oncologists, nurses, pharmacists, therapists, spiritual care providers and community volunteers. As cancer patients go through the health care system, they also typically require different diagnostic, treatment and supportive care services, often at different facilities" (Cancer Care Ontario, 2008a).

Cancer control in Canada operates within the overall health care system. Both have developed — to some extent in parallel — over many decades. Understanding the evolution of cancer control in Canada and its increasing integration with the general health care system provides context to the issues that affect Canada's cancer control workforce.

1.1.1 Early developments in cancer control: 1930s to 1980s

Canada's publicly funded cancer control system originated in the 1920s when several provinces purchased the expensive radium needed for treatment. Saskatchewan and Manitoba in 1930 and British Columbia in 1935 were the first to establish centralized cancer care organizations. In the 1940s, Alberta and Ontario implemented cancer foundations (Hayter, 1998). Subsequently, Nova Scotia and Newfoundland and Labrador set up cancer foundations. New Brunswick, Québec and Prince Edward Island manage cancer care through their provincial ministries of health.

A number of provinces such as British Columbia and Saskatchewan took a more comprehensive and integrated approach. In particular, British Columbia established tumour groups in the early 1970s. These groups review current medical literature and practice and develop clinical practice guidelines for most cancers. The BC Cancer Agency effectively enforced them, evidenced by a greater uptake of breast cancer guidelines (Goel et al., 1997). This greater co-ordination may contribute to better cancer outcomes in British Columbia and Saskatchewan (Gaudette, Altmayer, Wysocki, & Gao, 1998).

Adjuvant chemotherapy and systemic therapy protocols became more common in the late 1970s. The result was the delivery of more treatment on an outpatient basis or in the community, and the introduction of medical oncologists to the cancer care team (Kennedy, 1999). Manitoba introduced community oncology clinics as early as 1978 (Schipper & Nemecek, 1991). These decades saw the development and

application of the principles of primary, secondary and tertiary disease control to cancer.

1.1.2 1990s: Evolution from cancer care to cancer control

Starting in 1996, further collaborative efforts led to the Canadian Strategy on Cancer Control (CSCC). The strategy brought the Canadian Association of Provincial Cancer Agencies (CAPCA), the National Cancer Institute of Canada (NCIC), Canadian Cancer Society (CCS) and Health Canada together with a broad spectrum of cancer stakeholders, including patient advocates. The CSCC had five main priorities: human resources, rebalancing focus to include prevention, supportive care, palliative care and standards. CAPCA was formally established in the 1990s to co-ordinate cancer control efforts across Canada (Health Canada, 2004).

During the 1990s, there was a growing understanding of the need to integrate prevention across all chronic diseases, including cancer, due to common risk factors. New cancer control initiatives included:

- implementation of breast screening programs in all provinces
- increased use of the population health approach for program planning.

The trend to more outpatient care for cancer continued due to cuts in hospital beds and changes to surgical procedures such as breast conserving surgery (Gaudette et al., 2004). New systemic therapy treatment approaches made more lines of therapy available to treat cancer patients, leading to more complex care trajectories and increased demand for human resources (Health Canada, 2004).

In the early 1990s, NCIC, the CCS and Health Canada undertook an initiative to provide greater co-ordination among stakeholders at the national, provincial and local levels (Health Canada, 2004). Initial results were most obvious at local and provincial levels. The results highlighted the important roles that prevention and screening play to achieve overall cancer control.

1.1.3 2000s: Cancer control is increasingly integrated with chronic disease management

During the 2000s, there was increasing development of cancer control programs in community settings, including prevention, breast screening, systemic therapy and palliative care. Several provinces continued to build on early work in Manitoba to establish community networks of practitioners to provide cancer control programs at the local level.

Home care programs also evolved to provide supportive and palliative care. Ontario merged its regional cancer centres with their associated tertiary care hospitals.

The 2001 formation of the Chronic Disease Prevention Alliance of Canada (CDPAC) combined prevention efforts for cancer with those for other major chronic diseases. Health Canada amalgamated cancer control programs with other chronic diseases within the Centre for Chronic Disease Prevention and Control (now part of the Public Health Agency of Canada). Established in 2001, the Canadian Strategy for Palliative and End-of-Life Care considered care needs for all terminal conditions, including cancer.

In 2006, the Canadian Partnership Against Cancer (CPAC) was formed. It manages the cancer control strategy. The strategy's goals are to:

- reduce the expected number of new cases of cancer among Canadians
- enhance the quality of life of those living with cancer
- lessen the likelihood of Canadians dying from cancer
- increase the effectiveness and efficiency of the cancer control domain (CPAC, 2008a).

1.1.4 The current cancer control environment

Building on evidence-based clinical practice guidelines, new techniques and procedures are being introduced along the entire continuum of cancer control. As a result, there is some blurring between phases. These range from:

- new programs for prevention and screening
- a revolution in diagnosis and pathology to robotic surgery
- new and more complex radiation treatments
- continuously evolving and costly systemic therapies.

These successes are a mixed blessing. More and more people are needed to care for patients who are living longer with cancer. This takes more complex and longer management of survivors in the community to provide systemic therapy and supportive, rehabilitative and palliative care closer to, or in, patients' homes.

The combined impact of these trends is creating a "perfect storm" for the cancer control workforce. Pathology is one of the early casualties. During the first six months of 2008, headlines on the front pages of major newspapers across Canada focused public attention on various

incidents of inaccurate pathology diagnoses and their negative impact on Canadians' confidence in and expectations for high standards for their cancer care. The same year, an editorial in the Canadian Medical Association Journal (CMAJ) said, "Critical issues in Canadian anatomic pathology have surfaced like a crashing wave" (Chorneyko et al., 2008). The net result is mounting strain on the cancer diagnostic system due to the increasing workload that pathologists and associated medical laboratory technologists face. Unlike the United States, Great Britain and Australasia, Canada lacks a national quality assurance program — Ontario and British Columbia have some programs in place. The CMAJ editorial pointed to the importance of quality assurance in understanding the underlying systemic issues such as "human resources issues, high workload pressures, pathologist fatigue and burnout, or a lack of resources for ongoing continuing professional development."

A concerted effort is needed on many fronts to ensure that Canadians have access to quality care. Ultimately, many players need to be involved in:

- working through new processes
- building in quality assurance
- developing the necessary training for all workers in the system to fulfill their responsibilities and optimize their scope of responsibilities.

1.1.5 Health human resources in cancer control

Health care is one of the world's most labour-intensive enterprises. Health human resources (HHR) are the foundation for the delivery of all cancer control, from prevention to palliation. Over the last 20 years, HHR shortages in the cancer control workforce have been constant, recurrent and widespread. These shortages have been noted in priority health professions including:

- oncologists (medical, radiation, paediatric and surgical), medical physicists, radiation therapists, and oncology pharmacists
- several categories that are not as well known such as oncology nurses, pathologists, oncology social workers and cancer epidemiologists.

Shortages in the cancer control workforce include longer wait times for important and essential services to prevent, diagnose, treat and support cancer patients — and frustration and dissatisfaction on the part of patients and cancer health professionals.

Without the development of a planned human resources strategy, the Canadian cancer system may not have the people it needs to provide cancer services. To address the health human resources concerns and crisis that Canada's cancer control system faces requires more information, evidence, research, innovation and strategizing. All provincial/territorial jurisdictions are developing planning and modelling approaches. However, there is no specific focus given to the cancer control workforce. The demand for cancer control human resources will persist well into the next several decades due to population growth and aging and the entry of Canada's boomer population into their 60s, the peak age of cancer incidence.

This *Cancer Workforce Scoping Study* (CWSS) was commissioned in mid-2007 through funding from the Public Health Agency of Canada and under the direction of the joint CAPCA/CPAC Human resources Action Group (HR-AG).

1.2 Purposes and Objectives

The original purposes of the *Cancer Workforce Scoping Study* were to gather information and synthesize knowledge to develop a research plan for a labour market study of the cancer control workforce and to prepare a situational analysis of the cancer control workforce. After the completion of the initial research for the project, and upon further direction from the Chair of the HR-AG, the project's purpose was revised to:

- synthesize knowledge from the literature and database scan
- complete a pan-Canadian situational analysis of the cancer control workforce
- provide information and recommendations that will lead to the development of a strategy for human resources in cancer control.

The intent of the CWSS's situational analysis and related documents is to provide much-needed information and suggest actions for stakeholder groups in cancer control.

The *objectives* of the CWSS are to:

- Identify the breadth of the health human resources workforce involved in meeting the needs of the population.
- Assess the body of knowledge and identify the sources of qualitative and quantitative data regarding health human resources developments within the cancer control workforce.

- Report on the information existing for the Canadian cancer control workforce and identify the gaps in the human resources data.
- Examine the available Canadian data and identify the gaps within the data and information pertaining to the roles and responsibilities, training and supply systems available, skill requirements, and interdisciplinary and trans-disciplinary relationships for the key occupations in the cancer control workforce.
- Identify the gaps and enablers in the current design of the Human resources Planning Information System (HR-PIS).
- Identify the human resources issues and challenges facing the Canadian cancer control workforce currently, in the immediate term (three to five years) and in the long-term (post-10 years).
- Describe the human resources environment for cancer care.
- Identify the implications for future research work in human resources for the cancer control workforce.
- Make recommendations for a strategy for human resources in cancer control.

This *Technical Report* integrates the results from a comprehensive review and assessment of the relevant literature and databases for the cancer control workforce with the findings from consultations with close to 200 participants across Canada. It builds upon a *Summary Report: Pan-Canadian Cancer Workforce Challenges and Issues* (Wortsman and Janowitz, 2008, unpublished report). This report is also called the "climate study." It is a qualitative "snapshot" of the overarching cancer human resources issues, trends and challenges and their implications for the cancer control workforce. The climate study was conducted simultaneously with the CWSS through interviews with high-level executives in the cancer control system.

Wortsman and Janowitz highlighted six major challenges for the cancer control workforce:

- shortages of clinical staff
- shortages of administrative and technical staff
- recruitment and retention
- effective utilization of the cancer control workforce through inter-professional teams
- increased funding of supportive care
- evidence-based human resources standards to provide cancer care.

This CWSS report summarizes the findings from the primary research. It is intended to provide knowledge about key issues that can inform

recommendations or directions for further research or areas for taking action now.

1.3 What You Will Find In This Report

This report has eight chapters, a list of acronyms, references and appendices.

The chapters cover the following information:

- Chapter 1 — Introduction (cancer care and cancer control in Canada, purposes and objectives of the study and structure of the technical report)
- Chapter 2 — Project Overview (approach and methodology)
- Chapter 3 — The Cancer Control Workforce Environment (covering who provides cancer control programs, trends, supply and demand, and challenges)
- Chapter 4 — Education and Training of the Cancer Control Workforce (covering educational requirements, trends and challenges)
- Chapter 5 — Employment Strategies for the Cancer Control Workforce (covering trends and challenges)
- Chapter 6 — Approaches to Service Delivery (covering current approaches, crosscutting themes underlying work re-organization and a summary of challenges)
- Chapter 7 — Summary of Findings with Recommendations
- Chapter 8 — Conclusion.

There is a list of Acronyms used in this report. The Reference section lists all the literature and databases that the CWSS reviewed.

Appendices A to I have details on the CWSS's methodologies.

In this report the acronym "CWSS" and the words "scoping study" are used in referring to the *Cancer Workforce Scoping Study*.

A *Summary Report* is available from the Canadian Partnership Against Cancer (CPAC). CPAC's contact information is at the end of this report.

Chapter 2 Project Overview

Approach

The Joint CAPCA-CPAC Cancer Workforce Scoping Study Steering Committee directed the CWSS study. The Steering Committee met in-person three times during the study period to review the results for each of the three study components:

- Component 1 — Develop comprehensive list of occupations involved in cancer control and start literature and key databases scanning.
- Component 2 — Conduct information gathering and synthesizing (information from key informants, literature searches for scientific and grey literature, assessment of key databases).
- Component 3 — Analyze data and information and prepare final reports.

Methodology

The principal methods to compile study data and information included:

- completion of a comprehensive review of the literature and databases
- 146 in-person and telephone interviews with survey respondents across the country
- site visits in five locations, including facility tours
- homogenous and heterogeneous focus groups.

Appendix A has more information on the methodologies, including the strategies for the literature search.

2.1 Occupations Under Study

Using a two-round Delphi,[3] the Steering Committee selected 10 occupations from an identified list of 82 occupations in cancer control for further investigation in the CWSS. Appendix B outlines the process and the tools that the study used to reach consensus on the occupations for further study.

3 For a short introduction to the Delphi technique (Dunham, 1996), see http://www.medsch.wisc.edu/adminmed/2002/orgbehav/delphi.pdf

Delphi participants were asked to consider the adequacy of the coverage of the cancer control continuum, emerging roles, coverage of the range of professional background in their selections and to provide a rationale for each occupation selected. The CWSS selected occupations are:

- family physician/general physician
- palliative care physician
- pathologist
- medical oncologist
- radiation oncologist
- surgical oncologist
- nurse practitioner
- registered nurse
- medical physicist
- radiation therapist.

2.2 Limitations

The CWSS was conducted to complete a pan-Canadian situational analysis of the cancer control workforce and to provide information and recommendations that will lead to the development of a strategy for human resources in cancer control. It is not a comprehensive pan-Canadian labour market analysis of the cancer control workforce. Because of the broad nature of the CWSS, its focus is to identify, document and prioritize the major issues, themes and opportunities for taking action now — and where there is a need for further, more in-depth investigation.

The CWSS concentrates on 10 occupations representative of the cancer control continuum. This small number may limit the applicability of some CWSS study findings to occupations that the study did not look at in-depth. In addition, data relevant to cancer control issues are not uniformly available for all occupations, due to the small numbers employed in some (e.g., radiation oncologist) or because the occupation primarily provides care to non-cancer patients (e.g., registered nurse).

The CWSS aimed to complete a broad comprehensive scan and review of the literature and databases. Literature searches, conducted primarily using Medline, may have missed relevant literature particularly in health care administration that is not included in Medline. Key informants were asked to identify relevant grey literature documents.

The inclusion of grey literature review and analysis was limited by the choice of respondents and their ability to identify and provide relevant documents.

Ability to generalize the results to all occupations and areas of Canada is limited due to the use of non-random sampling methods to select participants for interviews — the CWSS used a combination of quota and convenience methods. A random sample of participants was not possible given the time and budget of the study. Further, qualitative information that CWSS participants provided may represent their personal experiences and views. These may not be representative of the workforce at large. Still, the large number of people with whom CWSS consulted lends strength to the collective findings.

Finally, the CWSS is limited by the lack of input from the provincial and territorial ministries of health, despite the fact that the initial work plan included consultations with each ministry. This was partly due to the inability to link the CWSS with another, larger initiative outside the project that was taking place within the same timeframe. Future consideration should be given to obtaining input from the ministries of health to better understand each region's plans for cancer care within the overall health care system and the challenges they face in implementing these plans.

Chapter 3 The Cancer Control Workforce Environment

In this chapter, you will find a description of the cancer control workforce and the demographic trends and issues it faces:

- Key challenges include current and projected widespread shortages in most occupations. These shortages affect access to care and contribute to workforce stress, illness and absenteeism.
- The gaps in data and knowledge are highlighted along with areas where further data development and health services research approaches could contribute to more cohesive planning for the cancer control workforce.
- The results are based on key informant interviews and site visits in components two and three of the study, combined with issues that the literature scan identified and the compilation of published information from key data sets.
- Two key trends contribute to the human resources shortages:
  - a rising workload resulting from increases in new incident and prevalent cases of cancer, increased complexity of treatments

requiring more care over longer periods of time and increasing patient expectations

- *changing approaches to work-life balance* in the cancer control workforce.

3.1 Chapter Highlights

The crucial challenge to human resources planning for cancer care is how to manage workloads to provide high quality, technical, complex but compassionate care within wait time guarantees to the ever-increasing number of cancer patients. The key strategies to alleviate shortages discussed in subsequent chapters include:

- increasing the supply of workers through education and training
- implementing effective employment strategies such as recruitment, retention, remuneration and the use of international graduates
- deploying workers optimally by implementing effective approaches to service delivery, including new roles for workers
- managing the cancer control workforce through effective policy development and implementation at the national, provincial, program and facility level.

3.1.1 Cancer trends are increasing the demand for the cancer control workforce

The following trends result in greater demands on the cancer control workforce:

- The number of Canadians developing cancer continues to rise steadily each year, due in part to population growth and aging. Age-standardized incidence rates remain relatively stable among men, and are increasing slightly among women (Canadian Cancer Society, 2009).
- Treatment advances have improved survival rates, resulting in more people living with cancer and requiring follow-up care.
- Treatments are becoming more complex and time-consuming to deliver.

3.1.2 Quality of work life and the need for work-life balance influence workforce supply

- Increases or decreases in average weekly hours worked considerably affect the availability of cancer control care.

- Among physicians, gradual reductions in average weekly hours worked, occurring in all age groups and among both men and women, equates to a reduction in the effective supply of physicians.
- Workers in many other cancer control professions also work long hours. They, too, are gradually cutting back on the extra hours they work to achieve greater work-life balance. This trend increases workforce demand.
- Cancer control workers, like all health care providers, experience considerable stress on the job.
- In many settings, human resources shortages are addressed through working longer hours each week or by cutting back on break times or vacation. These practices can be counterproductive, leading to job dissatisfaction, burnout and increased absence due to illness.
- There is a need for protected time to balance clinical work with other duties including education, training, research, administration and management, and thereby help to reduce job stress.

3.1.3 Changing work environment

3.1.3.1 Technology and Informatics

- New technologies, equipment and systemic therapies are arriving in the workplace at a rapid pace. This places extra strain on the cancer system to develop, implement and maintain appropriate programs.
- Technology can greatly enhance the care provided to patients and contribute to improved patient outcomes. However, it can also increase the workload of various health care providers and create pressures on an already strained system to provide education and training.
- New technology leads to a greater need for quality control and assurance, to sub-specialization and to new ways to organize care (e.g., telehealth).
- Expert information systems can enhance communication among members of the large team of care providers for each patient. Combined with telehealth, this plays a critical role in supporting care in rural and remote centres.
- Clinical practice guidelines (CPGs) can govern more than decision-making for care. They can also be built into computer systems that guide radiation therapy or into software for pharmacists to dispense the appropriate dose of drug therapies.
- Enhanced and effective information systems and improved automation in the workplace should improve process efficiencies.

- Currently many health regions and hospitals across Canada are upgrading their paper-based health records into electronic health records (EHR). EHRs are expected to reduce retrieval and storage costs and reduce laboratory test duplication.
- Appropriate training, time for training and broad stakeholder consultation needs to be built into development and implementation plans to minimize workers' stress and frustration levels.

3.1.3.2 Increasing complexity and effectiveness of treatment

- Treatment advances are leading to better patient outcomes. This results in more cancer survivors requiring follow-up care.
- While the incidence of new cases is increasing at about 2 per cent per year, treatment advances are causing a multiplier effect to increase workload by 5 to 7 per cent per year (Personal Communication, 2008).
- The increased complexity of treatment is independently adding to workload demands across the cancer control continuum. This is particularly evident for pathology, radiation oncology and systemic therapy.

3.1.4 Who is providing cancer control services and what is the availability of planning data?

- An array of health care providers delivers cancer control programs — the CWSS identified 82 distinct occupations across the phases of the cancer control continuum.
- The CWSS chose ten distinct occupations for in-depth consideration: family physician, palliative care physician, pathologist, medical oncologist, radiation oncologist, surgical oncologist, oncology registered nurse, nurse practitioner, medical physicist and radiation therapist. Except for family physicians, nurses and nurse practitioners, cancer patients represent all, or the majority of the workload for these occupations.
- Canada collects and publishes considerable information on physicians and nurses. This provides good to excellent information on family physicians, pathologists, radiation oncologists and registered nurses.
- A new Canadian Institute for Health Information (CIHI) database on medical radiation technologists will include information on radiation therapists as of 2008.
- While some data are available for medical oncologists, palliative care physicians, oncology nurses and nurse practitioners, small numbers,

coding and tabulating practices often limit the analyses of trends or demographic patterns.

- Major gaps exist in data for surgical oncologists, where only anecdotal data are available, and for medical physicists, where information is sparse and incomplete.

3.1.5 Supply and demand

- The supply of cancer control workers is an important international concern. Canadian issues are similar to those that scientific literature for other countries such as Australia, the United States and the United Kingdom report.
- There is a need for workload ratios or human resources planning standards for pathologists, radiation oncologists, medical oncologists and medical physicists.
- For radiation oncologists, the benchmark percentage of cancer patients who should receive radiotherapy treatment needs to be determined. Canadian research shows regional variations in radiotherapy treatment. If all patients who could benefit from radiotherapy actually received it, workload demands for radiation team members could further increase.
- Needs-based statistical models should be developed to assess what is known and to forecast demand and supply into the future. A number of models reported for Canada and elsewhere provide insights into the most important factors that affect supply and demand for various occupational groups. There is a need for more work in Canada in this area, particularly for the smaller occupational groups that are critical to deliver cancer care (e.g., radiation oncologists, medical physicists, radiation therapists, medical oncologists) to complement the ongoing modelling work for physicians and nurses.

3.1.6 Key Challenges

3.1.6.1 Access to care

- One in 15 Canadians does not have access to a family physician. This lack of access affects the ability of Canadians to benefit from cancer prevention and screening programs, and receive appropriate follow-up and palliative care.
- Access to diagnostic services is limited: 56 per cent of family physicians and 40 per cent of other specialists rated access to advanced diagnostic services as fair to poor. Only 15 per cent of

anatomical pathologists can attend to a tissue diagnosis for an urgent case in one day.

3.1.6.2 Overtime and unpaid time are leading to stress, burnout and absenteeism

- The management, organization and delivery of services across cancer control and the deployment and use of resources affect the outcomes of the health care providers who deliver the care. Shortages are made worse if health care providers are too sick to work.
- Paid and unpaid overtime for nurses is increasing. Temporarily, this helps ease workforce shortages. However, this is a counterproductive strategy since increased stress and burnout contribute to higher than average absenteeism.
- Many CWSS respondents report that clinical demands have increased so much that cancer control providers no longer can find time on the job to fit in all of the training, research and administrative tasks that their jobs require.
- Results from the CWSS site visits and focus groups indicate a high level of commitment of many cancer workers to their jobs, their patients and their employers. Some are enthused by the many challenges they face. Other are clearly having difficulty coping.

3.1.6.3 Increasing patient expectations

- As treatments have become more complex and more options are available, cancer care providers need to spend more time discussing alternatives with patients.
- Patients have difficulty finding their way through the system. When there are appointment time mix-ups and necessary documentation for appointments is not available, this makes it worse.

3.1.6.4 Data and model development for cancer control workforce planning

- Canada is rapidly developing data sets for health human resources planning but there is relatively little available information. There has been even less modelling for the cancer control workforce. Key areas of opportunity are to:
  - Develop a plan to improve data availability, quality and comprehensiveness for the cancer control workforce.

- Conduct demographic and trend analysis using existing data sets to answer a key question: Which health care providers are available to provide cancer control services to patients?
- Develop and exploit linked data sets for analysis and health services research to answer questions such as: what services do physicians and nurses provide to their patients? Such data sets would benefit from unique provider ID numbers at the national level.
- To complement the clinical practice guidelines that inform care decisions at an individual patient level, there is a need for workload ratios for cancer care occupations to benchmark staffing levels to provide cancer services to populations.
- Develop a dynamic, population-based cancer control workforce-planning model for Canada linked, where feasible, with other HHR models.

3.2 The Cancer Control Workforce: who is providing cancer control programs to the Canadian population?

Cancer control programs are delivered by, what can seem to patients and their families as, an array of health care providers. The CWSS identified 82 distinct occupations. Most, when classified according to the cancer control continuum, contribute to more than one phase:

- 33 professions contribute to prevention.
- 51 contribute to screening and early detection.
- 51 more contribute to diagnosis and staging.
- 75 contribute to treatment.
- 65 contribute to supportive and rehabilitative care.
- 63 contribute to palliative care.

Figure 1 has representative occupations from each phase. It also presents occupations that support all phases through surveillance, research, education, management, co-ordination and leadership (see also Appendix C).

A typical Canadian may experience various cancer control programs and not be aware of the many cancer control experts working behind the scenes, for example:

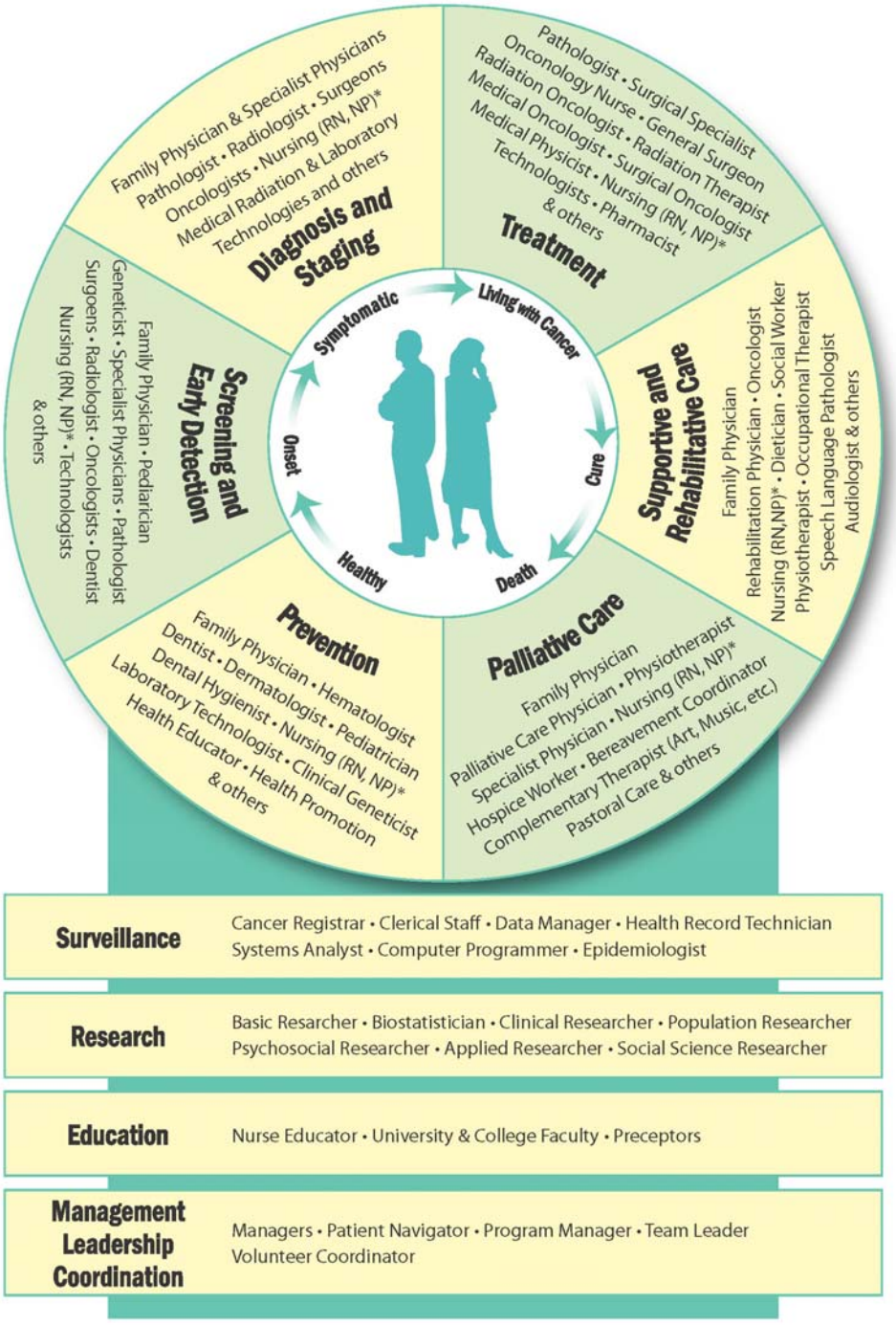
- Healthy Canadians may be more aware of health promotion counselling that family physicians, public health nurses or dieticians provide to encourage physical activity or healthy eating. They may

participate in physical fitness or smoking cessation programs that a variety of health providers staff.

- As part of a woman's regular visit, a family physician or nurse may take a cervical smear for analysis by a cytotechnologist in a laboratory many kilometres away.
- A woman aged 50 to 69 may go to a breast screening centre where she will meet a mammography technician. She may never see the radiologist who reads her mammogram to determine if it is normal or abnormal.
- During a physician visit to discuss a worrying symptom, a patient may be referred to a local laboratory where a medical laboratory technologist may take blood samples or to a radiology laboratory for X-rays or ultrasound that a medical radiation technologist takes. If suspicious results continue to be found, further investigations may involve CT scans, an MRI or nuclear medicine investigations — again involving specialized technologists and physicians.

Once a tumour is detected, a surgeon may take a biopsy, working very closely with nurses, an anaesthesiologist and pathologist and backed up by medical laboratory technologists to determine the presence or absence of cancer. A radiologist may be involved in isolating the tumour site through innovative imaging techniques. During the process to establish diagnosis, the patient may be referred to an oncologist and a supportive care team member such as a social worker or spiritual counsellor.

Figure 1 –
Representative Occupations Across The Cancer Control Continuum From A Patient Perspective



*RN — Registered Nurse; NP — Nurse Practitioner.

Note: For a complete list of all occupations in each phase, please see Appendix C.

Source: Adapted from Berman (personal communication).

Depending on the type of cancer, the surgeon will ideally consult with a radiation and medical oncologist to jointly plan the most effective therapy. Surgery may be the first treatment selected, on an inpatient or day surgery procedure. Following inpatient cancer surgery, and while the patient recovers on a hospital ward, an ever-changing team of registered nurses, specialized nurses and unregulated care aides/health providers will provide care. The patient may find it disorienting to deal with all of these care providers along with a social worker, physiotherapist, occupational therapist, the surgical specialist and a team of residents in a teaching hospital. Consequently, in some Canadian settings, a patient navigator may be available to help guide the patient through the various procedures and decision points.

When the protocols for treating the cancer involve radiation and systemic therapy, the radiation oncologist and residents, and the medical oncologist and residents will see the patient for treatment planning. Generally, these treatments will be provided on an outpatient basis and involve repeated visits to the treatment centre over weeks, months or even years.

In the radiation therapy suite, a medical physicist (possibly working with a dosimetrist or physics assistant) will plan the patient's treatment. The radiation therapist, supported by oncology nurses, will deliver the treatment.

Systemic therapy will also generally be provided on an outpatient basis. An oncology nurse will oversee it. A pharmacist and pharmacy technician will prepare the drugs. In some areas of Canada, after the initial course of therapy in the cancer centre, the patient will be referred back to a community-based program. Supportive care may continue to be available to the patient throughout treatment. The treatment process for some cancers may extend for a year or more.

If the treatment is successful, the patient will be referred back to their family physician in the community for follow-up care. For some patients, the cancer may recur, requiring further treatment cycles. As pain and symptoms appear, the patient may be referred to the palliative care team, including specialist palliative care physicians and nurses and a wide range of supportive care professionals and, ultimately, a bereavement co-ordinator.

3.3 Trends Affecting the Cancer Control Workforce

This section explores how the increasing cancer burden contributes to the persistent and widespread shortages affecting the cancer control workforce. It then considers what demographic and other information is available for cancer control workforce planning.

3.3.1 Population demands

Canadian Cancer Statistics (Canadian Cancer Society, 2009) annually publishes current estimates of cancer incidence and mortality. The reported number of new cancers has more than tripled over the past four decades. It is estimated at 171,000 in 2009 from 49,600 in 1969. Each year, about 3,000 more Canadians are diagnosed with cancer and require care. The numbers of new cases and deaths continue to rise steadily due to population growth and aging. The overall incidence rates for men have stabilized over the past 10 years. Women have posted a slight, significant increase of +0.4 per cent on average each year[4]. By contrast, mortality has declined among both males (-1.3 per cent per year) and females (-0.4 per cent per year). The lowering of mortality rates combined with population growth has resulted in increased prevalence of cancer (Canadian Cancer Society, 2009).

New cases are not the only factor driving demand for Canada's cancer control workforce. Due to treatment advances and other interventions leading to lower mortality rates, more and more patients are living longer. As of 2005, an estimated 695,000 Canadians were alive, having lived up to 10 years following their cancer diagnosis. This figure is close to double that of the estimated 413,600 living at least 10 years in 1990. Many of these Canadians require ongoing care. This may include systemic therapy, supportive and rehabilitative care, follow-up care or palliative care (Canadian Cancer Society, 2009).

3.3.2 Changing demographics of the cancer control workforce

A necessary first step to effectively plan for the cancer control workforce is having descriptive data on the numbers and demographic characteristics of the workers providing care to cancer patients. This section provides summary information available for the 10 selected occupations. It then describes in more detail the available demographic information for physicians, nurses, and other health professionals. Where necessary, there is supplemental data for the overall health workforce.

4 The changes in trends are measured as the Average Annual Percent Change (Canadian Cancer Society, 2009).

3.3.2.1 Data availability

The lack of data, on even the basic numbers of workers in key cancer control occupations, is a major obstacle for pan-Canadian planning. As Table 1 shows, there are many gaps in the basic information on the number of workers in the 10 selected occupations. The numbers that do appear generally reflect people who are registered with a professional organization. They may or may not be working in their profession. Nursing data are the exception. They include only those employed in nursing. For all occupations, these numbers will differ from full-time equivalent (FTE) workers, as some health care providers work part-time — this factor is not accounted for in the figures presented in the table.

For most physician and oncology specialties, data are available for 2009. They represent the number of physicians in those specialties who are resident in Canada and registered on the Canadian Medical Association (CMA) Master File. However, these counts do not represent full-time physicians as they include older physicians who may be semi-retired and others who may be temporarily inactive. Further, no data are available for palliative care physicians and surgical oncologists — two specialties with small numbers that the CMA Master File does not track.

Data from the Registered Nurses Data Base provided accurate accounts for 2006 for nurses employed in nursing occupations and for the relatively small numbers of nurse practitioners and nurses working in oncology. The Canadian Nurses Association's certification database provides information on RNs certified in oncology. The CIHI annually collects nursing data in collaboration with the Canadian Nursing Association. The data include considerable additional information on age, sex, education, geography and area of specialization, and other topics. The RN Data Base at CIHI stores and manages specific nursing data that regulatory bodies collect annually.

For the two remaining occupations, medical physics and radiation therapists, there are very limited data. For medical physics, the number of active registered medical physicists is reported to CIHI each year. However, membership is voluntary. All medical physicists may not be counted. The counts for radiation therapists (RTs) are underestimates as they exclude RTs in Québec and parts of Ontario. Further, they represent the numbers of workers registered annually with the Canadian Association of Medical Radiation Technologists and registrants may not be working full-time or working at all. However, a new CIHI database on medical radiation technologists will include information on radiation therapists as of 2008.

Table 1 —
Estimated counts* for 10 Selected Occupations of the Cancer Workforce Scoping Study, Canada

Occupation	Year	Approx Number	Oncology focus of profession	Availability of data for cancer control workforce planning
Physicians				
Family physician	2009	34,403	5% or more	***
Palliative care		200 - 300	70 to 80%	*
Pathologist	2009	1205	60-75%	**
Radiation oncologist	2009	395	>95%	***
Medical oncologist	2009	407	>95%	**
Surgical oncologist		<100?	>95%	*
All surgical specialists	2009	8553	10 - 15%	**
Nurses				
Registered Nurses - all	2008	261,889	unknown	***
RNs certified in oncology	2008	1,360	>90%	**
RNs working in oncology	2008	3,351	>90%	**
Nurse Practitioners	2008	1,626	<5%	**
Other professionals				
Radiation Therapists	2008 est.	1,892	>95%	*
Medical Radiation Therapist	2008	16,915	unknown	**
Medical Physicists	2006	322	>90%	*

Source: Cancer Workforce Scoping Study, 2008.

*The estimated counts were retrieved from the following data sources:
Data for family physicians, pathologists, radiation and medical oncologists, and surgical specialists represent the number of physicians resident in Canada as included in the CMA Master File as of January 2008 (CMA, 2009). Estimates for numbers of palliative care and surgical oncologists are based on estimates provided by CWSS respondents. Pathologists include four laboratory specialist sub-groups: anatomical; general/clinical, haematological and neuropathology.

Estimates of time allocation on oncology for family physician and pathologists are based on CWSS respondents. Estimates for palliative care physicians are based on cancer patients being about 80 per cent of all palliative care patients (Gaudette et al., 2002). Estimates for surgical specialists are based on limited data from CIHI, which indicates about 29 per cent of priority surgeries and 6 per cent of non-priority surgeries were for cancer (CIHI, 2008b).

Nursing data are supplied from the Registered Nurses Database: (CIHI, 2009) (CIHI, 2007e). Specific figures for all RNs represent those employed in nursing (Table 1); RNs working in oncology (Table 12) and Licensed Nurse Practitioners (Table 16). Data on RNs with valid CNA certification in oncology is provided by the Canadian Nurses Association's certification database (Canadian Nurses Association).

For Radiation Therapists, the Canada estimate is compiled from CIHI for all jurisdictions except for NS, PEI, and SK where CAMRT memberships are used (CAMRT, 2009). Data for Medical Radiation Therapists are reported as of August 1, 2008 (CIHI, 2010). Medical physicist data are supplied to CIHI by the Canadian Organization of Medical Physicists (COMP) and represent voluntary membership data (mandatory registration is not a condition of employment) (CIHI, 2008a).

For most of the 10 occupations in the CWSS, all or nearly all of their workload involves cancer patients. Based on reports from the study's consultations, cancer accounts for about 70 to 80 per cent of palliative care physicians' and pathologists' workload. However, for nurses, nurse practitioners and family physicians there are major information gaps on the proportion of their workload that involves cancer control activities. The most recent results from the 2007 National Physician Survey are starting to shed some light on this issue.

Based on a comprehensive review of national databases for the various occupational groups (see Appendix D), an attempt is made to assess the overall usefulness of data available for cancer control workforce planning for the 10 selected occupations[5]. In summary, the overview data for these 10 occupations illustrate the variety of limitations on the availability and usefulness of data to plan for the cancer control workforce. The many gaps (even for these 10 occupations) demonstrate the near impossibility of determining the total number of health care providers involved in providing cancer control services, a number that would be very useful for cancer control workforce planning.

3.3.2.2 Physicians

Data availability: The medical profession is one of the best-documented provider groups at the national and provincial/territorial levels within Canada. However, a number of gaps and inconsistencies occur across the various data sets. This requires careful attention and planning to fully use and interpret data. The Canadian Medical Association (CMA), the College of Family Physicians of Canada (CFPC) and the Canadian Institute for Health Information (CIHI) maintain data holdings for physicians. Appendix D has a more detailed discussion of the data available for physicians. Six of the 10 selected occupations for the CWSS are physician specialties. Data are readily available for family physicians. This is the largest group. It includes both family practice specialists and general practitioners.

Publications often present data for radiation and medical oncologists by medical specialty, although medical oncology can be included with internal medicine. Pathology is included in laboratory medicine. Therefore, it is usually reported according to one of the six sub-specialties or together with all laboratory specialists. The CWSS combines data analysis for four of the relevant sub-specialties.

5 In Table 1, the following criteria and categories were used: * very limited or no data, at most basic counts by age and sex; **somewhat limited: due to small numbers, some variables such as education and geography are available, but lack of understanding of cancer workload; ***good data available, but may lack understanding of cancer services provided, or may be limited in another data attribute.

Palliative care is a comparatively new specialty, as of 1999. It has relatively small numbers and many data sets do not track this group. The one exception is CAPER,[6] for education and residency positions. There is no separate tracking of surgical oncologists as a specialty in Canada. Surgical specialists such as neurosurgeons and thoracic surgeons and general surgeons perform most cancer surgery.

Trends: As of January 2009, there were 66,992 physicians in Canada. There were slightly more family physicians (34,403) than specialists (32,562) (CMA, 2009). In Canada, the number of physicians per 100,000 population fluctuated between 1986 and 2008:

- From 1986 and 1993, the rate increased from 174 to a high of 191 per 100,000.
- From 1993 and 1997, the rate dropped to 183 per 100,000.
- From 1998 to 2008 the rate increased steadily to 195 per 100,000.

The number of family physicians per 100,000 showed similar trends:

- In 1993, the rate of family physicians peaked at 102 per 100,000 population.
- From 1993 to 1997, the rate declined to 93 per 100,000.
- By 2004, the rate rose to 98 per 100,000 population. It remained stable to 2006 and then increased further to 101 per 100,000 in 2008.

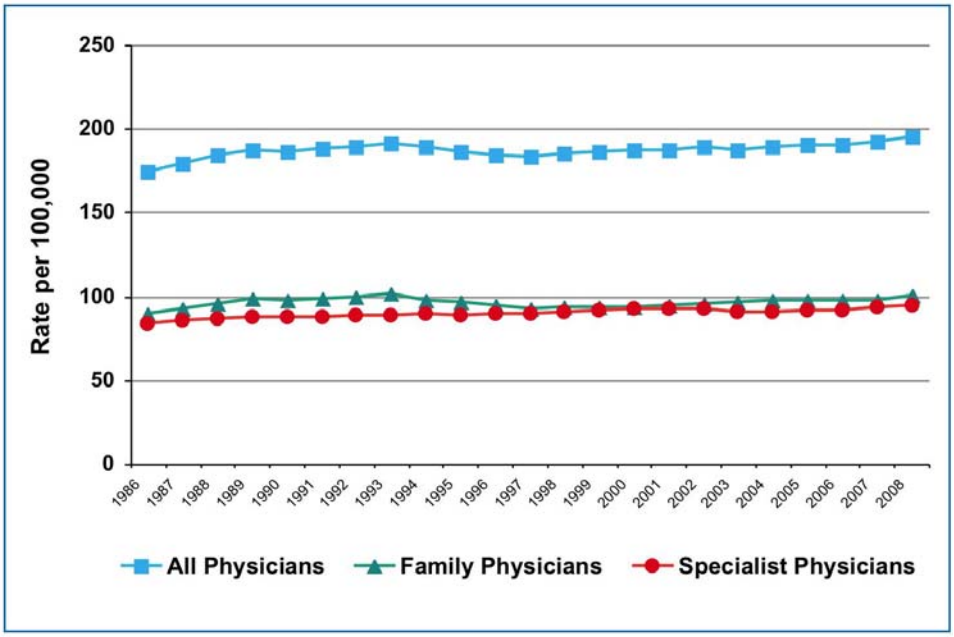
There was less variation in the trends for specialist physicians. The rate rose slowly and relatively steadily from 84 per 100,000 in 1986, to 90 in 1994 and, finally, to 95 in 2008. Family physicians slightly outnumbered specialists throughout the 20-year period. The gap ranged between 1 and 13 per 100,000. Currently there are 6 more family physicians than specialists per 100,000 population (see Figure 2).

More women are graduating from medical school, increasing the ratio of female to male physicians. In 2009, women accounted for 38.5 per cent of family physicians and 29.2 per cent of all specialists. For selected cancer-related specialties, women represented:

- 39.6 per cent of medical oncologists
- 54.1 per cent of medical geneticists
- 30.9 per cent of radiation oncologists
- 35.7 per cent of laboratory specialists (who are mostly in pathology)
- 20.0 per cent of surgeons, with obstetrics/gynaecology being an exception at 45.2 per cent(CMA, 2008) (CMA, 2009).

6 CAPER: Canadian Physicians Education Registry

Figure 2 –
All Physicians and Family and Specialist Physicians per 100,000 Population, Canada 1986-2008



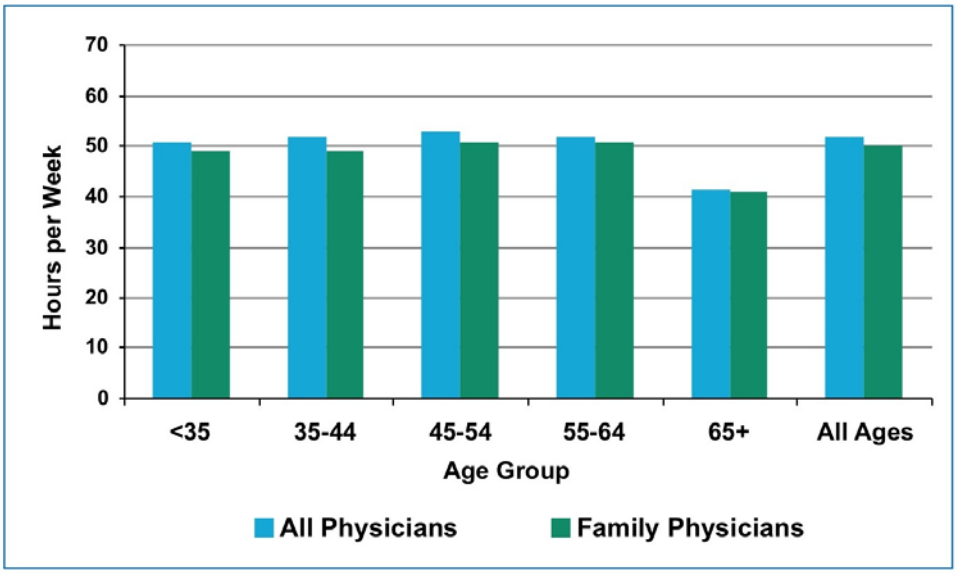
Source: Supply, Distribution and Migration of Canadian Physicians, 1986-2008; Southam Medical Database, Canadian Institute for Health Information 1986-2004; Scott's Medical Database, Canadian Institute for Health Information 2005-2008.

In recent years, there has been close monitoring of the gender ratio of the physician workforce, as female physicians have been reported to work 21 per cent fewer hours than males (Canadian Labour and Business Centre & Canadian Policy Research Networks, 2005; Chan, 2002). An analysis of 2001 survey data for the College of Family Physicians found that the gap in hours worked for male and female physicians was smallest for those aged under 30 and 50 + and widest for the 35 to 44 age groups, as women strive for work-life balance during their child-bearing years (CIHI, 2007a). Overall, the trend to reduced numbers of hours worked weekly has been interpreted as contributing to a decrease in the effective supply of physicians. This is partially attributed to the increasing numbers of women entering the medical profession.

However, more recent reports indicate that the average weekly hours worked has declined for both men and women. This started as early as the mid-1980s (Anonymous, 2007-2008). New data from the 2007 NPS on average weekly hours worked (not including on call duties) show some narrowing of the gap:

- Compared to male physicians, all female physicians work 14 per cent fewer hours (48 vs. 52 hours) and 12 per cent fewer hours in family practice (45 vs. 50 hours) (Figure 3).
- There is little variation in the average number of weekly hours worked by age groups from under 30 up to 64 years, at around 51 to 54 hours per week for all physicians (including specialists), and 49 to 51 hours per week for family physicians (Figure 4) (NPS Editorial Team, 2008).

Figure 3 –
Average Weekly Hours (Excluding On Call) Worked By Age Group, All Physicians and Family Physicians, Canada 2007

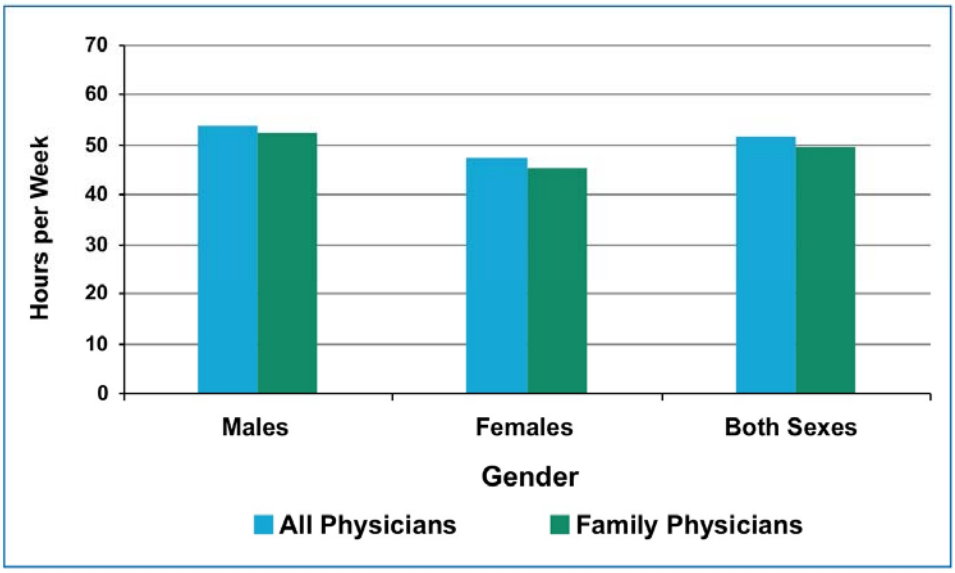


Source: National Physician Survey, 2007.

In contrast, selected specialties report considerably higher average weekly hours. These include medical oncologists (58 hours), medical geneticists (58 hours), radiation oncologists (55 hours) and laboratory specialists, including pathologists (50 hours):

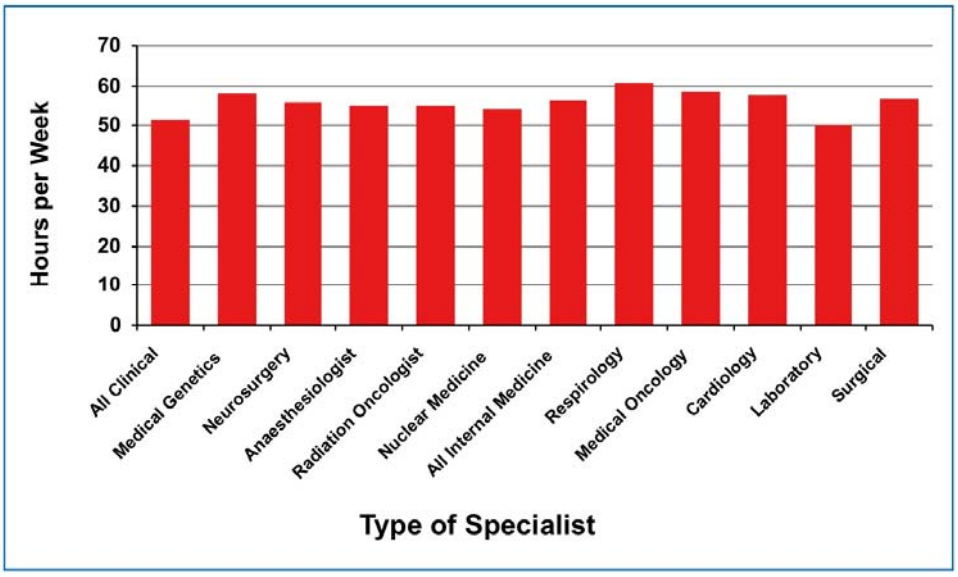
- Medical oncologists reported the second highest weekly hours of all internal medical specialties.
- Radiation oncologists ranked fourth in clinical specialties, working over 2 hours per week more than the average clinical specialist (Figure 5) (NPS Editorial Team, 2008).

Figure 4 –
Average Weekly Hours (Excluding On Call) Worked By Sex, All Physicians and Family Physicians, Canada 2007



Source: National Physician Survey, 2007.

Figure 5 –
Average Weekly Hours (Excluding On Call) Worked For Selected Specialist Physicians, Canada 2007



Source: National Physician Survey, 2007.

The impact of upcoming retirements is also a concern. The 2007 NPS data show that 6 per cent of family physicians plan to retire from clinical practice in the next two years. Also, 33 per cent of family physicians are age 55 or older (NPS Editorial Team, 2008; NPS, 2008). However, one analysis of trends since 1999 found that not as many physicians as expected are retiring — contributing factors are the financial need to keep working or the difficulty in finding a replacement (Anonymous, 2007-2008).

Family physicians report four major reasons for the increase in demand for their time:

- increasing complexity of patient caseload (84 per cent)
- management of patients with chronic diseases/conditions (82 per cent)
- aging patient population (80 per cent)
- increasing patient expectations (75 per cent) (CFPC, RCPSC, & CMA, 2008).

Family physicians are gradually introducing computerized systems into their practice. Nearly all (89 per cent) used at least one electronic aid, including, among others:

- electronic billing (58 per cent)
- online access to journals (56 per cent)
- e-mail (52 per cent)
- electronic patient appointment system (49 per cent)
- electronic interfaces to external laboratory/diagnostic imaging (30 per cent)
- electronic records to enter and retrieve clinical patient notes (25 per cent)
- telehealth (17 per cent) (CFPC et al., 2008).

3.3.2.3 Nurses

Data availability: There is considerable information available for the regulated nursing workforce. This includes registered nurses (RNs), licensed practical nurses (LPNs) and registered practical nurses (RPNs). The published information for the much smaller numbers of oncology nurses and nurse practitioners is more limited. CIHI maintains additional nursing databases on LPNs and RPNs. However, there is only limited information on oncology available in the LPN database and oncology is not an available option on the RPN. Appendix D has more information about the nursing workforce databases.

Trends:

- Overall, there was a steady increase of about 50 per cent in the number of RNs employed in nursing in Canada from 1980 to 1993. From 1993 to 2002, the number of employed nurses declined slightly and then levelled off (CIHI, 2007e).
- Between 2003 and 2008, the number of RNs employed in nursing rose by 8.5 per cent from 241,342 to 261,889. In each of these years, approximately 2,500 to 3,000 RNs were actively seeking work, while a further 14,000 were either not seeking work or did not state their employment status (CIHI, 2009).
- In 2008, most RNs were female (94.0 per cent).
- The average age of the RN workforce increased from 44.5 to 45.1 years between 2003 and 2008, with 23.3 per cent of RNs being 55 years and over in 2008 (CIHI, 2009).
- In 2007, the average age of nurses working in oncology was 41.3 years, with 90.5 per cent female and 16.7 per cent aged 55 years and over (Canadian Nurses Association).
- Most Canadian RNs were educated in Canada (91.6 per cent), with international graduates accounting for 8.4 per cent.
- The highest proportion of international graduates was in Ontario (12.3 per cent) and British Columbia (15.8 per cent) (CIHI, 2009).

During the past five years, the proportion of RNs employed full-time increased somewhat from 54.7 per cent in 2004 and up to 58.1 per cent in 2008. Part-time employment decreased from 34.0 per cent in 2003 to 31.0 per cent in 2008. Casual employment for RNs remained relatively constant at about 11 per cent throughout the five-year period. Notably, the proportion of RNs with full-time employment ranged from a low of 40.7 per cent in Alberta to a high of 73.9 in Newfoundland (CIHI, 2009).

Most RNs work in hospitals (62.7 per cent), followed by community settings (14.2 per cent), nursing and long-term care homes (10.1 per cent), with the rest working in other settings. Nurses working in oncology are more likely to be in hospital settings (77.5 per cent) (Canadian Nurses Association).

Trends in the nursing workforce include the introduction of new licensed occupations. These include nurse practitioners and advanced practice nurses, and the introduction of programs for certification of nursing specialties in oncology and hospice palliative care. Tracking of nurse practitioners (NP) began in 2003, when CIHI initiated collection of data for this group. Trends include:

- The number of licensed NPs increased from 725 in 2003 to 1,574 in 2008. Except for the Yukon, all provinces and territories license NPs (CIHI, 2009).
- While just 14 NPs worked in direct care in oncology in 2008, NPs do work in other areas of the cancer control continuum.
- The number of RNs with valid oncology certification rose to 1,360 in 2008 while another 1,247 nurses possessed a valid hospice palliative care certificate (CIHI, 2009).
- In 2008, 3,351 registered nurses (1.3 per cent) reported working in oncology direct care, more than double the 1,360 RNs with an oncology certificate (CIHI, 2009).
- Many nurses provide care for cancer patients in medical or surgical wards or in home and community care settings but there is not an explicit definition of the contribution that these nurses make to overall cancer control. Nurses working in public health and health promotion, family practice, and homecare may also provide cancer control services ranging from prevention through palliative care.
- While relatively few nurses work in oncology, workforce profiles on the CNA website provide information on age, sex, education, employment status and place of employment (Canadian Nurses Association). Further, as more nurses obtain this qualification, there will be an increase in the available numbers for reporting and analysis.

An analysis of the changing employment trends in two regulated nursing professions (RNs and LPNs) compared to unregulated workers demonstrates the potential for generating information using data from several surveys, including Statistics Canada's monthly Labour Force Survey and the longitudinal Survey of Income and Labour Dynamics. For example:

- Between 1987 and 2003, employment for unregulated workers more than doubled while RNs' employment increased by just 17 per cent.
- 7 per cent of employed nurses were graduates of a foreign nursing program.
- Overall, 21 per cent of patient care workers were unregulated in 1987. This jumped to 39 per cent in 2003.

Employment settings for patient care workers also changed between 1987 and 2003, most notably:

- The proportion working in hospitals dropped from 71 to 55 per cent.
- In nursing care facilities, the proportion increased from 22 to 32 per cent.

- In home health, the proportion of patient care workers rose from 2 to 7 per cent.
- Other ambulatory care settings accounted for about 5 per cent of patient care worker employment in all years (Pyper, 2004).

3 3.2.4 Other selected cancer control occupations

The CIHI health professionals' database provides very basic supply-side data for various occupations. It identified medical physicists (CIHI, 2008a). Data are limited in that only voluntary membership data are available for this group, so the number of 322 medical physicists in the workforce may well under-represent the actual number. The ratio of men to women in 2004 was 77 to 23. There is no published information on age distribution. While most medical physicists work in cancer treatment facilities, others may work in hospital diagnostic imaging and research facilities. Others work in universities, government and industry.

Limited data are currently available for radiation therapists. However, considerable improvement is underway with the publication of data from a new CIHI database for all medical radiation technologists (MRTs) that came on stream for the 2008 data year (CIHI, 2010). As of August 1, 2008, CIHI reports 16,915 registered MRTs were working (and not on leave) in medical radiation technology in Canada. However, the actual number may well be higher— British Columbia and the three territories neither regulate nor require mandatory registration. MRTs are predominantly female (81.7 per cent). The average age ranged from 39 to 44 years, depending upon the province or territory. The majority of MRTs worked full-time in 2008 ranging from 64 per cent in Manitoba up to 93 per cent in Newfoundland and Labrador. Most MRTs worked in hospital settings, ranging from 55 per cent in Alberta up to 95 per cent in New Brunswick. Other reported work settings include community health centres, cancer care and freestanding imaging clinics.

The data are more limited for the subset of MRTs that are radiation therapy technologists (RTTs). Not all provinces report data on RTTs (as a subset of MRTs) to CIHI. The study's best available estimate of the number of radiation therapists is compiled by merging membership data from CAMRT with that from CIHI for an estimated total of 1,892 in 2008 (CAMRT, 2009; CIHI, 2010). Based on earlier data, RTTs have a somewhat younger age distribution — only 20 per cent are 45 years of age or older compared with 36 per cent for all MRTs. The gender breakdown of RTTs is 80 per female and 20 per cent male (CAMRT, 2006).

Data availability for MRTs is generally good as this occupational group has a dedicated 4-digit code in Statistics Canada's Standard Occupational Classification. Thus, some information is available from the Canadian government databases including the Census of Canada (2001 and 2006) and the monthly Labour Force Survey on employment patterns and numbers. The Canadian Community Health Survey (CCHS) identifies MRTs. The CCHS is a large sample, cross-sectional survey. It collects information related to health status, health care utilization and health determinants for a large sample of the Canadian population.

3.3.3 Changing work environment

3.3.3.1 Technology

New *technologies, equipment and systemic therapies* are arriving in the workplace at a rapid pace. They place extra strain on the system to develop, implement and maintain appropriate programs. Technology has greatly enhanced patient care. It has also increased the workload and time demands on various health care providers. This creates pressures on an already strained system to provide education and training.

Technology advances mean a greater need for quality control and assurance. This is the responsibility of the medical physicists who conduct testing and maintenance on the radiation equipment to assure adherence to quality standards. With the introduction of new techniques, there is a need for additional training for radiation therapists and more policies and procedures.

Technological changes also affect medical physics. Several CWSS respondents said that medical physicists are becoming more and more like project managers. They must focus on process, quality assurance and implementation of new technologies and software. This includes the need to train staff. Another medical physicist commented that the role of the physicist is expanding as other areas of cancer care incorporate technology. These include medical imaging, robotic surgery and some aspects of systemic therapy (e.g., image guided stem cell placement).

There were concerns that with the increasing technological advances, radiation oncologists are becoming more technical and sub-specialized, and their focus is narrowing. This is an issue for small- and medium-sized centres without a large complement and that need radiation oncologists to be less narrowly focused. It is less of an issue for larger centres where there are more radiation oncologists on staff.

Telehealth is playing an increasingly important role in providing cancer control services and provider education to rural and remote communities. Use of this and other innovative technologies raise two key issues: the need to ensure the provision of proper training and education to the health care providers responsible for care delivery through this mechanism, and appropriate process design. Many CWSS respondent workers welcomed telehealth — although some found it too impersonal for initial consultations. "Telehealth is an advantage as the nurse is with [the] patient during the consult with the oncologist, and can review and clarify information with the patient and family following the consult."

3.3.3.2 Informatics and communication

Good information systems can enhance communication among the large team of care providers for each patient. Expert and effective information systems play a critical role in supporting care. Clinical practice guidelines could be built into computer systems to guide radiation therapy, or into software for pharmacists to dispense the appropriate dose of drug therapies. There are expectations that enhancing information systems and improving automation in the workplace should improve the efficiency of processes, especially administrative ones. To minimize the level of worker stress and frustration, it is essential for implementation plans to include appropriate training — and the time to deliver and take the training.

Health regions and hospitals across Canada are investing billions of dollars into technology (Pooley, 2006). Many are upgrading their paper-based health records systems into new electronic health records (EHR). The Canada Health Infoway predicts that by 2010, 50 per cent of Canadians will have their electronic health record available to their authorized health care professionals. This will make it possible for physicians to instantly access health records and make more informed diagnostics. Patient wait times will also be reduced, a key Canadian government priority (Health Canada, 2007a).

Pooley cites the achievement of a number of tangible benefits due to EHRs, including:

- hundreds of thousands of dollars of cost savings by reducing paper health-record retrieval and storage costs
- reduction of expensive laboratory tests
- online alerts that reduce adverse medical events (e.g., complications due to mismanagement of a patient's condition).

The Canadian government anticipates that the benefits of a pan-Canadian EHR system will include:

- Canadians not having to repeat their health history to every provider along their journey
- increased patient safety due to speeding up the diagnosis and treatment needs because of faster and better information
- public health professions better equipped to respond to emerging health crises by having information readily available and accessible
- reduced health care system costs due to fewer duplicated laboratory and clinical tests (Health Canada, 2007a).

Implementation of EHR is underway across Canada. All jurisdictions have some components of the information structure in place. For example, Prince Edward Island has implemented EHR for doctors' offices, hospitals and pharmacies. Québec is planning for province-wide EHR by 2011 with British Columbia and Alberta planning for province-wide EHR in 2009 and 2008, respectively.

The combination of EHR and telehealth can enhance team communications. All team members (with and across institutions) can keep up-to-date on patient progress, test results, pathology or digital scans. However, implementation is uneven across various parts of the health system. The cancer control workforce is dealing with systems in transition between paper and electronic. The process is not without growing pains. As one radiation therapy manager said, "I've just realized we are implementing our new paperless system this week with no dedicated IT support!"

Not all cancer centres and hospitals are using EHR. In some cases, there is inconsistent use among health care providers. Some health care providers said that EHR creates extra work to track down the information needed for data entry: "It's taking me a lot of time to enter and find information."

By helping to organize documentation, the EHR may help to reduce inefficiencies in the system such as improving scheduling errors and the availability of patient information:

> "We have lots of appointment booking errors with patients arriving at the wrong time."
>
> "We need to have all the pieces together (i.e., laboratory reports, pathology) before seeing the patient here. Right now we are pushing the wait times but patients are seeing the physician with no pathology."

Like any new technology, EHR implementation needs to be done with care. A CMAJ editorial observed that fragmentation of the patient record across numerous files in different places creates issues for patient safety. It concluded that the electronic record was needed to restore coherence (Flegel et al., 2008). However, in response to this editorial, a letter pointed out that the EHR can suffer from information overload and recommended considering the needs of all stakeholders (Viner & Parush, 2008).

A research group at the University of Ottawa has analyzed telemedicine and information and communication technologies (ICT) from a communications perspective. These researchers question "whether the economic logic driving the expansion of ICT-based outpatient care is compatible with the provision of high-quality patient care" (Bonneville & Pare, 2006). There is a further argument that technological innovation too often rests on technical-economic logic, and that organizations should integrate a medical-integrative logic involving a collaborative model among all interested parties. These parties would include health professionals, managers, engineers and computer experts (Bonneville & Grosjean, 2007).

3.4 Supply and Demand For Cancer Control Workforce Planning

3.4.1 Overview

Provincial or international boundaries do not constrain Canada's cancer control workforce. Due to widespread shortages for highly qualified health care providers, including those in cancer control, the supply of workers is an important international issue. For this reason and due to health system similarities, the CWSS included Australia, New Zealand, the United Kingdom and the United States in the literature search. This section of the report places Canadian work in the context of international efforts. It describes the approaches to cancer control planning, highlighting the dynamic interchange between supply and demand and the many issues facing the cancer control workforce.

Despite repeated literature searches from various approaches, the literature review found only two articles that related to surgical oncologists and discussed health human resources issues specifically for cancer surgery — although, indirectly, some of the work in the United Kingdom would involve specialist surgeons. The CWSS found limited information on palliative care physicians, pathologists or medical physicists, although pathology issues were well documented in a recent editorial (Chorneyko et al., 2008).

The published literature has several supply and demand models, with some Canadian work. The three main forecasting approaches (CIHI, 2007a) are:

- *Supply-based*, the simplest approach, relies on current provider-population ratios and demographic projections.
- *Utilization-based* adds patterns of service delivery and health service utilization rates to supply side models.
- *Needs-based* is the most complex. It determines how many resources are required to deliver services for expected population needs, by also including disease incidence and prevalence rates and population indicators of health

There is a need for more Canadian work on this, particularly to incorporate oncology workforce requirements into planning models for all health care providers. For some occupations, there are statistical supply and demand models to forecast future needs. This section presents selected models to illustrate various approaches. Please note that these models are not the only ones developed in Canada for health human resources forecasting.

3.4.2 International trends

The United Kingdom is developing human resources requirements to meet National Cancer Plan standards. These were put in place to deal with poor survival rates there, compared with other European countries. As a result, the National Health Services (NHS) proposed creating 1,000 new cancer consultation posts in pathology, radiology, oncology, haematology and palliative care. There were initial concerns about where to find the new staff, as not enough people were being trained. The National Cancer Plan also included the creation of a national cancer research institute (Ferriman, 2000). The report *Tackling Cancer in England; Saving More Lives* documents the ongoing struggle in England to improve survival rates (Cannell, 2005). Even with central planning from NHS and large budget increases (2 billion pounds since the National Cancer Plan of 2000) staff shortages, including cancer specialists, persist — resulting in wait time targets not being met. Still, a comprehensive report documents considerable progress towards achieving the goals (Griffith & Turner, 2004).

Relatively few articles in the medical literature examine the relationships between physician supply and patient outcomes. One study in the United States found no relation between increasing physician supply and decreased odds of late-stage breast cancer. It *did* find a relation with increased odds of early stage breast cancer (Ferrante, Gonzalez, Pal, & Roetzheim, 2000). Another US study found a relation

between increasing physician supply and the decreasing odds of late-stage diagnosis of colorectal cancer (Roetzheim et al., 1999).

3.4.3 Radiation oncologists

The published literature in Australia, the United States and, to some extent, in the United Kingdom, documents very well the supply issues for radiation oncology. Notably, in these countries the whole radiation therapy team is included in the supply and demand analysis. By contrast, in Canada, while the Canadian Association of Radiation Oncology (CARO) does a thorough job of predicting demand for radiation oncologists for internal use, it does not include team members such as radiation therapists, medical physicists and others. There have been Canadian attempts to develop information on supply and demand for the radiation therapy team but none has been fully successful. In 2005, the CSCC sponsored the development of a predictive staffing model for radiation therapy using a service delivery approach. The results got mixed reviews. In 2006, the CAMRT sponsored a supply and demand survey of its membership but there was a poor response rate (CAMRT, 2006).

For radiation oncologists in the United States, the situation has changed considerably since the ASTRO (American Society for Therapeutic Radiology and Oncology) Committee on Human resources reported in 1996, "that there is ample evidence for the existence of an oversupply of radiation oncologists in the US at the present time" (Hussey, Horton, Mendenhall, Munzenrider, & Rose, 1996). This oversupply reversed itself in less than 10 years.

A more recent US survey found shortages that had a moderate impact on hours worked — there was a slight to moderate impact on quality of patient care and ability to handle patient load (ASTRO Workforce Committee, 2003). Shortages in radiation oncology staff now occur across the United States (Kresl & Drummond, 2004). The underlying causes that these reports identify reflect comments from CWSS respondents. They include:

- over-reaction to temporary over-supply resulting in shortages a few years later
- reduced reimbursement for health care services
- increased number of cancer cases resulting in longer work hours and mandatory overtime
- demanding patients adding to stress
- more complex radiation therapy approaches requiring more planning time needed per patient

- radiation therapists less available as they have trained to become dosimetrists
- an aging workforce.

In Australia, the debate around the supply of radiation oncologists has related to whether a sufficient percentage of cancer patients are actually receiving radiotherapy according to clinical practice guidelines. Australia has developed projections. Its planning ratio is the number of radiation oncologists per 1,000,000 population. As with other Australian articles, the analysis is based on the target that 50 per cent of cancer patients should receive radiation therapy, but that this percentage is not uniformly attained (G. Morgan, Wigg, & Childs, 2000), (G. Morgan et al., 2000). Concerns identified in Australia include:

- an estimated 10,000 Australian cancer patients not receiving needed radiation therapy due to inadequate access
- inadequate training levels
- high vacancy rates for radiation therapists and radiation oncology physicists and increasing attrition rate
- inadequate and aging equipment base
- under-utilized machines due to staff shortages
- considerable variation in staff and equipment across Australia (Anonymous, 2001).

Between 1986 and 1999, there have been regular national surveys of all public and private radiation oncology facilities in Australia. They recorded workforce data for the numbers of radiation oncologists and trainees, radiation therapists, medical physicists and physics technicians, nursing staff, data managers, social workers and clerical staff. One survey concluded that low radiation treatment rates are mainly due to the lack of resource allocation. Without staff increases, one in 10 newly diagnosed cancer patients will continue to be denied access to radiotherapy in 1999 (Wigg & Morgan, 2001).

Morgan notes that in Australia, a ratio of 7 radiation oncologists per 1,000,000 population, when related to a cancer incidence rate of 3,500 per million, equates to 250 new patients *treated* per year per radiation oncologist (not just patients seen). Other issues affecting demand are the need to consider re-treatments and the increasing amount of time spent informing patients of their proposed treatment and other options (G. W. Morgan, 2001). Australia's report, a *Vision for Radiotherapy,* focuses on funding arrangements and patient access to treatment. The report:

- identifies the need to resolve fragmented support to radiation therapy
- recommends establishing a national body to address inequality of services in remote rural areas
- encourages enrolment in radiation therapy courses
- suggests that pool funding be established (Timms, 2002).

Delaney conducted a thorough site-by-site analysis of many cancer sites to determine that the optimal percentage of patients who should be treated with radiation therapy in Australia is 52 per cent — a figure somewhat higher than the percentages who actually receive it. Such data can identify where there is a need to improve access to radiation therapy services. The data are thus invaluable for radiation service planning (Delaney, Barton, & Jacob, 2003, Delaney, Jacob, Featherstone, & Barton, 2005).

In Canada, CARO conducts regular surveys to estimate future needs for filling a sufficient number of residency positions and planning for residents' supervision. For the most recent survey, 32 of 33 radiation oncology centres responded. The average number of consults per radiation oncologist in 2007 was about 280. This ratio was highest in Québec and Ontario. CARO makes detailed estimates of the workforce requirements for radiation oncologists for the next five years (basically the length of the residency training). It projects that the number of positions will increase to about 400 annually by 2011 (from about 350 now), with about 33 retirements expected over the next five years.

In most age groups, men outnumber women two to one, but for those under 35 years of age, the gender gap narrows, with about 11 female and 15 male FTEs. Estimates indicate an unfilled demand for about 30 positions for 2007 and project a balance by 2009 — noting that many hard-to-quantify factors will affect this (Canadian Association of Radiation Oncologists, 2005b; Canadian Association of Radiation Oncologists, 2007). One medical physicist attempted to develop a model based on a national survey for radiation oncologists, medical physicists and radiation therapists. Unfortunately, there was only a fair (15/25) response rate and it was not possible to reach a consensus on the usefulness of the results (Dunscombe et al., 2005).

In Canada, there are variations in access to radiation therapy:

- An Ontario study found variation in access to radiation therapy for women with breast cancer by less populated region of residence, increasing age and decreasing income (Paszat et al., 1998).

- Another study compared women with breast cancer in British Columbia and Ontario. It found that some differences in the use of RT were explained by patient, tumour and physician factors and that other possible reasons (e.g., the presence of provincial guidelines, differences in the organization of the health care system, differing patient preferences) need more research (Goel et al., 1997).
- More recently, observed rates for radiotherapy in breast cancer in Ontario suggested a shortfall of adjuvant breast radiotherapy utilization (Kerba, Miao, Zhang-Salomons, & Mackillop, 2007).

A body of Canadian research is developing to determine the best estimate of population need for radiotherapy to help inform workload planning:

- In Ontario, there was an analysis of access to radiation therapy for bone metastases. It showed: the more frequent use of single fractions, supported by evidence of effectiveness, in patients with a shorter life expectancy, in older patients, in patients living further from a radiation therapy centre, when waiting times were longer for radiation therapy, with unexplained inter-centre variations persisting throughout the study period (Kong, Zhang-Salomons, Hanna, & Mackillop, 2007).
- Utilization of radiation therapy for lung cancer, while meeting benchmark standards in areas close to radiation therapy centres that did not have waiting lists, showed a shortfall in many Ontario counties (Barbera, Zhang-Salomons, Huang, Tyldesley, & Mackillop, 2003).
- Canadian researchers have conducted systematic reviews to develop evidence-based estimates for the proportion of patients presenting with colon cancer, rectal cancer and cervical cancer, similar to the approach taken by Delaney (Foroudi, Tyldesley, Barbera, Huang, & Mackillop, 2003; Usmani et al., 2005).

3.4.4 Medical oncologists

Medical oncologists work as part of a systemic therapy team. The team includes family physicians, oncology nurses, pharmacists and pharmacy technicians. There is some consideration in the literature of supply and demand for medical oncologists (several studies in the United States and a major Ontario study). Less information is available than for radiation oncologists. Note that in Canada, all provinces use the term medical oncologist except for Québec, where there is a somewhat different training path and a haematologist/oncologist directs systemic therapy.

In Ontario, there was a massive study of the medical oncologists and other members of the systemic therapy team (The Systemic Therapy Task Force, 2000). The study found the following cost drivers:

- increasing numbers of cancer patients
- new and effective treatments
- broadening indications for systemic therapy use
- increasing patient expectations
- cost escalation for conventional chemotherapy drugs.

The report provided workload data based on cancer incidence and projections and systemic therapy visits. Projections of the demand for medical oncologists were based on the number of new cases and workload standards in teaching and non-teaching hospitals. Statistics Canada assessed the methods. It was considered to under-estimate the patient workload and, therefore, the needed number of medical oncologists. Other provinces have accepted the workload standard. Key findings of this study include:

- The number of new cases of cancer is increasing at about 2.2 per cent per year while systemic therapy workload is increasing at about 7 per cent annually.
- Community-based programs account for about 50 per cent of new systemic therapy patients. However, data from these programs are insufficient for planning.

In the United States, medical oncology developed as a sub-specialty of internal medicine. This was the result of continual adjustment to new technology. This trend, together with changing population needs, represents challenges for the future (Kennedy, 1999). In 1998, the current estimate of medical oncologists was 1.8 per 100,000 US adults, but one study projected an actual need for 3.6 per 100,000 (Eastman, 1998). To fill this gap between supply and demand, Eastman proposes relying more heavily on oncology nurses, oncology nurse practitioners and oncology physician assistants. Factors affecting this approach are that the United States faces de-skilling of nurses from cost pressures of managed care, although nurse practitioners could also help ease the shortage. There is a need for more information on the work productivity of non-physician providers.

A recent US study used a partial needs-based forecasting model to project demand for medical oncologists, haematological oncologists and gynaecological oncologists, assuming no change in cancer care delivery and physician practice patterns. Through analysis of a variety of supply and demand scenarios, this study predicts shortages by 2020 amounting

to one-quarter to one-third of the current supply (Erikson, Salsberg, Forte, Bruinooge, & Goldstein, 2007; AAMC Centre for Workforce Studies, 2007). The following factors illustrate the complexity of the situation:

- Increasing fellowship positions by 50 per cent would not fully meet demand.
- Increasing cancer survivorship is one of the driving forces for oncology services, but shortages of family physicians may preclude their capacity to provide care to patients in remission.
- Productivity gains due to implementation of measures to alleviate inefficient delivery systems and excessive paperwork may be possible, but are not yet proven.
- Increased use of nurse practitioners and physician assistants may improve efficiency and improve patient care and professional satisfaction.

ASCO concludes that a multi-faceted strategy will be needed, including these possible options:

- increasing the number of oncology fellowship positions
- increasing the use of non-physician clinicians
- increasing the role of primary care physicians (especially for patients in remission)
- redesigning service delivery.

3.4.5 Family physicians

Several Canadian articles consider specific oncology workload issues for family physicians. This review of supply and demand for family physicians also includes information on physicians in general. In addition to oncology specialists, family physicians and many specialist physicians contribute to the cancer control workforce. In some analyses, family physicians and specialists are not analyzed separately. Despite its relatively high level of health expenditure, Canada has fewer physicians per capita than most other Organization for Economic Co-Operation and Development (OECD) countries. In 2006, Canada had 2.1 practicing physicians per 1,000 population, well below the OECD average of 3.1. Between 1990 and 2006, the number of doctors per capita remained relatively stable in Canada, while it continued to increase at least slightly in most OECD countries (OECD, 2008).

After accounting for the increased demands of an aging population and the entry of more female physicians into the workforce who work fewer hours, one analysis showed that the “real” physician-population ratio

declined by 5.1 per cent between 1993 and 2000, with the "real" physician-population ratio being the same in 2000 as in 1987. Reduced physician supply also results from fewer international medical graduates entering Canada and a rising retirement rate. Increased net migration abroad played a minor role. The 10 per cent cut in enrolments to enter medical school in 1993 accounted for 2 per cent of the decline. Rising workloads are associated with lower physician supply. Within the reduced supply of physicians, there is a lower proportion of family physicians, resulting in difficulties for patients in finding a family physician (Chan, 2002).

Health Canada reports in an analysis of 2003 CAPER data that the current production of physicians will not meet demand. The Association of Faculties of Medicine in Canada (AFMC) estimated that Canada needs to increase annual medical school enrolment by 500 spaces, from 2,000 in 2003 to 2,500 by 2007. The situation is exacerbated as few medical school graduates are choosing family medicine (Cesa & Larente, 2004). Basu reports from a utilization-based model that medical school enrolments must grow at an average annual rate of 3 per cent per year to meet the Canadian population's needs for physicians (Basu & Halliwell, 2004).

The Canadian Medical Association developed the needs-based Physician Resources Evaluation Template (PRET) to estimate future physician supply. In a 1999 analysis, recommendations to alleviate physician shortages included increasing the undergraduate medical school enrolment by approximately 25 per cent and increasing the flexibility in the post-graduate training system (Anonymous, 2007-2008). Model results from a more recent analysis indicate:

- The crude FTEs of physicians per 1,000 population will increase from 1.6 per 1,000 in 2007 to 1.9 per 1,000 in 2030.
- Adjustment of results for expected reductions in workload reduce the estimates of crude FTEs per 1,000 population to 1.4 in 2007 and 1.7 in 2030.
- Further adjustment for population aging results in effectively no increase in the FTEs per 1,000 population between 2007 and 2030.

All of these results must be tempered by reports that, even with the current ratio in place, various provinces report the total Canadian shortage of physicians is at least 4,000 (or 6 per cent) and that there is a worldwide shortage of health professionals that continues to grow. Further, if all Canadian physicians worked a maximum of 50 hours per week, as Europe legislates, then Canada would face a further shortage of 8,900 physicians (Anonymous, 2007-2008).

3.4.6 Registered nurses

Nurses have been well studied in Canada. Some information is emerging on nurse practitioners but there is relatively little information available on specialized oncology nurses. Trends and projections in the supply of registered nurses are fairly well documented in Canada. According to the Organization for Economic Co-Operation and Development (OECD), Canada had 9.0 qualified nurses per 1,000 population in 2007. This is less than the average of 9.6 in OECD countries (OECD, 2010). Although most other countries showed increases, the rate of nurses per 1,000 population decreased in Canada since 1990. This decline was linked to decreased enrolment and graduation from nursing schools, together with a reduction in the number of hospital beds. However, this trend decline has been halted in recent years. The rate of nurses per 1,000 population has started to rise as of 2005 (OECD, 2008).

The Canadian Nursing Association projects a shortage of 113,000 nurses by 2016, based on a utilization-based model to track and project the supply of RNs for the years 2001 and 2016.[7] One report recommends:

- increasing enrolments in nursing education programs to reach 12,000 new nurses each year
- making efforts to increase the percentage of new graduates remaining working in Canada from 85 to 95 per cent
- undertaking research into the barriers to nursing careers.

In a more recent analysis, Health Canada reports that "nursing shortages occur in certain practice areas and that the Canadian Nursing Advisory Committee [suggests] that an additional l6,000 nurses per year are needed to achieve the same ratio of nurses to population in Canada today as 10 years ago" (CNA, 2002 and Cesa & Larente, 2004).

As predicted by a utilization-driven micro-simulation model, nursing school enrolments must grow at an average annual rate of 13 per cent per year (Basu & Halliwell, 2004). This model has been extended to predict nursing specialties where shortages will be the greatest between 2007 and 2025. Between 2005 and 2025, the number of RNs working in hospitals or in home care is projected to increase from about 312 to 325 per 100,000 population. Demand factors contributing to the nursing shortage are population aging, changing disease patterns due to aging and demand by hospital function. Supply factors include nursing school enrolment, attrition rates, in- and out- migration, retirement and death rates, working conditions, job satisfaction, retention and working hours.

7 The model projects both the supply of, and demand for, RNs based on a number of assumptions for recruitment, retention, nursing school graduations and international migration.

Nurses working in oncology are identified in one projection which shows a small but steady growth in the number of RNs needed per 100,000 population — but still remaining well under 25 per 100,000 (Basu & Gupta, 2007). There is an opportunity to explore the use of this model to obtain more specific information on the projections for oncology nurses.

A model specific to nurse practitioners in primary health care has been developed. As reported on the Canadian Nurse Practitioners Initiative website:

> "The Health Human Resources Planning Simulation Model for NPs in Primary Health Care™ is a flexible, needs-based planning model. This model goes beyond traditional HHR planning models to consider population health needs and the level of services required to meet those needs in a variety of settings. It also integrates key human resources factors such as training programs and equivalency reviews, in- and out-migration, retirements, and deaths as well as levels of provider activity and productivity. These factors help estimate the supply of NPs within health-care teams required to meet primary health care needs from 2005 to 2015."

There is an opportunity to explore adaptation of these models for oncology nurses (Canadian Nurse Practitioner Initiative, 2008).

3.4.7 Other selected cancer control occupations

Canada has about one medical physicist per 100,000 population (CIHI, 2006). For radiation therapists, the CAMRT *Supply and Demand Study* is at a disadvantage due to low response rates and the lack of provision of some data items (CAMRT, 2006). With 25 out of 39 cancer centres responding, managers reported a combined national vacancy rate of 3 per cent. However, while 60 per cent of managers indicated that they do forecast upcoming staff retirements and future needs, very few chose to provide specific numbers. As a result, it is not possible to draw conclusions. Dunscombe conducted a national survey for radiation oncologists, medical physicists and radiation therapists but the relatively low response rate limited the usefulness of the results (Dunscombe et al., 2005).

Based on medical literature reports, there is very little study of supply and demand issues for surgical oncologists. One US article suggests that a shortage of head and neck surgeons could threaten treatment (York, 2004). A utilization-based model developed in the United States uses age-specific procedure rates for surgeries for selected cancer sites. It combines these with census projections to estimate future utilization of

each surgical procedure. Results suggest that using non-physician clinicians could help relieve specialist surgeons of non-operative work (Etzioni, Liu, Maggard, O'Connell, & Ko, 2003). There is little information on pathologists and palliative care physicians. According to several CWSS respondents, there is increasing interest in determining workload measures to assess the current undersupply of pathologists.

3.5 Challenges to the Cancer Control Workforce

3.5.1 Impact on access to care

One consequence of an inadequate supply of physicians is Canadian's lack of access to medical care. In 2007, 15 per cent of Canadians aged 12 or older (about 4.1 million people) reported not having a regular medical doctor — up 3 percentage points since 1996/1997. Of these, 78 per cent (3.3 million people) reported using other services including walk-in clinics (64 per cent), hospital emergency rooms (12 per cent), community health centres (10 per cent) and other health care facilities (14 per cent). Despite widespread use of other health services, nationally, one in 15 people representing just under 1.7 million Canadians, or 6 per cent of the population aged 12 or older, reported that they could not find a regular doctor in 2007 (Statistics Canada, 2008).

Even when Canadians are seeking referrals through their family physicians, access to cancer care proves difficult. According to the 2007 National Physician Survey (NPS) (Anonymous, 2008):

- Nearly 1 in 5 family physicians (19 per cent) rated access to cancer care services for their patients as fair or poor. This ratio was higher for family physicians practicing in isolated and inner city areas and lowest in small towns (Anonymous, 2008).
- 54 per cent of specialists, compared to 70 per cent of family physicians, reported that access to cancer care services is excellent, very good or good.
- 47 per cent of radiation oncologists reported that they can see an urgent case within a day — another 48 per cent can see an urgent case within one week.
- 82 per cent of radiation oncologists and 81 per cent of medical oncologists said their practice is completely open to new patients.

For the cancer control workforce, the 2007 NPS reports on the inability of physicians to sustain long work hours and deliver quality care. Diagnostic specialties (radiology, pathology) are essential. However, 56

per cent of family physicians and 40 per cent of other specialists rated access to advanced diagnostic services as fair to poor. Only 15 per cent of anatomical pathologists, responsible for examining tissues to make diagnoses, can attend to an urgent case in one day (NPS, 2008).

Physicians who specialize in treating cancer (e.g., oncologists, radiation oncologists and others) report multiple barriers to care delivery:

- Medical oncologists identified system funding (78 per cent) and the lack of availability of personnel (71 per cent) as major impediments to their delivery of care.
- Anaesthesiologists (90 per cent reported caring for cancer patients) rated funding (74 per cent) and lack of availability of personnel (71 per cent) as barriers to care (NPS, 2008).
- Family physicians identified the main impediments to delivery of care to their patients as paperwork (57 per cent), system funding (52 per cent), bureaucracy (47 per cent) and availability of personnel (43 per cent).

3.5.2 Overtime and unpaid time

One strategy to address nursing shortages appears to be increasing the hidden hours worked through paid and unpaid overtime. In 2005, nurses' unpaid overtime work was the equivalent of 7,468 full-time positions. Both paid and unpaid overtime amounted to 10,054 full-time positions (Greenslade & Paddock, 2007). Since one-quarter of nurses already work 12-hour shifts, overtime can lead to extremely long hours at work. Some CWSS respondents reported they were responding to the increased demand by working through lunch and coffee breaks (as indicated from survey results for nurses in the previous chapter).

The 2005 National Survey on the Work and Health of Nurses (NSWHN) contains a wealth of information on working conditions of all regulated nurses, many of whom provide care to cancer patients (Shields & Wilkins, 2006):

- Female nurses are more likely to work paid overtime (30.0 per cent) than all employed females (13.3 per cent) for an average of 5.3 hours per week.
- Unpaid overtime is also more common among female RNs (49.7 per cent vs. 26.1 per cent), for an average of 4.0 hours per week.
- Overall, close to 3 in 10 RNs report a high role overload score which considers factors such as:
  - Often arrive early or stay late to get work done (54 per cent)
  - Often work through breaks to complete work (62 per cent)
  - Too much to do, to do everything well (57 per cent).

- Close to half of all nurses in hospital settings report working mixed shifts and 41.1 per cent reported working shifts of 12 or more hours in hospitals.
- Shift work is also common in long-term care facilities but in community health and other settings, few nurses work 12 hour shifts and over 70 per cent work days.
- More nurses (27.0 per cent) feel the quality of care they deliver has deteriorated compared to 15.8 per cent reporting improvement (Shields & Wilkins, 2006).

Three focus groups of nurses and radiation therapists and a number of providers said it was a challenge to be able to take time off for vacation. Particularly in small- and medium-sized centres, the absence of one staff member, even for a short period, can wreak havoc in meeting the demand to provide care to patients.

CWSS respondents were aware of these practices:

> "Hidden costs are partially absorbed as people's lunch time."
>
> "[There is] over-utilization of nurses in the form of overtime/ working through lunch breaks."

3.5.3 The need for protected time

With increasing clinical demands, workers feel pressure to reduce time spent on other activities, and redirect their time and efforts towards patient care. While this is one way to alleviate the impact of shortages, it also creates difficulties and adds to stress levels when other parts of the job are short-changed. CWSS respondents, including educators and managers, stressed the lack of protected time for continuous training and learning, research, supervising /mentoring students, administrative and management duties. The lack of time for these activities impedes health care workers from working to their optimal competencies. It also impedes managers' ability to implement new equipment or work processes if training is not completed. One nursing manager observed that, 10 to 15 years earlier, she had been able to schedule the nurses to clinical duties for four out of five days, with the fifth day reserved for research, administrative and education activities and providing some flexibility to assign the day to clinical duties, if necessary. Currently, such scheduling is simply not an option. Nurses are assigned full time to clinical duties and then experience difficulties taking time for needed education.

Managers face considerable challenges in the current environment as noted by one CWSS respondent:

> "Managers are working in multi-generational workplaces — traditionalists, boomers, Generation X, and Generation Y. The pace of technological change requires continuous training and there is more and more emphasis on the team approach. Concomitantly, there is a lack of slack time for training, education and program development, and everything focused on operations. It is time for reinvestment and renewal."

Many managers are responsible for clinical work and managing their departments. This creates workload challenges, particularly with the time-consuming administrative requirements of the job. Some CWSS respondents suggested that support staff could, and should, assume more administrative functions. This would make it possible for managers to make better use of their time, focusing on higher level, management-related responsibilities. Others noted that a lack of familiarity with management responsibilities has also contributed to increasing workloads for some managers as they climb the learning curve.

3.5.4 Job dissatisfaction and absenteeism

The management, organization and delivery of services, resource deployment and utilization affect how health care providers perceive the quality of their work-life. High absenteeism can make shortages worse if health care providers become too sick to work. Ways to assess quality of work-life include investigating the relationship between working conditions and provider health status, retention rates, turnover rates, sick time, job satisfaction and levels of burnout. It is essential to effective human resources planning to understand the work environment for health care providers and identify the trends and challenges they face.

Several research studies in Canada have explored stress and burnout among the cancer control workforce. Results from a study of systemic therapy teams in Ontario highlighted the negative consequences resulting from burnout — for both the individual and the organization. For the individual, mental and physical health problems often result because of burnout. For the organization, this translates into absenteeism, high turnover rates and reduced productivity. Also, burnout may negatively affect the quality of care (E. Grunfeld et al., 2000). A more recent study over a two-year period in an Ontario ambulatory cancer centre found overall moderately high scores for quality of work-life indicators including burnout (high emotional exhaustion, high depersonalization). However, considerable variation occurred among employee groups including physicians, nurses, physicists and radiation therapists for job satisfaction, burnout, social support and work-family conflict (Sale & Smoke, 2007).

According to the 2003 Canadian Community Health Survey (CCHS), in general, health care providers are more stressed than are all other employed Canadians, with 45 per cent reporting that most days on the job are "quite" or "extremely" stressful compared with 31 per cent of other workers. The five occupations experiencing the highest work stress levels are head nurse (67 per cent), medical laboratory technician (64 per cent), specialist physician (64 per cent), general practitioner/ family physician (59 per cent) and registered nurse (58 per cent) — all are part of the cancer control system. Radiation technologists experience average levels of high job stress at 45 per cent. Work stress increases with the number of hours worked, up to 60 per cent among those working 45 or more hours each week. There are slightly higher levels of work stress for those working shifts, other than a regular day shift (47.7 per cent vs. 42.4 per cent) (Wilkins, 2007).

Several reports confirm high stress rates for nurses. Pyper (2004) reports higher absence rates for full-time RNs (10 per cent) in 2003 than for all full-time workers (7 per cent) — with unregulated health care workers even more likely to be absent (12 per cent). Days lost for full-time RNs were also higher at 15.4 days in 2003 compared with just 9.1 days for all full-time workers. This was less than the 18.6 days for unregulated workers.

Results from the National Survey of the Work and Health of Nurses (NSWHN) indicate (Shields & Wilkins, 2006):

- Nurses are more likely to report high levels of work stress than other employed workers, with 31 per cent reporting high job strain, 45 per cent low co-worker support, 25 per cent low supervisor support and 62 per cent high physical demands.
- Nurses in hospital and long-term care settings are more likely to report lower autonomy (about 25 per cent with low score) than do nurses in community health and other settings (13 -15 per cent). There are similar patterns for control over practice, with more nurses in hospital and long-term care settings reporting low scores.
- Overall, 12 per cent of nurses reported low job dissatisfaction compared to just over 8 per cent of the total employed population.

Other health and safety risks that nurses experience according to the NSWHN include:

- on-the-job injuries (8.9 per cent)
- needle stick or sharps injuries (11.4 per cent in past 12 months)
- physical assaults from patients (28.8 per cent)

- emotional abuse from patients (43.6 per cent)
- concern about own risk of contracting a serious disease in the workplace (47.8 per cent).

Further, NSHWN data show:

- Back injuries are more common among female nurses (25 per cent) than all employed females (19 per cent).
- Higher proportions of nurses report depression, arthritis and high blood pressure, among other conditions.
- More than one-third of nurses report pain in the last 12 months that affected normal activities. The pain was severe enough in the past six months that it affected the ability of nearly one in four nurses to do the job.
- Just over three in 10 nurses report that their physical and mental health made it difficult to handle their workload in the past four weeks.
- Not surprisingly, 61 per cent of nurses report work absences due to any health problem. The average number of days missed was 23.9 for those taking at least one absence, and 14.5 for all nurses.

While these data are presented for all nurses, and not specifically for those working in oncology, oncology nurses are likely to experience broadly similar working conditions. Special tabulations provided from the NSWHN indicate sufficient responses by nurses working in oncology are present to permit useable comparisons.

With some exceptions, unless prompted, most of the CWSS respondents did not immediately identify burnout and low morale of healthcare. Possibly, this reflects the reality that having lived with this issue for so many years, many CWSS respondents feel it has become common knowledge. When prompted, other CWSS respondents commented on stress and morale issues but, as noted in two focus groups of nurses and radiation therapists and a community chemotherapy unit, “what saves us is the staff we work with…we can always find someone to talk to.” Most CWSS participants, when prompted, identified the support available to employees in the workplace.

Results from the site visits and focus groups indicate a high commitment of many cancer control workers to their jobs, their patients and their employers. Some are enthused by the many challenges they face. Nevertheless, others are having difficulty coping. Team members questioned how student nurses would react to present day challenges in oncology: “Would this be a life they would want to lead?” Another

CWSS respondent commented that some older nurses are not able to work full-time due to the physical demands of oncology care.

The consequences of not dealing with the many issues facing the oncology workforce is burnout and dissatisfied workers leading to poor quality care and more time lost due to illness, work injury or absenteeism**.** The high rates of absenteeism among nurses take a toll on the physical and mental health of all nurses. One report, based on calculations from the Canadian Nurses Association, reports that the total work-time loss due to absenteeism represents 9,754 full-time nursing positions and that this contributes to the over-taxing of a stressed health care system (Greenslade & Paddock, 2007).

3.5.5 Increased complexity of treatment

CWSS respondents consistently identified the impact on workload of treatment advances leading to increased complexity of care. While treatment advances result in better patient outcomes, the greater complexity is also driving the demands placed on the cancer control workforce. This increase in complexity was reported across the cancer control continuum. It was particularly evident for pathology, radiation oncology and systemic therapy.

In particular, patients may now receive systemic therapy over longer periods, sometimes for many years. With the approval of new drugs for treatment, many patients now have the option to receive multiple lines of therapy. Individual courses of treatment may be delivered over a year or more, rather than the previous usual of about six months. With more courses of treatment comes the requirement for additional staff to deliver the required care.

Pathologists responding to the CWSS agreed that the complexity of cases and the need for more precise information for personalized treatment plans has added to the pathologists' workload. In addition, working in inter-professional teams requires additional time for pathologists to prepare detailed reports of analysis to communicate information to oncologists planning the patient's treatment. Tissue assessment has also become more time-consuming. For example, several decades ago, when breast cancer tumours were larger and mastectomies were common, pathologists would need to examine just a few sections to arrive at the cancer diagnosis. With smaller tumours and breast conserving surgery involving the removal of the least amount of breast tissue possible, pathologists may now need to examine 90 or 100 sections to determine both whether cancer is present and whether sufficient margins of normal tissue are present around the tumour specimen.

CWSS respondents noted that the planning process for radiation treatments has become more complex, increasing the workload for radiation oncologists, dosimetrists, medical physicists and radiation therapists. Determining the right workload for radiation oncologists is challenging. Both the number of new consults and the number of follow-up consults should be considered, and there are no nationally accepted guidelines. In Canada in 2007, radiation oncologists reported an average of 280 new consults in 2007, with higher numbers reported in Ontario (about 290) and Québec (about 350) (Canadian Association of Radiation Oncologists, 2007). This compares to 250 new patients treated per year in Australia (G. W. Morgan, 2001). Even with these high ratios, there are concerns that not all potential patients have access to radiation therapy.

Workloads for medical physicists have also increased due to the use of increasingly complex technology and the number of new patients and cancer survivors — all of which contribute to more time needed for planning and quality assurance. These trends also affect the workload for the radiation therapists and dosimetrists who are integral members of the radiation team.

The following comments indicate how well aware most CWSS respondents were of the impact on their workload of the increasing numbers of patients:

> "The cancer incidence (i.e., number of new cases) is increasing by 2.5 per cent per year, and prevalence is also increasing as patients are living longer with their disease, for a total workload increase of 5-6 per cent per year."

> "Increased chronicity of disease means greater demands for care; cancer is now becoming a chronic condition, therefore care spills over to the family physician."

A number of CWSS health care provider respondents said two of the greatest pressures were trying to prioritize whom to treat when, and managing wait lists. The need for better patient scheduling is part of the workload management issue.

3.5.6 Increased pressures to respond to rising patient expectations and needs

Increasing patient expectations also contribute to increasing workload. As treatments become more complex and more options become available, cancer care providers need to spend more time discussing alternatives with patients. Patients have access to considerable information on the internet. They come to their consultations with many questions on their mind and printouts in their hand. As CWSS

respondents observed, patients may have trouble in finding their way through the system, leading to more questions and demands. With increasing volumes and care facilities stretched to the limit, confusion with appointment times and the unavailability of necessary documentation to plan the next steps in the cancer patient's journey waste a great deal of time. Finally, inpatients in hospitals are sicker than in previous decades, putting greater demands on the cancer control workforce to provide care. CWSS respondents observed, "Patients have new expectations of and demands on the system as they are better informed" and "patients come in with reams of information, and need to develop a common sense of what are realistic options."

Other respondents were concerned about their ability to meet patient needs:

> "Patients are angry and lashing out as there is no funding for some drugs in Ontario that are covered in other provinces."
>
> "Patients are suspicious we are withholding treatment."
>
> "We need to organize documentation better, there are lots of booking errors, with patients arriving at the wrong time, or with incomplete documentation.
>
> "It's hard to have enough time to provide quality care to patients."
>
> "Patient situations can be very complicated, for example they may be near death. Our staff needs to have very good communication skills."
>
> "We are so busy no one has the time."

3.6 Challenges to Data Development For Cancer Control Workforce Planning

3.6.1 Ongoing need to improve data availability, quality and comprehensiveness

Over the past five years, there has been a substantial improvement in Canadian health human resources (HHR) data. This will result in more and better cancer control workforce information as data sets mature. CIHI initiatives include:

- commencing data collection for nurse practitioners as part of the Registered Nurses Database, a national occupational survey from the nursing sector study to permit comparisons to cancer nursing characteristics across time with the NSWHN
- collaboration with Statistics Canada and publication of results from the NSWHN

- initiation of five new databases for occupational therapists, pharmacists, physiotherapists, medical laboratory technologists and MRTs.

As of the 2008 collection year, the MRT database has begun to report information on radiation therapists. The major databases providing information on the cancer control workforce are in Appendix D.

Statistics Canada has also upgraded several surveys. These have provided useful information on health human resources. Employment and demographic issues are in the Labour Force Survey. The Canadian Community Health Survey has information on the analysis of work force health issues for some cancer control occupations. Both of these surveys have a sufficiently large sample size to permit identification of the larger occupational groups, such as general and specialist physicians, nurses, pharmacists, dieticians, occupational and physiotherapists, medical laboratory technicians and medical radiation therapists. They can all be identified using the 4-digit codes available in the Standard Occupational Classification. The recently released 2006 Census of Canada includes information on occupation and other census variables for 20 percent of the Canadian population (Appendix D).

The resources that are available to manage data collection, compilation, analysis and dissemination affect data quality. Data and reports from well-resourced organizations such as CIHI, Statistics Canada and Health Canada are readily available. There are well-defined quality assurance processes. There are other well-documented sources from major professional organizations such as the Canadian Medical Association (CMA), the Association of Faculty of Medicine's CAPER, the Canadian Nurses Association's certification database and the Canadian Nurses Association and Canadian Association of Schools of Nursing's national student faculty database. A lot of information is available on the web.

Some surveys that researchers or health professional organizations have undertaken have had inadequate response rates. This has hindered the collection of useful information. In particular, many groups approach physicians, leading to a high response burden and low response rates. By contrast, due to resource constraints, information from the membership databases for the smaller professional organizations tends to be produced primarily for internal use and some organizations do not track members at all. Furthermore, such data give a fragmented picture of the cancer control workforce. Their focus on only one occupational group impedes understanding of team issues.

Privacy issues can limit access to the data that do exist. CWSS respondents observed that it is hard to collect recruitment and retention data if geographic (i.e., postal code) areas are too broad. For many data sets, it is not even possible to capture publicly available postal codes at the 6-digit level. What is needed for health human resources planning purposes is population level data that are anonymous at the individual micro-data level. Some provinces have access to such data internally, but available national data are limited. As one respondent put it, with regard to interpreting privacy legislation:

> "A lot is dependent upon individuals rather than policy — a "doer" will find opportunities to make things happen, while a more conservative person will find ways to obstruct."

Finally, ongoing analysis of existing and new data sets as they come on stream can be expected to lead to recommendations that would improve their usefulness for descriptive and analytic studies of the cancer control workforce. Typical recommendations might be to improve identification of specific occupations on a data set, to add new variables or to link data sets to generate new knowledge.

3.6.2 Need for analysis of demographic and trend data pertaining to the cancer control workforce

Effective planning for the cancer control workforce is clearly impeded by the lack of readily available information, consolidated in one place to provide an answer to the question, "Which health care providers are available to provide cancer control services to which patients?"

A careful and thorough analysis of existing data sets could provide information that would extend the brief overviews presented earlier in this report and include trends, demographic issues, education, inter-provincial migration, retirement plans and working conditions.

Clearly, there are opportunities to build on the strong foundations of the many Canadian data sets to improve our understanding of human resources issues in the cancer control workforce. A team of experienced analysts conducting an in-depth analysis and data mining could shed considerable light on issues that this report identifies, identify gaps and provide direction for further improvements to databases. What is lacking to achieve this work is the presence of a centralized, co-ordinated analytic capacity with the leadership that can bring key people from various organizations together to consider what the available data can best answer.

3.6.3 Need for research to understand what services the cancer control workforce provides

Several CWSS respondents highlighted as a key unanswered question: what services do physicians and nurses provide to their patients? For example, understanding the types and volumes of services that family doctors provide to cancer patients would be very helpful to planning cancer control programs. A CWSS respondent indicated that, in at least one province (British Columbia), the lists of family physicians providing services to cancer patients could be obtained — based on the percentage of billings for cancer services. Recently released NPS data provides some indication of the characteristics of physicians who provide care to cancer patients. In addition, for physicians in particular, there is much available, useful National Practitioner Data Bank (NPDB) information based on physician claims for fee-for-service. It could be analyzed to understand what services are provided to cancer patients, according to provider characteristics. A limitation of the NPDB is that it does not document services provided by salaried or block-funded physicians. The Discharge Abstract Database that CIHI maintains includes data on all inpatient hospital separations. The data could be analyzed for insights on which providers are providing what surgical and other procedures to cancer patients.

To get a true picture of nurses working in oncology, there is a need for information about:

- RNs not certified in oncology but providing care to cancer patients in any care setting
- RNs certified in oncology but not working with cancer patients
- oncology nurses who *are* working with cancer patients.

There is some knowledge on how many oncology nurses currently work in Canada. However, little is known about what contributions other nurses make towards the care of cancer patients. Information on what services oncology nurses working in the community are providing, or the role of nurses working with cancer patients in the community is needed to understand how best to deploy the cancer control workforce.

Community-based data are needed to understand primary health care utilization patterns. As family practitioners move towards a more team-oriented approach, it is becoming more difficult to capture what is happening in the health system from currently available data sources.

3.6.4 Need for integrated and linked data sets

The capacity to link data sets needs to be improved. Improvements will make it possible to use the existing data sets to find out who are providing cancer control programs and to get a better understanding of what services the cancer control workforce is providing, particularly for physicians and nurses. The funding ($300,000) that Health Canada provided to CIHI for the NPS will help with this work.

The first step is to be able to capture the provider of services in various data sets. This requires a unique provider ID at the national level. Currently, this ID number is in place only for physicians. A unique ID for nurses (including cancer nurse specialists) would be useful. Currently, this is not collected. The need for this kind of provider ID number will become increasingly obvious as the new CIHI data sets mature for pharmacists, medical radiation technologists and medical laboratory technologists, occupational and physiotherapists.

A unique provider (ID) number for each health provider across Canada would make it possible to link health provider data sets. One respondent said that linking the Scott's Medical Database with the NPDB would help in understanding the relationship between reported and working specialty for physicians.

3.6.5 Need population-based understanding of utilization rates and workload ratios

CWSS respondents noted large gaps in knowledge of the impact of current best practice standards on utilization rates. For example, for a given sub-stage of breast cancer, what is the percentage of women who should receive systemic therapy according to guideline recommendations? There may be clinical practice guidelines to guide individual decisions by individual care providers. However, further research, such as in Australia (Delaney et al., 2005) and in Canada (Paszat et al., 1998) (Foroudi et al., 2003) (Barbera et al., 2003; Bardell, Belliveau, Kong, & Mackillop, 2006; Kerba et al., 2007; Kong et al., 2007; Usmani et al., 2005), is needed to determine the impact of these guidelines on the care needs at the population level.

A related issue is *workload ratios* to guide planning models. The literature has some information on the typical number of new patients that a radiation or medical oncologist should be seeing each year. Some CWSS respondents stressed that workload ratios need to be considered as guidelines and there is a need for flexibility in their application to deal with changing technology or work processes. However, as Wortsman and Janowitz (unpublished report) identified, human resources standards are required to help benchmark what is essential to provide effective cancer control.

3.6.6 Need for a dynamic population-health based HR planning system

In Canada, CAPCA has attempted to develop a health human resources planning model — the Human Resources Planning and Information System (HR-PIS), renamed the Cancer Workforce Planning Tool (CWPT). This model, when fully developed, will provide valid dynamic data for planning by bringing together supply and demand side information and information on radiation therapy equipment. This can be used to determine workload projections, productivity norms, human resources plans, training and residency plans. As noted earlier, what is required is a population needs-based model instead of models that rely primarily on past utilization trends. Demand side data are made up of population and cancer incidence data and cancer control activity information. Supply side data include aggregate information on human resources, staffing allocation and productivity data, and training and residency program data. Initial implementation has been for radiation therapy, medical physics, radiation oncology and medical oncology in participating provinces across Canada.

Ideally, this model should be populated with data available from other data sets, instead of undertaking its own data collection. One reason is that there is currently considerable overlap in data collection for the HR-PIS, the CARO data and with other attempts to conduct supply and demand projects for CAMRT and the Canadian Strategy for Cancer Control (CAMRT, 2006) (Dunscombe et al., 2005). Overall, there has been very slow progress in database and model development for specific cancer control workforce occupations. This is due to inadequate resources and fragmented data availability. One productive approach would be to collaborate with existing teams building HHR models, such as at Health Canada and to ensure cancer control workforce needs are built into future work on these models. Alternatively, given the relatively small number of radiation therapy centres, there seems to be little reason (apart from resources) why Canada could not devise a similar approach to that taken in the United States and Australia to develop good planning data for all of the radiation therapy team.

CWSS respondents called for consistent benchmarking data across all provinces on the number of providers in cancer control and the annual vacancies (unfilled positions and attrition) for occupations. There is also a need for consistent definitions across provinces to enable reasonable benchmarking. Ideally, models would incorporate data on the impact of disease trends and demographics. Because of Canada's excellent system of cancer registration and the existence of many well-integrated databases, there is considerable opportunity for model development. There should be work to document existing planning models and bring together modellers to exchange ideas and determine feasible approaches.

Chapter 4 Education and Training of The Cancer Control Workforce

Human resources planning to ensure an appropriate supply of effectively trained workers requires an understanding of the infrastructure of educational and training programs and the flow of individuals through these programs and into the workforce. This chapter:

- examines trends and challenges with educating and training current and future health care providers to work in cancer control
- identifies a number of opportunities to address the challenges.

Results from primary research work completed for the CWSS show the need to better co-ordinate and integrate planning at a pan-Canadian level. This will assist in identifying areas where joint collaboration among the education system and its partner stakeholders can create more efficient and effective strategies to address the pressing demands.

4.1 Chapter Highlights

Over the last five years, the focus in Canada has been on producing more graduates in an effort to address human resources needs in health care. This chapter summarizes the key developments. CWSS respondents identified a number of opportunities to address a variety of challenges and generate much-needed information for effective planning. In addition, more funding is essential to produce a sufficient number of appropriately educated health care providers in cancer control over the coming years.

4.1.1 Increased enrolment results in the need for distance learning and alternative learning experiences

- Institutions are using virtual learning environments and online training to reach out to more students and to students in remote and rural locations. Longer-term cost savings offset the initial start-up costs for these new technologies. In addition, students benefit from savings on travel and relocation expenses.
- Finding clinical placement opportunities is a challenge for many programs. Some institutions are augmenting the traditional practice experience with alternatives such as clinical simulation practice. Other stakeholder groups are using web-based databases and tools to provide a greater range of experiences.

- Finding health care providers who are willing to be preceptors is an issue. Many stakeholder groups are reviewing the current structure for arranging preceptors. The clinical workload of most provider-preceptors is so great that many are not able to take on more responsibility during regular working hours. Understandably, they are reluctant to work overtime hours, especially if there is little or no remuneration.

Often, preceptors do not receive training on how to effectively supervise and mentor students through the clinical practice experience. This, in turn, affects the quality of the student's practical experience.

4.1.2 New strategies are required to attract and retain faculty

- The number of faculty members has not kept up with the increase in admissions and enrolment of students in most Canadian programs.
- In most disciplines, a significant number of faculty members are approaching retirement in the next five years.
- There are challenges in recruiting faculty members and attracting potential teachers whose time is limited due to clinical needs or who can earn more outside of academia alone.
- Some educational institutions are developing innovative remuneration structures to entice potential and existing faculty members to work in combined clinical and academic settings.

4.1.3 Educational institutions must adapt the curriculum to reflect changing needs

- The continuous evolution of technology and treatment advances and the increasing recognition of the need for inter-professional teams for collaborative, patient-centred care affect programs and curriculum in many occupations.
- Some educational institutions seek to incorporate more oncology courses. Others are developing advanced level curricula to provide higher learning to support advanced practice roles in certain occupations.
- The question of "training to what" is asked among some faculty members who are caught in the dilemma of training students to meet licensing requirements and at the same time to be prepared for rapidly changing work environments.
- Entry-to-practice credentials are not keeping up with evolving technological changes and the introduction of new processes into the workplace.

4.1.4 Inter-professional education must be integrated into the curriculum

- Stakeholder groups working towards incorporating inter-professional education (IPE) into their programs must work through obstacles such as attitudinal issues among some faculty members and health care providers, course scheduling challenges and already full programs.
- Inter-professional education involves training in the "softer skills" such as conflict resolution, communication, and managing and working in a team environment to optimize staff participation in clinical decision-making across disciplines.
- Equipping new students and the existing cancer control workforce with these skills and knowledge will help the inter-professional team environment and lead to quality patient-centred care for the patient and family.

4.1.5 Providers and faculty are challenged to find time for non-clinical responsibilities

- There is a need for continuing professional development for both health care providers and faculty members in cancer control.
- Online and distance education courses allow health care providers the flexibility to study at their own time and pace. However, finding the time to take the necessary training to keep up with the new knowledge and skills is the critical challenge.
- Limited non-clinical time is identified as a key issue. Health care providers must balance competing priorities including clinical demands, teaching, research and professional development.
- Providers must address the need to train and mentor others into more senior roles and management responsibilities.

4.1.6 Opportunities to address challenges and generate further information

- Create ongoing forums for stakeholder groups, including governments, to collaborate and exchange knowledge and ideas on education. For example, improved collaboration between education and practice will enable educators to continuously redesign curriculum. Such "just-in-time" curriculum adjustment can build on best practices from non-health sectors.
- Explore innovative remuneration structures for faculty to help attract more clinicians to teaching and offer creative opportunities for combined teaching, research and clinical practice.

- Collect consistent information on demographic factors and retirement projections for faculty members. Most evidence pointing to an aging faculty workforce is anecdotal. An understanding of the gaps and pressure points is needed to address these challenges in the medium- and long-term.
- Some approaches to attract more sites for clinical training include:
  - Offer financial rewards and incentives to medical training facilities and/or preceptors.
  - Provide more training and support for students and preceptors in their local areas.
  - Reduce clinical caseloads for staff who teach.
  - Increase staffing levels to ensure more protected time.
  - Develop workshops, manuals and online tools to prepare students and preceptors for placements.
  - Provide adequate physical learning environments.
  - Increase collaboration between service and education with more educators.
- Attract more preceptors through adequate compensation, protected time, and education and training. Since most preceptors do not receive compensation for supervising students or residents, it is essential to provide preceptors with protected time and remuneration. Education and training is also critical to equip preceptors with the skills and knowledge to guide and train new health care providers.
- Supplement clinical learning experiences with simulation learning techniques to address scarce placement spaces in Canada. At the same time, more research is required to investigate the costs of clinical placements, make governments aware of the costs and present the case for funding support (Canadian Association of Schools of Nursing, 2007b).
- Conduct more research on how best to integrate interdisciplinary professional education (IPE) into current health sciences programs. In particular, identify best practice examples that address the organizational challenges with integration. These include working towards the inter-professional team approach to patient-centred practice so that students can bring their IPE into the workplace.

4.2 Educational Requirements of Selected Cancer Control Occupations

This section presents the well-document educational requirements for the 10 occupations that the CWSS reviewed.

4.2.1 Physicians and oncologists

The path for the medical oncologist, radiation oncologist, surgical oncologist, family physician/general practitioner, palliative care physician and pathologist is to complete a three- or four-year undergraduate Medical Doctor (MD) degree program at an accredited university. Some medical schools require two to three years of pre-medical education. Others require a bachelor's degree, which is typically four years. In Québec, candidates may enter medical school once they complete their CEGEP, which can take a total of six undergraduate years (CIHI, 2006). On completion of medical school training and prior to applying for licensing, physicians must complete the Licentiate of the Medical Council of Canada (LMCC), which entails successfully completing the Medical Council of Canada's Qualifying Examinations Part I and II.

Following the completion of medical school and successfully obtaining the MD degree, physicians undertake post-graduate training (often referred to as residency training). This consists of two years for family medicine, another year for palliative medicine, and four to six years for other specialties and subspecialties (Canadian Information Centre for International Medical Graduates, undated) (CIHI, 2006). An educational license is issued to post-graduate trainees permitting them to practice in Canada under supervision.

Upon completion of post-graduate/residency training, physicians must be certified in either family medicine or a specialty prior to being fully licensed. Family medicine candidates must pass the College of Family Physicians of Canada (CFPC) Certification Exam. Other specialist candidates must pass the Certification Exam for their specialty, administered by the Royal College of Physicians and Surgeons of Canada (RCPSC). Currently, the RCPSC recognizes accreditation without certification for General Surgical Oncology. This changed in 2009 as the RCPSC and the Collège des médecins du Québec (CMQ) issued the first Certification Exam for General Surgical Oncology to certify this discipline in Québec.

It should be noted that in Québec, the medical oncologist is a haematologist with some solid tumour training. Because of the crossover

concerning certain diagnoses, most specialists practicing haematology and oncology in Québec are both haematologists and oncologists (Fédération des médecins spécialistes du Québec, 2008).

4.2.2 Nurses

Most provinces in Canada now require a baccalaureate in nursing (BN or BScN) to become a registered nurse. This is typically a four-year program (Canadian Nurses Association & Canadian Association of Schools of Nursing, 2008). Some provinces, including Manitoba and Alberta, recognize a diploma in nursing to enter the profession. Diploma programs take three years to complete. A number of colleges in Québec offer their diploma programs with the option of continuing on, after completion, to a degree program. In Alberta and Manitoba, most students enter a diploma program. They can then progress seamlessly into a baccalaureate program because of articulation agreements set up for this purpose. Another option for students is to enter a baccalaureate program with a diploma exit option. Students take the same courses as those in the diploma program for two years and then make a choice: students who elect the diploma program complete their final courses and obtain their diploma after three years of studies — students who choose the baccalaureate route continue on to complete a BScN/Bachelor of Nursing program after four years of study.

Some nursing diploma programs have merged with baccalaureate programs following the announcement that most provinces and territories would require a minimum of a four-year baccalaureate degree. The merged diploma and baccalaureate programs, called "collaborative programs," offer a unique blend of practical experience and nursing theory (CIHI, 2007e). Some colleges now have degree granting ability and confer baccalaureate degrees (e.g., Langara College in British Columbia).

In an effort to train more nurses, fast-track programs are being offered. These programs make it possible for students to complete their education in less time than traditional programs. They include accelerated, fast-track, compressed, second-degree entry, advanced entry and bridging programs. In the 2006-2007 academic year, there were 38 fast-track nursing programs in Canada, an increase of 19 per cent from 2005-2006 (Canadian Nurses Association & Canadian Association of Schools of Nursing, 2008). With the exception of Prince Edward Island, all provinces offered at least one fast-track Entry-to-Practice (ETP) program during 2006-2007. The numbers reported by province include Ontario (N=12), Québec (N=7), Alberta (N=6) and British Columbia (N=5).

Nurse practitioners and clinical nurse specialists are the current advanced nursing practice roles in Canada. These are registered nurses who are licensed by and accountable to the registered nurses' regulatory body legislated in each province and territory (Canadian Nurses Association, 2002). Advanced nursing practice requires a combination of a graduate degree in nursing and clinical experience. Additional regulation and standards are generally not required for advanced practice nurses because, even if they are assigned additional responsibilities, they still practice within the scope of registered nursing within their jurisdictions. The nurse practitioner is the only advanced nursing practice role with additional regulation and title protection, although the specific title varies among the provinces and territories.

The Canadian Nurses Association offers certification in 17 specialties, including oncology and palliative care. Registered Nurses attain the distinction of CON(C), Certified in Oncology Nursing (Canada) when they complete the certification exam that the Canadian Nurses Association offers. Oncology is a specialty within nursing. It consists of three roles: generalist nurse, specialized oncology nurse and an advanced oncology nurse.

The generalist nurse graduates from a diploma or baccalaureate program and will often work in settings where cancer patients receive care along with other patient populations (e.g., emergency unit, surgical unit or community). The nurse is designated as a generalist nurse on first entering a setting where the primary care is cancer care. The nurse may move to the next level by getting additional knowledge through in-service, continuing education, skill development and practice, and clinical experience in a setting where individuals with cancer and their families are the prime focus of care.

The specialized oncology nurse has a combination of expanded education and experience focused on cancer care, such as two years in a setting delivering primarily cancer care. Specialty education may be gained through enrolment in an undergraduate nursing program, completion of an Oncology Certificate Program,[8] distance specialty education or registration in and attainment of the CON(C). An advanced oncology nurse is prepared at the master's degree level (MScN or equivalent). Ideally, the graduate program focuses on oncology nursing, with a particular emphasis on a sub-population or area within cancer control, or a theme within cancer care such as coping, psychosocial care and counselling (Canadian Association of Nurses in Oncology, 2008).

8 For example, the Loyalist College in Ontario offers an Oncology Nursing Certificate Program. The program has four theory courses and a practicum.

4.2.3 Medical physicists

The *medical physicists'* training typically requires a four-year undergraduate degree in physics or engineering physics followed by two years of graduate work (Master of Science degree) in medical physics or physics. In Québec, two years of CEGEP are a pre-requisite, plus three or four years for an undergraduate degree in physics or engineering physics respectively. Many provinces also require a PhD degree in medical physics or physics. This is a further four to five years of study, plus two years of residency training in a clinical setting (CIHI, 2006).

Two medical physicists interviewed for the CWSS said that more employers are recruiting medical physicists with a PhD and it is challenging to get residency training if a student does not have this credential. Many Canadian medical physicists become members of the Canadian College of Physicists in Medicine (CCPM) by passing written examinations administered by the College. These exams are written after completion of two to three years of clinical supervision. Certification with the CCPM is currently not a requirement except for medical physicists employed in senior-level positions and in academia.

Several medical physicists consulted in the CWSS reported on the movement in both Canada and the United States to certify their profession. The increased demand over the past three decades for accountability of medical physicists is influencing the drive for certification. This includes their accountability to their peers, clinical colleagues and the public as the complexity of both medical imaging and radiation oncology increases (Hendee, 2007). The Commission on Accreditation of Medical Physics Educational Programs (CAMPEP) reviews and accredits medical physics programs, including the residency programs in the US and Canada (CAMPEP, undated). Currently, 15 CAMPEP-approved residency programs are in place in North America. It is expected that this number will increase as certification of medical physicists becomes a reality in the Canada and the United States.

4.2.4 Radiation therapists

To be eligible to be a certified radiation therapist, candidates must complete an accredited medical radiation technology program (CAMRT, 2008a). In Canada, this is either a degree or a diploma program that includes allotted time for clinical experience. The degree program is typically a 33-month or three- to four-year program. The diploma program is 24 to 28 months. Upon completing either program, candidates may be eligible to write the certification examination that CAMRT administers.

An increasing number of radiation therapy programs are moving toward degree programs. Currently, Canada has five degree and eight diploma programs (CAMRT, 2008b). Of the five degree programs, three are jointly delivered by a college and a university. CWSS respondents involved with the radiation therapy programs indicated that there would have been more degree programs if the federal government had not issued a national moratorium on degree programs a few years ago. The recent lifting of the moratorium is paving the way for the educational institutions to resume application for the degree program.

One reason to move to a degree program is to bring radiation therapy into parity with the other health care professions and allow them to participate in the full range of activities as part of the movement towards collaborative teams. Radiation therapists with degrees are better prepared to participate in research projects. These research projects include clinical trials and taking on education and management responsibilities. Course work in research methods, statistics and other areas that a degree program covers is clearly an advantage in developing the cancer control workforce.

Movement towards degree programs will also provide graduates with more opportunities to move into other fields of study at some point in their career. For example, graduates may enter the management field and combine their radiation therapy degree with a Master of Business Administration (MBA) or, as one educator pointed out, decide to pursue a registered nurse degree. Educators feel that the degree program will allow the time for the additional courses necessary to pursue these opportunities. Finally, degree programs will permit the establishment of a master's degree program. It, in turn, will provide the educational requirements for advanced practice designation, similar to the path that advance practice nurses follow.

In some cases, diploma programs are linking with university degree programs where the university will recognize the radiation therapy program and apply it towards a baccalaureate degree. For example, Athabasca University will recognize the Radiation Therapy Diploma from the Cross Cancer Institute's School of Radiation Therapy and will apply it towards a Bachelor of General Studies or Bachelor of Science degree.

4.3 Trends in Education and Training

The trends identified and discussed in the CWSS stakeholder group interviews across Canada include an increase in enrolments and graduates, alternative learning methods, continued professional

development, alternative clinical practice experience, innovative remuneration structures for faculty, inter-professional education for collaborative patient-centred practice, new programs and courses and advance practice education. Some trends are common across all the 10 disciplines under study. Others are specific to one or more of those disciplines.

4.3.1 Increasing enrolments and graduates — physicians

Most educators consulted indicated an increase in their program enrolments in the last several years. There are enrolment and graduate data available for most of the physician oncology disciplines. They are also available for registered nurses and nurse practitioners, although in the latter case, the data are general and not specific to oncology. There are no similar and readily available data for medical physics and radiation therapy. Some data for medical physics has recently been presented at conferences but has not been published.

In 2008-2009 there were 17 medical faculties across Canada. Since 2001-2002, enrolment into undergraduate medical school increased in each year from 6,937 students in 2001-2002 to 10,148 in 2008-2009. First-year students accounted for 26 per cent of the students enrolled in 2008-2009 while 27 per cent were in second year, 24 per cent in third year and 21 per cent in their fourth year of study (AFMC, 2009).

Attrition[9] data for medical students shows that 40 students enrolled in the 2007-2008 year withdrew (AFMC, 2009). The main reason cited was "personal." Other reasons included "change of career goal and 'academic' reasons." There were similar patterns for the 42 medical students who withdrew from the program in 2004-2005 (AFMC, 2007).

According to preliminary estimates, the number of MDs awarded in 2009 was 2,344. Women will account for 57.3 per cent of these degrees, remaining relatively stable over the past five years but an increase from the 36.8 per cent recorded 25 years earlier. Since 1996, women have

9 Attrition rates are calculated as follows:

- All students enrolled during the 2007/08 year academic year and who had definitely dropped out by September 806 are included, irrespective of reason for drop out.
- Students who were on leaves of absence during the 2007/08 academic year and who were expected to return to medical studies during the 2007/08 academic year are included if they did not enrol in 2007/08 and the Faculty of Medicine confirmed that they would not be returning at a later date. Students, whose leaves of absence were extended, for whatever reason, are not counted as drop outs.
- Students who were expected to graduate in 2008 and who were later reported on the "List of Graduating Students, 2008" as drop-outs are included in these counts.

accounted for close to 50 per cent or more of the MDs awarded each year (AFMC, 2009).

CAPER presents post-MD educational data for family medicine, medical, laboratory medicine and surgical specialties (Figures 6 to 11). For each specialty considered, data are presented here for the number of first-year residents, total residents and fellows enrolled, and the number of trainees entering practice in selected years between 1995-1996 to 2008-2009, with some exceptions.[10]

The *total number of enrolments*[11] in six post-graduate training fields of family medicine, palliative medicine, medical oncology, radiation oncology, pathology[12] and general surgery increased between 2001-2002 and 2008-2009. Enrolments also increased in each training field between 1995-1996 and 2008-2009[13] (CAPER, 2009) (Figures 6 to 11).

Total enrolments for palliative medicine, medical oncology and general surgery increased steadily for each year presented. By contrast, enrolments showed slight dips (family medicine) or rather substantial dips (radiation oncology, pathology) in 1999-2000 and 2001-2002.

Four of the six training fields saw increases in the number of *trainees entering practice* in 2007-2008 and 2008-2009 compared to earlier years (Figures 6 to 11). However, during the same time periods, the number of trainees entering practice for pathology and general surgery fluctuated.

Looking at trends in each specialty area:

- For family medicine, the number of first-year residents, the total number of residents and fellows, and the number of trainees entering practice were all relatively stable between 1995-1996 and 2001-2002. Then, they increased by about 40 to 60 per cent for 2007-2008 and 2008-2009 (Figure 6).
- For palliative medicine (a relatively new specialty), there was steady growth in the number of residents and fellows from 8 in 1999-2000 to 24 in 2008-2009. This translated into 11 trainees entering practice in 2007-2008 and 10 in 2008-2009 (Figure 7).

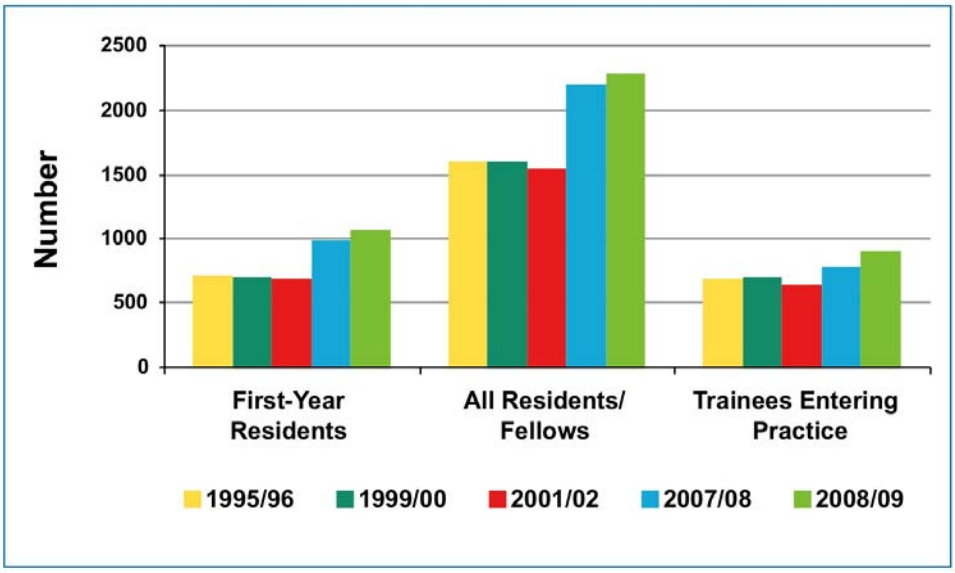
10 Data are not presented for first year residents for palliative medicine and medical oncology as residents enter these specialties after the first year. For palliative medicine, residencies did not exist in 1995-1996.

11 The total enrolment includes first year residents and all other residents and fellows.

12 Pathology data are presented as a sum of the following sub-groups of laboratory medicine: anatomical pathology, general pathology, hematological pathology, neuropathology and undifferentiated lab medicine.

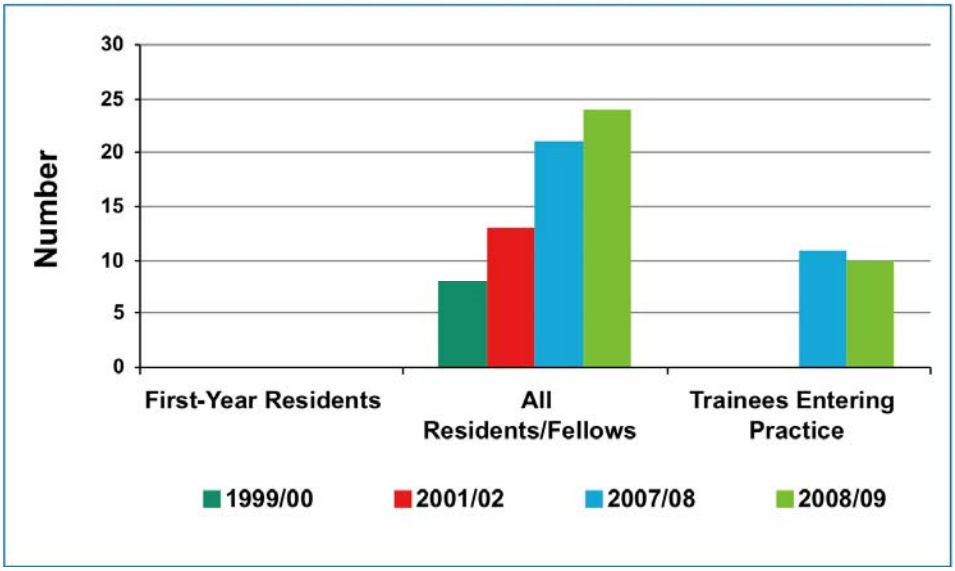
13 Data for 1995-1996, 1999-2000 and 2001-2002 was provided as special runs to the project.

Figure 6 –
Numbers of Residents In First-year Post-Graduation, Total Residents, and Trainees Entering Practice, Canada, 1995-96, 1999-00, 2001-02, 2007-08, 2008-09 Family Medicine



Source: CAPER, 2008.

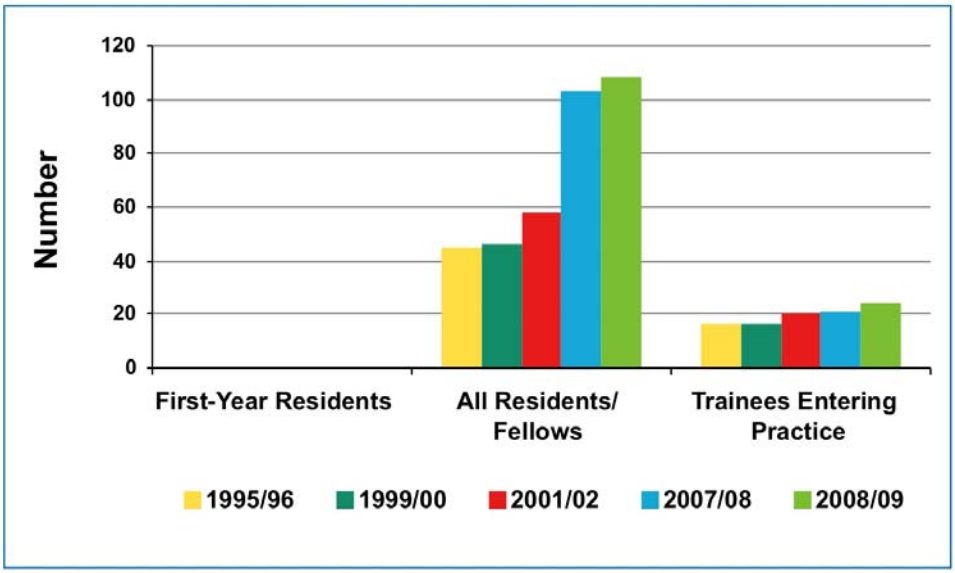
Figure 7 –
Numbers of Total Residents and Trainees Entering Practice, Canada, 1995-96, 1999-00, 2001-02, 2007-08, 2008-09
Palliative Medicine



Source: CAPER, 2009.

*Data are not available for first-year residents as palliative medicine residencies are not available in that year; similarly, data are not available for 1995-96 as palliative medicine residencies did not exist.

Figure 8 –
Numbers of Residents In First-year Post-Graduation, Total Residents, and Trainees Entering Practice, Canada, 1995-96, 1999-00, 2001-02, 2007-08, 2008-09 Medical Oncology

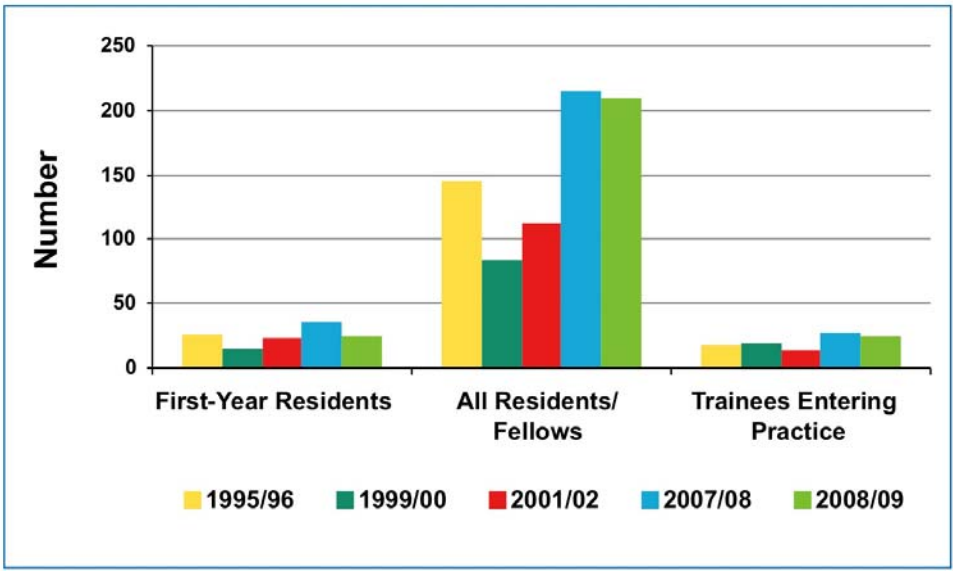


Source: CAPER, 2009.

*Data are not available for first-year residents as medical oncology residencies are not offered in year one.

For medical oncology, the total number of residents and fellows more than doubled between the first two and last two years, from 45 in 1995-1996 to 108 in 2008-2009. The number of trainees entering practice also increased, but less rapidly — from 16 in each of the first two years up to 24 in 2008-2009 (Figure 8). By contrast, more fluctuation occurred in the trends for radiation oncology. Here, the total enrolment decreased between 1995-1996 and 2001-2002 from 145 residents and fellows to 113, and then increased to 209 in 2008-2009. The number of first-year residents also fluctuated, between a low of 15 in 1999-2000 and a high of 35 in 2007-2008. While just 13 trainees entered the practice of radiation oncology in 2001-2002, this rose to 27 in 2007-2008 and 25 in 2008-2009.

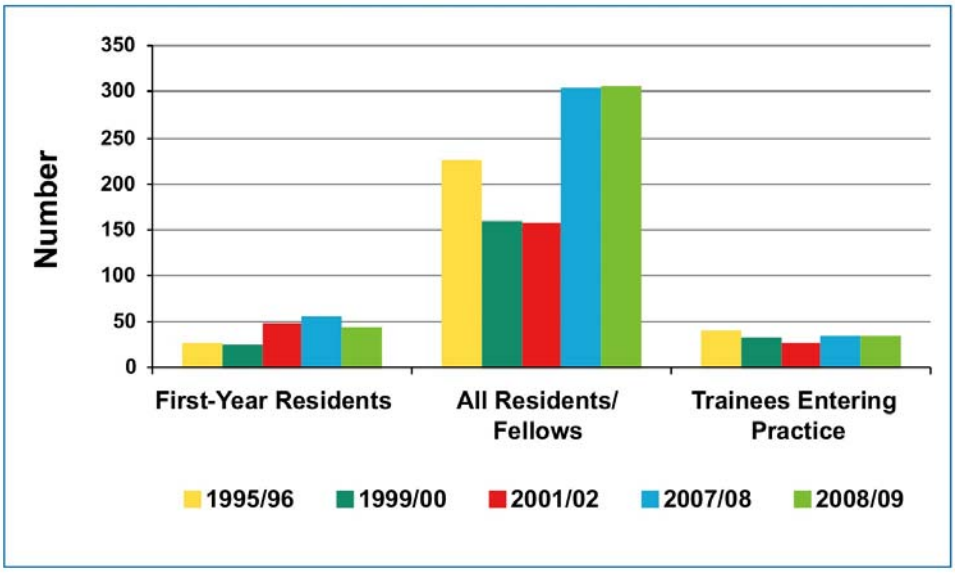
Figure 9 –
Numbers of Residents In First-year Post-Graduation, Total Residents, and Trainees Entering Practice, Canada, 1995-96, 1999-00, 2001-02, 2007-08, 2008-09 Radiation Oncology



Source: CAPER, 2009.

Total enrolments in the pathology specialties decreased since 1995-1996 from 226 residents and fellows in 1995-1996 to 158 in 2001-2002, but then increased to 307 in 2008-2009. First-year residencies increased from 27 in 1995-1996 to 55 in 2007-2008 and 44 in 2008-2009. By contrast, the number of trainees entering practice fluctuated during this period, with a high of 39 entering practice in 1995-1996, dipping to 26 in 2001-2002 and then rising to 35 in each of 1007-2008 and 2008-2009. Pathologists consulted for the CWSS pointed out the need to increase the attractiveness of pathology to potential residents. One pathologist said that three years ago more candidates were entering pathology studies. However, these candidates were being recruited to work in laboratories before completing their sub-specialization. This would affect their capacity to perform specialized investigations in the future.

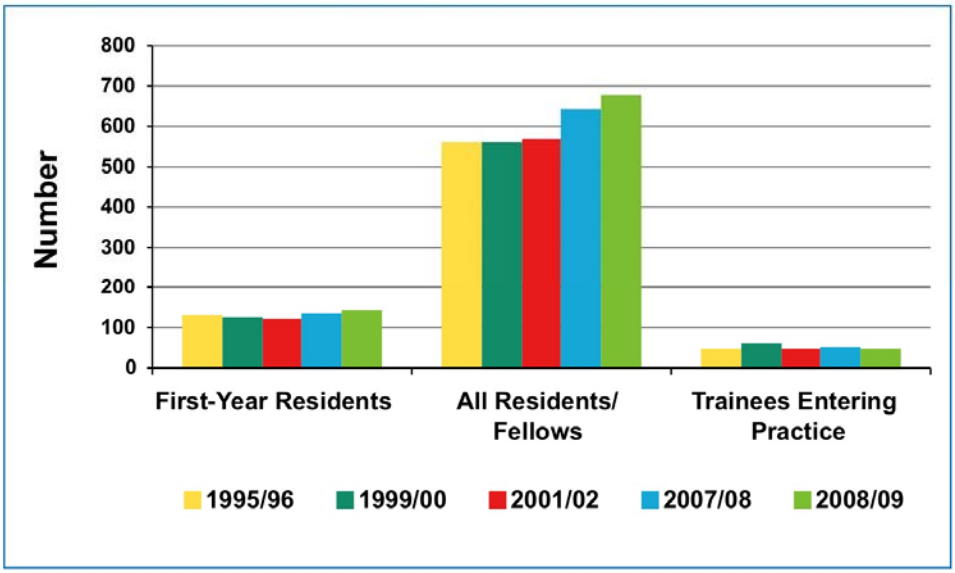
**Figure 10 –
Numbers of Residents In First-year Post-Graduation, Total Residents, and Trainees Entering Practice, Canada, 1995-96, 1999-00, 2001-02, 2007-08, 2008-09 Pathology**



Source: CAPER, 2009.

Trends for general surgery were generally stable due in part to the larger numbers involved. The number of first-year residents ranged between 130 in 1995-1996 and 122 in 2001-2002, and then increased slightly to 143 in 2008-2009. The total number of residents and fellows remained at just over 560 in the first three years selected, then increased to 645 in 2007-2008 and 678 in 2008-2009. However, trainees entering practice fluctuated with a low of 46 recorded for 2001-2002 and a high of 63 in 1999-2000 (Figure 11).

Figure 11 –
Numbers of Residents In First-year Post-Graduation, Total Residents, and Trainees Entering Practice, Canada, 1995-96, 1999-00, 2001-02, 2007-08, 2008-09 General Surgery

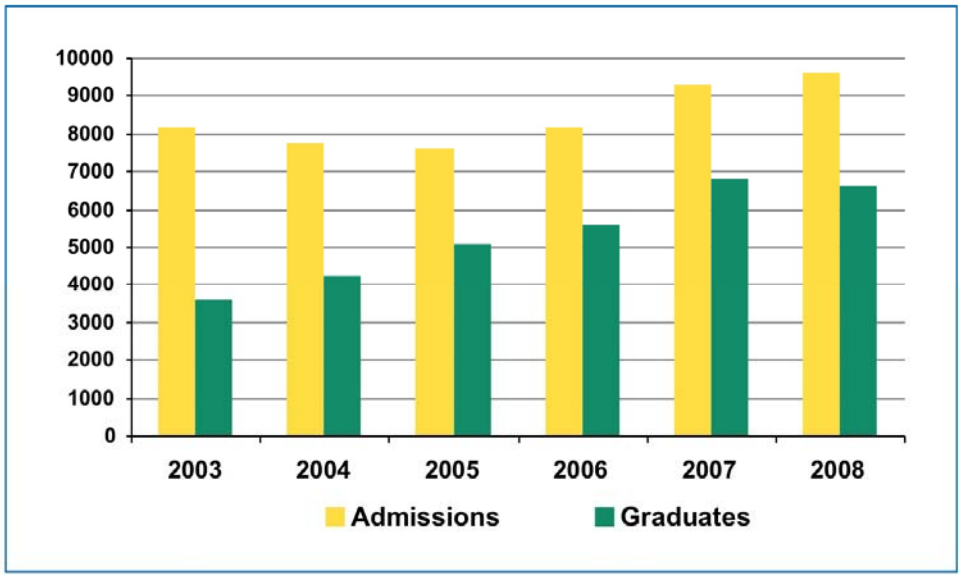


4.3.2 Increasing enrolments and graduates — nurses

A total of 87 baccalaureate nursing, 41 post-registered nurse (RN), 31 master's level and 13 doctoral programs were offered across Canada in 2007-2008 (Canadian Nurses Association and Canadian Association of Schools of Nursing, 2009). Québec's *Collèges d'enseignement général et professionnel (*CEGEPs) offer most of the 46 diploma programs that provide two years post-grade 11 education at the college level, a requirement for university entrance. Manitoba, Alberta and the Northwest Territories have diploma programs. Nurse practitioners were trained in one of 29 programs in Canada in 2007-2008.

A total of 9,632 students were admitted into baccalaureate nursing programs in 2007-2008, an increase of 18 per cent since 2002 — 2003. Since reaching a low of 7,638 in 2004-2005, admissions to the baccalaureate program have risen steadily. In 2008, 6,632 students graduated from baccalaureate nursing programs, close to double that of the 3,601 graduates for 2003. The slight decline in graduates in 2008 reflects the lower admissions in earlier years (Canadian Nurses Association and Canadian Association of Schools of Nursing, 2009) (Figures 12, 14 and 15).

Figure 12 –
Nursing Baccalaureate Programs: Admissions and Graduates, Canada 2003-2007

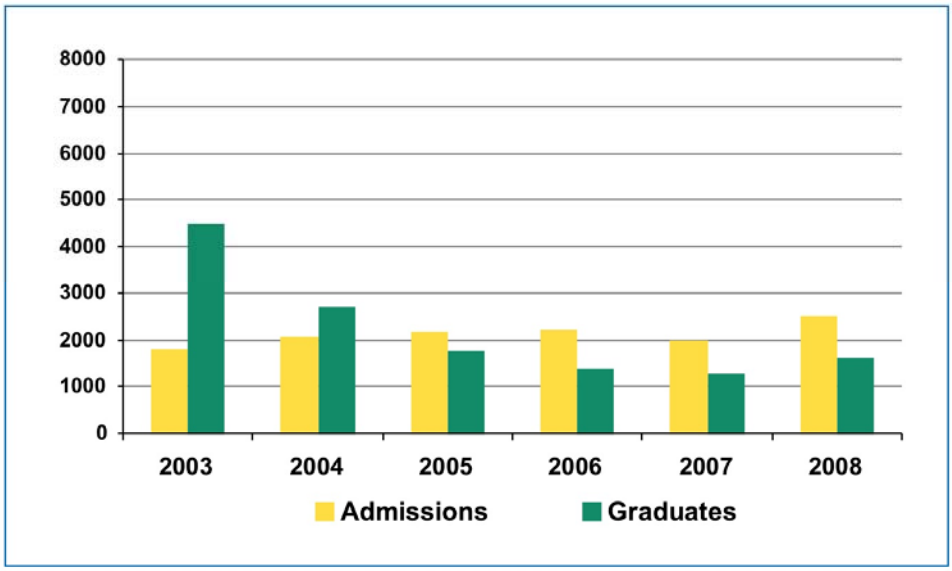


Source: Canadian Nurses Association and Canadian Association of Schools of Nursing, 2009

Trends fluctuated for diploma programs. Since 2002-2003, the number of students admitted into a diploma program increased each year until 2006-2007, when the numbers declined by 10 per cent to 1,984, a figure still higher than the 1,792 admitted in 2002-2003. This trend reversed in 2007-2008, when the number of admissions climbed to 2,497. This was due, in part, to increased enrolment in diploma programs in Québec. By contrast, the number of graduates from diploma programs decreased each year to just 1,280 in 2007, representing a 71 per cent decrease from 2003. It increased again to 1,624 in 2008 (Figures 13, 14, 15).

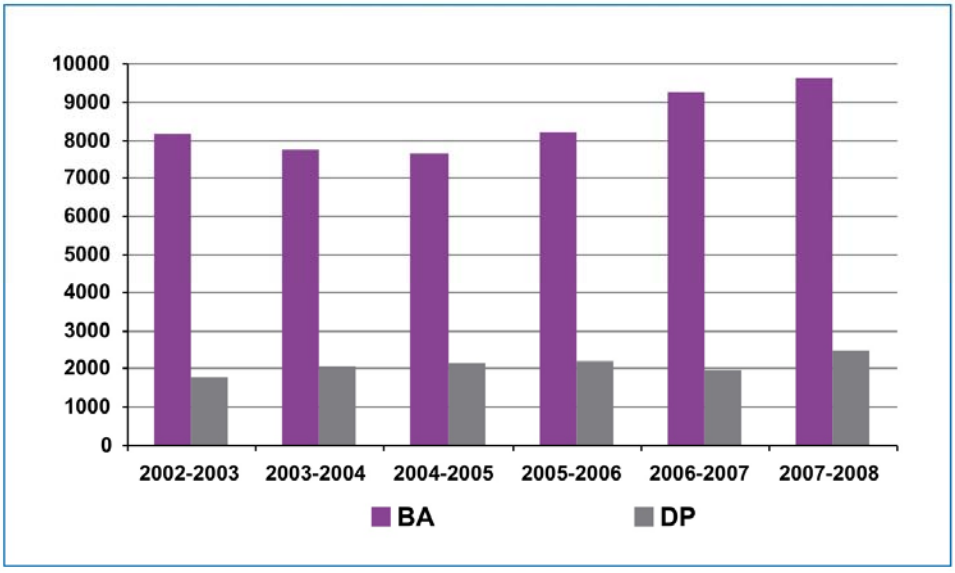
Admissions into master's degree programs increased to 977 students in 2007-2008, increasing by 67 per cent from 2002-2003. The number of master's degree program graduates also increased in 2008: 723 candidates graduated in 2008 — a 67 per cent increase since 2003 (Canadian Nurses Association and Canadian Association of Schools of Nursing, 2009).

Figure 13 –
Nursing Diploma Programs: Admissions and Graduates, Canada 2003-2007



Source: Canadian Nurses Association and Canadian Association of Schools of Nursing, 2009.

Figure 14 –
Trends in Admissions for Baccalaureate and Diploma Programs in Nursing, Canada, 2003-2007



Source: Canadian Nurses Association and Canadian Association of Schools of Nursing, 2009.

Figure 15 –
Trends in Graduates from Baccalaureate and Diploma Program in Nursing, Canada 2003-2007

Source: Canadian Nurses Association and Canadian Association of Schools of Nursing, 2009.

There were similar trends for the number of students admitted into nurse practitioner (NP) programs, although some year-to-year fluctuations sometimes occur. In 2007-2008, about 353 students were admitted into NP programs, an 8 per cent decline from the previous year, but more than double the total enrolment of 155 in 2002-2003. The number of students graduating from NP programs has greatly increased from 70 students in 2001 to 231 in 2003, then to 330 students in 2007 and 272 in 2008 (Canadian Nurses Association and Canadian Association of Schools of Nursing, 2009).

4.3.3 Lack of information for radiation therapy and medical physics

Unfortunately, the CWSS did not find similar trend data on the number of enrolments and graduates for radiation therapy and medical physics programs. Results from the interviews conducted with educators involved in the two programs indicate that, in the last two to three years, enrolments and the number of students graduating from the programs have increased.

The need continues to produce more graduates and, hence, increase enrolments to meet the workforce demand in the medium- and long-

term. Most health care providers and managers interviewed in the CWSS voiced concern that the production of new health care providers will not keep up with the volume increases of patients and survivors. This is supported by the Nursing Education Statistics report for 2006-2007. Although the number of graduates has increased over the last five years, the gap between the current outputs of nursing students (in 2008) is still far from meeting the recommended 12,000 graduates per year required to meet the shortages.

4.3.4 Continuing professional development

Continuing Professional Development (CPD) is typically a requirement for many health care professions. CPD and Continuing Medical Education (CME) are mandatory for physicians for "*maintenance of certification*" by the RCPSC and the CFPC (Malatest Program Evaluation and Market Research, 2006). For nurses, the ability to continue to learn and develop has an impact on their remaining in the workforce (O'Brien-Pallas et al., 2004). New learning technologies offer opportunities to learn at one's own pace and time but, nonetheless, still require the time of people who already have full workloads.

Many national and professional organizations provide listings and information on courses, seminars and conferences to support health care providers in their continuous learning and training. For example, the CNA continuing education database identifies four schools that offer post-licensure continuing education in oncology nursing.[14] The Canadian Association of Nurses in Oncology also provides a list of nursing courses that have a focus on oncology. Interestingly, schools outside Canada offer four of the six courses currently listed on the website. The two Canadian programs include an online or correspondence with practicum oncology nursing certificate program at Loyalist College in Ontario, and a distance education palliative care nursing course that St. Francis Xavier University in Nova Scotia offers.

The educator respondents for the CWSS agreed that opportunities exist for continuous learning for faculty to develop their knowledge and skills. There are budgets for faculty to attend and/or present at conferences or similar events and there are online courses. A number of respondents mentioned that faculty development is not an issue since faculty is involved in research activities and, thus, is at the forefront of new developments and technologies. This is especially true for medical

14 These are the Cambrian College of Applied Arts and Technology in collaboration with Laurentian University, Loyalist College in collaboration with Brock University, Mohawk College in collaboration with McMaster University, and the Sault College in collaboration with Laurentian University.

physicists who are very much involved in leading edge research. However, some faculties are so pressed for time to develop and deliver new and innovative courses, research time is suffering.

In other cases, faculty members work both in academia and in clinical practices and, therefore, have continuous exposure to changes and issues in the work environment. Cancer centres also offer opportunities through seminars and medical rounds for staff to keep up-to-date. Faculty members are able to observe the latest and newest technologies and modalities in radiation therapy. This helps them maintain their knowledge and translate this into the curricula they teach.

Nursing leaders have close working relationships with faculty members, thereby increasing faculty members' knowledge about the oncology nursing practice and encouraging faculty to introduce students to oncology nursing during the formation of their professional identities. This increases the likelihood that students will consider oncology nursing, and the organization, when selecting a first job experience. This was also experienced by one nursing leader and educator consulted for the CWSS. Working with a local hospital, this nurse was able to secure clinical placements for the handful of baccalaureate nursing students during their educational training. All of these students were then recruited to work in oncology in other centres. Their experience specific to oncology was very much in demand.

4.3.5 Increased use and consideration of alternative learning methods/distance learning

Educators consulted in the CWSS reported that educational institutions are looking at alternative learning methods to deliver their programs, given the need to produce more graduates, reach more remote and rural communities, respond to scheduling issues with busy practitioners, overcome the unavailability of physical space and work within funding constraints. Some are exploring online training or e-learning as a method to deliver courses to students, particularly those in remote and rural regions, a process that is well underway at Lakehead University in Thunder Bay. Others (e.g., the University of Western Ontario) may consider developing a "virtual education" environment for medical physicists in the future by creating network centres allowing programs to share in the lectures.

Online training has become a major industry. Many industry observers acknowledge online training as the way of the future. It offers many benefits over conventional, in-classroom instruction, including:

- uniform training delivery without dependence on specific instructors or training environment
- flexibility to take training whenever wanted
- ubiquitous delivery, allowing students in remote locations to receive training without being affected by proximity to the trainer or training organization
- savings (e.g., reduced need for travel, training taken outside work hours and course materials available online)
- online tests providing assurance that training has resulted in learning (Convergence Management Consultants Inc., 2005).

In the 2006-2007 academic year, 62 distance education nursing programs were offered electronically in full or in part. While this number did not change from the previous year, there was a 51 per cent increment in the number of programs over 2004-2005 (Canadian Nurses Association & Canadian Association of Schools of Nursing, 2007). Of these 62 programs, there were 37 baccalaureate, 19 master's level and six doctoral level programs. Despite the increase in graduates, several schools are adopting new technologies and approaches to prepare nurses in less than the traditional four years, given that the current and future number of graduates will not meet the expected demands.

Alternative and innovative ways to deliver training and education to radiation therapists are also being considered, especially by radiation therapy programs in Canada. Recently, program faculty discovered technology that will create a virtual environment of a radiotherapy treatment (VERT) room (see www.vertual.co.uk). VERT was created to address a crisis in England for training students and staff in the radiotherapy treatment of cancer. VERT employs graphics and life-size visualizations to deliver radiotherapy training to students, nurses and existing staff (Phillips et al., 2008). It provides the trainee with models, simulation, enhanced visualization and training aids for treatment of virtual patients in a virtual treatment room. The University Aarhus Hospital in Denmark and the Birmingham City University in the United Kingdom are currently using immersive VERT[15] for training purposes.

In an effort to reach out to remote locations, the Northern Ontario School of Medicine (a new medical school for northern Ontario) has multiple teaching and research sites across large and small communities in northern Ontario and employs broadband technology to bridge the distance among various remote sites, Thunder Bay and Sudbury. The four-year Undergraduate Medical Education e-curriculum is a Virtual Learning Environment (VLE). The latest technologies to deliver training

15 The first level of VERT training that is designed for large training centres.

such as videoconferencing, webcasting, online tutorials and the resources available through the Health Information Resource Centre[16] support VLE. It also facilitates an extensive distributed learning model that is unique in modern medical technology.

Online training is also being used to deliver continuous development/ learning to health care professionals. MDcme.ca is an example of such online training offered to physicians. MDcme is a consortium of 14 Canadian medical schools and the College of Family Physicians of Canada (CFPC). It attempts to provide choices to physicians about continuing medical education (MDcme, undated).

Two course formats were developed to accommodate different learning styles:

- Small group-facilitated environment — this more traditional approach to learning allows participants to interact with course materials, other participants registered in the course and a trained facilitator during specific times.
- eCME on Demand — this non-traditional approach to training allows participants to begin their training "anytime" and "any place." Case management approaches are provided in a self-directed environment. Asynchronous discussion boards and an "e-mail a specialist" function permit participants to consult a subject matter expert.

Both approaches are online-based. However, there is more interaction in the first format. The second format gives participants the flexibility to take their training on their own time.

Currently, an online oncology course is scheduled, with a second session forthcoming. Launched in 2007, the goal of OncologyEducation.ca is to improve patient care through education by providing an educational resource for medical oncology professionals (Northern Ontario School of Medicine, undated). The site provides key resources such as reports on the latest advances in the literature, conference updates, disease-site-specific information and updated information to support medical oncologists in their clinical practice and with their educational needs. A Canadian Medical Oncologist database is also featured. To date, 60 per cent of medical oncologists across Canada are registered on the site (reported by a CWSS respondent, a medical oncologist).

Offered through the Cross Cancer Institute, the Oncology Nursing Distance Education Course (ONDEC) is a comprehensive distance

16 The Health Information Resource Centre is a national clearinghouse for consumer health programs and materials.

education resource that meets the educational needs of nurses who care for patients with cancer and their families. (Oncology Nursing Distance Education Course (ONDEC), 2007). Nurse educators at the institute offer this eight-month, self-study, tutor-supported course. The course curriculum includes information on carcinogenesis from early detection and diagnosis to recovery or death. It is complemented by peer-reviewed journal publications and a comprehensive oncology nursing text. More than 900 nurses from Canada and worldwide have enrolled in the program since its inception in 1990. There are a number of other certificate programs for nurses in Canada.

4.3.6 Increased consideration of alternative clinical practice experience

An increasing number of health sciences programs are seeking to utilize simulated clinical learning experiences to respond to the need of increasing enrolment and address the challenges associated with this, mainly securing clinical placements. The trend to employ simulation is rapidly increasing in professional healthcare education practice (Smith et al., 2007). In 2005, the Ontario Ministry of Health and Long-Term Care invested $10 million in clinical simulation equipment to improve the education of nurses, making it the first province to embrace this innovation in nursing education (Ontario MOHLTC, 2005).

Simulated clinical learning experiences offer significant benefits over traditional training methods by providing:

- a safe environment for patients and students during risky procedures
- unlimited exposure to rare and complicated clinical situations
- opportunities to plan training rather than wait for an appropriate situation to arise
- the opportunity to standardize and evaluate performance
- the ability to provide immediate feedback
- the ability to repeat performance
- the opportunity to organize team training (Smith et al., 2007) (Grenvik, Schaefer, DeVita, & Rogers, 2004).

Simulation is used mainly in undergraduate education, followed by continuing professional development. It is least used in graduate studies (Canadian Association of Schools of Nursing, 2007a). The Michener Institute for the Radiation Therapy program introduced clinical simulation in the second year of the undergraduate program, before students enter clinical placements. Simulation methods will also be used to deliver an inter-professional leadership course that the institute will offer. Other educator respondents in the CWSS cited the potential

to use simulation methods to deliver inter-professional education and training. The *Inventory of the Use of Simulated Clinical Learning Experiences and Evaluation of their Effectiveness* (the *Inventory*) concludes that there is increasing interest in using simulation for inter-professional training (Smith et al., 2007).

Results from the *Inventory* indicate that classroom-based simulation is the predominant method for role-play exercises in communication skills and simulated care management skills. High-fidelity simulators are used to train students in a wide range of clinical procedures in medical education such as suturing, intubation, laparoscopic surgery and endoscopy. Such simulators are also used for complex, team-based scenarios such as surgical simulations in a simulated operating room. Increasingly, they are being used in nursing education for higher order skills development such as critical thinking/clinical problem solving and teamwork involving complete client-centred simulations.

The educators consulted in the CWSS view simulation as a way to augment clinical placements but never to replace them. Most agree that this may reduce the amount of time that students spend in a clinical setting. Simulated learning was used by 70 per cent of the respondents in the *Inventory* to augment the clinical learning experience (Smith et al., 2007). None of the survey respondents in the *Inventory* completely replaced any practical experiences with simulation and 32 per cent of the respondents did not think that simulation can totally replace clinical practical experience.

There continues to be debate about the effectiveness of simulation as a teaching method and for reducing cost. Although not conclusively proven, there is general acceptance of the effectiveness of simulation in improving client safety. Determining the cost benefit of simulation is challenging — many of the benefits are difficult to quantify in terms of monetary value (e.g., improved patient safety and better-prepared students).

To address the challenges with practice placements in the health sciences disciplines and with inter-professional placements, the BC Academic Health Council launched the Health Sciences Placement Network of BC or HSP*net* in 2003. HSP*net* provides a web-enabled database and tools to:

- Increase the availability and quality of practice education opportunities for students.
- Streamline processes and improved communications of those involved in practice education.
- Enhance access to a greater range of placement opportunities.

- Evaluate and improve learner and agency outcomes.
- Enhance the profile and priority of practice education (HSPnet, 2008).

Six provinces currently use HSP*net* to manage their practice education in health sciences. These provinces share the costs of HSP*net* through the National HSP*net* Alliance — created in 2004 to ensure that HSP*net* is accessible and affordable, improves quality and reduces per-placement cost over time. More than 2,000 Canadians are HSP*net* users, representing educational programs in various disciplines, health authorities and private agencies. HSP*net* has helped to:

- Improve communication and information exchange among schools and agencies.
- Reduce the handling of paper through access to electronic placements.
- Improve turnaround time on placement requests.
- Provide reporting and productivity tools.
- Enhance the ability to plan and build capacity.

4.3.7 Innovations in remuneration structures of faculty

Most educators consulted in the CWSS agreed that impending retirements of faculty members are a concern for the next five years. Some programs are recruiting new faculty to meet the twin demands of increased enrolments and attrition. Remuneration is a key issue, as clinical practice pays more than the academic stream.

Faculties are recognizing the need to become more competitive and are exploring innovative ways to meet this challenge. One method under consideration is to provide time for faculty to both teach and practice. This not only helps bolster faculty compensation but also provides a mechanism for faculty to maintain their knowledge and skills and bring these back into the classroom setting. This approach especially benefits radiation therapy and medical physics where technology is evolving rapidly. However, as several medical physicists pointed out to the CWSS, most medical physicists are very much involved in research to explore new technologies and techniques. This model of teaching and practicing will lead to job satisfaction and enhanced quality of work, as noted by one educator consulted for the CWSS.

4.3.8 Integrating inter-professional/disciplinary education for collaborative patient-centred practice into health sciences programs

Inter-professional/disciplinary education has received much attention in the last five years following the 2002 *Romanow Report* and the 2003 First Ministers' Accord on Health Care Renewal**.** Inter-professional education (IPE) is defined as occurring when two or more professions learn with, from or about each other to improve collaboration and the quality of care (CAIPE, 2008). the *Romanow Report* and the First Ministers' Accord stressed the need for appropriate planning and management of health human resources to ensure that Canadians have access to the health care providers they need today and in the future (Health Canada, 2007b). According to the *Romanow Report*, the "direction of our (Canada's) health care system must be shaped around the needs of individual patients, their families and communities," thus leading to the recommendation that current education and training programs for health care providers be reviewed to assure greater integration of education programs (*Romanow*, 2002).

The Inter-professional Education for Collaborative Patient-Centred Practice (IECPCP) initiative is one of three critical areas of the Pan-Canadian health human resources strategy developed since the *Romanow Report*. The IECPCP's objectives are to:

- Promote and demonstrate the benefits of inter-professional education for collaborative patient-centred practice.
- Increase the number of educators prepared to teach from an inter-professional collaborative patient-centred perspective.
- Increase the number of health professionals trained for collaborative patient-centred practice before, and after, entry-to-practice.
- Stimulate networking and sharing of best educational approaches for collaborative patient-centred practice.
- Facilitate inter-professional collaborative care in both the education and practice settings (Health Canada, 2007b).

Health Canada defines collaborative patient-centred practice as:

> "the practice designed to promote the active participation of each discipline in patient care. It enhances patient and family centred goals and values, provides mechanisms for continuous communication among care givers, optimizes staff participation in clinical decision making within and across disciplines and fosters respect for the disciplinary contributions of all professionals" (Health Canada, 2007b)."

Most programs for the 10 occupations that the CWSS reviewed are in the early stages of integrating IPE into their programs. The University of Alberta is the only Canadian university where health sciences students are required to take a course in interdisciplinary education as part of their program (Oandasan et al., 2004). One CWSS respondent reported that the requirement for IPE means joint planning of programs across occupation-specific training groups to ensure common elective time to complete IPE. Newer delivery models, such as family health teams, lend themselves to IPE. However, learning outcomes need to be considered especially for nurses, and evaluative research is needed to ensure program relevance and effectiveness. Further, establishing balance on teams was a challenge due to the greater numbers of nurses in comparison to other professional groups. Another CWSS respondent declared that IPE should be needs based, linked to practice setting and relevant to context. Most CWSS respondents indicated that the role of other health care providers is taught within the program, while students are interacting and working in teams with other health care professionals as part of the clinical placements.

Since September, 2007, the Michener Institute's Radiation Therapy program, in collaboration with the University of Toronto, includes 6.5 credits of IPE courses. These courses include:

- Foundations of Inter-professional Collaboration I — Communication
- Foundations of Inter-Professional Collaboration II — Professionalism
- Inter-professional Collaborative Research
- Inter-professional Collaborative Patient-Centred Care
- Inter-professional Collaborative Simulation
- Inter-professional Collaborative Leadership.

Professors from a number of different professions deliver the tutorial-based courses to students who are also from mixed health discipline programs that the Michener Institute offers. The Michener Institute's Radiation Therapy program, in collaboration with Laurentian University, has not yet incorporated IPE into its program. Two reasons for this slow integration are the physical locations of the health sciences programs (not close together) and the lack of infrastructure.

In response to a 1999 and 2000 needs assessment that included consultations with patients, Cancer Care Nova Scotia (CCNS) developed the Inter-professional Core Curriculum to train community-based health professionals that are non-cancer specialists (e.g., general practitioners, VON, home care staff, and local pharmacists) and primary care health professionals (Cancer Care Nova Scotia, 2005). The curriculum comprises a series of inter-professional educational modules

that are interactive and cover the topics of pain management, symptom management, treatment and side effects. Typically, cancer or palliative care content experts deliver the modules to health professionals in three and a half hour workshop sessions.

Usually, two facilitators from two different professions receive training to deliver the modules. The requirement to obtain CCNS' pre-approval of any content modifications maintains program integrity and consistency. CCNS is considering adding more information on inter-professional collaboration (e.g., communication, conflict management) in some modules to recognize the importance and need for such training among health care providers.

4.3.9 Enhancing programs and courses

Ensuring that students are graduating with the necessary skills and knowledge to meet the current and future health care demands in cancer control is essential. McMaster University in 2005 revamped its undergraduate medical program to update its curriculum. This three-year program includes a more integrated clinical and classroom level curriculum for oncology, which is a new feature for this program. According to two medical oncologists consulted for the CWSS, this exposes students to oncology at the undergraduate level, which is needed to attract candidates to a career in oncology. One CWSS respondent reported on future plans to create a national curriculum for medical oncologists.

A very limited number of educational programs for oncology nursing exist in Canada. In contrast, there are a number of educational programs to prepare nurses at basic, specialty and advanced levels in oncology nursing offered throughout the United States (The Systemic Therapy Task Force, 2000). In Canada, specialty nursing is acquired post-RN licensure. The basic nursing program pre-licensure prepares generalist nurses. There are several post-licensure certificate programs in Canada such as those offered at Loyalist and Mohawk Colleges. In most cases, individual nurses take the initiative to undertake special preparation for oncology through a series of continuing education programs and events.

The recent development of an oncology stream at the University of Ontario Institute of Technology (UOIT) School of Nursing provides nurse graduates the opportunity to work in oncology. Although small in numbers, students enter oncology clinical practice in year two of their studies. Students are placed with nurse preceptors who work in oncology or palliative care. These students are also required to work on a health promotion oncology project. Because implementation of the

oncology stream is quite recent, it is too early to assess its success. However, most of the recent nurse graduates who specialized in oncology have found work in their specialty.

In 1999, the RCPSC and the CFPC conjointly accredited a one-year residency program in palliative medicine to formalize the training process in Canada. Of the 17 medical schools, 12 now offer accredited fellowship programs. Many of the country's faculties of medicine have established divisions of palliative medicine within their academic departments (Shadd & Pilkey, 2007). Recognizing the need to educate health professionals on end-of-life care, the Canadian government announced its support for palliative care at the 15th International Congress on Care of the Terminally Ill (Benady, 2004). By 2008, every medical school in Canada must incorporate end-of-life care as a discipline in its curriculum. All medical students and residents will receive training in end-of-life care and be evaluated on it in their final exams by 2008. The Educating Future Physicians in Palliative and End-of-Life Care (EFPPEC) project, working with the Ontario Palliative Undergraduate Network and the Réseau Universitaire Québecoise des Soins Palliatifs, developed an undergraduate curriculum in palliative and end-of-life care based on the EFPPEC competencies and their own work (Casiro, 2007).

Medical physicists consulted in the CWSS questioned whether the current curricula for medical physics education — a "one size fits all" approach — is sufficient in the advent of sub-specialization. Programs will need to account for the emergence of sub-specialties in medical physics, as is occurring in the workplace today.

Pathology training requires considerable revamping to meet the current advances in the discipline. Greater emphasis is needed on molecular biology, new molecular tools and personalized treatment such as the assessment of growth factors on tumours. Pathologists also need to learn more about the clinical and technical side of oncology through interaction with clinical and laboratory colleagues.

The new competency profile for radiation therapists that comes into effect with the 2011 Certification Exams from the CAMRT will have an impact on educational programs for radiation therapy and in the workplace. The CWSS consulted a number of educators involved with radiation therapy programs. They commented that they are currently reviewing the new competencies to understand the implications for their current programs. The new competency requirements are much more detailed and broken down in comparison to the previous profile that rolled up competencies into broader categories.

With the emergence of new roles for the cancer control workforce comes the need for the development of new training programs and courses. For example, there are no formal training programs available for general practitioners who wish to pursue the role of general practitioners in oncology (GPOs). This has led to the creation of a self-directed learning program in Ontario to assist general/family medicine physicians who currently work or plan to work in an oncology setting (Cancer Care Ontario, 2006).

4.3.10 Programs for rural and remote areas

New programs are being established to train people in rural and remote communities with the hope that many of the graduates will choose to work there. The patient groups that the CWSS consulted identified the need to address challenges to access in cancer care in remote regions of the country. For residents and patients in remote areas, including First Nations and Inuit communities, the obstacles they face when seeking screening and/or treatment in more distant, larger centres are sometimes so great that they do not make the effort. These obstacles include travel time and costs, accommodation, loss of salary, safety of roads in winter and finding care for dependents in the patient's or family member's absence.

An example of a program to train physicians for rural and remote communities is the Northern Ontario School of Medicine (NOSM) which opened in September 2005. The new school has a strong emphasis on the special features of care delivery in Northern Ontario (Northern Ontario School of Medicine, undated). Its mandate is to be socially accountable to the cultural diversity of the region it serves namely, aboriginal, francophone and remote communities, small rural towns, larger rural communities and urban centres. NOSM's learning approach is patient-centred. It focuses on people in their home, family and community context through case-based learning. Students learn in large and small hospitals, health services, family practices and various community centres.

The undergraduate MD program at NOSM is clinically driven. It ensures that students gain a strong grounding in core knowledge and skills, including the basic sciences. Residency programs are offered in the communities throughout Northern Ontario through collaboration with McMaster University and the University of Ottawa. In 2006, the College of Family Physicians of Canada granted "new program status" to the school's Family Medicine Residents of the Canadian Shield program (FM RoCS). Students undertake clinical learning in Northern Ontario communities in this two-year residency program. NOSM's goal is to graduate medical generalists who are innovative, resourceful, self-

reliant, culturally and emotionally sensitive, and who are acquainted with the rigours and rewards of medical practice in northern, remote and culturally diverse settings. The hope is that these graduates remain to provide medical care to northern communities.

The Northern Medical Program at the University of Northern British Columbia (UNBC) in Prince George is a similar program. The Northern Medical Program is a partnership between the University of British Columbia (UBC) and UNBC (University of Northern British Columbia, 2008). This program is an integral part of the expansion of UBC's Faculty of Medicine and is vital to meeting the needs of northern communities for health care professionals. Employing a combination of videoconferencing and internet technology, face-to-face instruction and learning from local physicians in various healthcare settings across northern BC, the goal of the program is to train physicians in the north for rural and northern practice. The first cohort of medical students graduated in the spring of 2008.

Educators consulted in the CWSS recognized the need to incorporate leadership training to equip graduates with the knowledge and skills to function in multidisciplinary teams. Communication skills, conflict resolution and management training are other skill requirements identified. These skills lend themselves to IPE, as they are required of all health care professionals. Managers and educators consulted in this study also identified the growing need to prepare students to manage and work with different information technologies such as electronic health records. Such skill and knowledge will be essential as more practices implement information technologies to create more efficient and effective processes in the workplace.

4.3.11 The need for advanced practice education

A number of health disciplines are looking at advanced practice roles to better serve patients, respond to critical needs and provide opportunities for advancement for health professionals. For example, advanced nursing practice, in place in Canada since the 1970s, involves two advanced nursing programs — for clinical nurse specialists and nurse practitioners. The clinical nurse specialist emerged as patient care became more complex. The nurse practitioner gained formal recognition when policy-makers recommended this role as a way of providing healthcare to isolated populations (Canadian Nurses Association, 2008). However, the role of the clinical nurse specialist almost disappeared with the elimination of many positions during health budget cutbacks in the early 1990s. In addition, interest in deploying nurse practitioners was lost due to a perceived oversupply of physicians, lack of enabling legislation and issues with remuneration.

However, there is renewed interest in advanced nursing practice, given the increased demands, knowledge, technological advancements and the need for integrated care. The first edition of the *Advanced Nursing Practice: A National Framework* was published in 2000. A 2002 revision incorporated the graduate degree in nursing as the minimum educational requirement for advanced nursing practice (Canadian Nurses Association, 2008).

Radiation therapists identified the need for graduate level work in radiation therapy. They reported to the CWSS that many therapists are taking master's degree level training in other disciplines to create more opportunities for their long-term careers. The Ontario Radiation Therapy Advanced Practice (ORTAP) collaborated with the University of Toronto's Department of Radiation Oncology to establish the first Master of Health Sciences (Medical Radiation Sciences) program in Canada. Launched in 2009, the two-year, full-time graduate program resides in the Institute of Medical Sciences of the Faculty of Medicine, run in close collaboration with the Department of Radiation Oncology at the university. Program faculty members are drawn from the Department of Radiation Oncology. They include radiation oncologists, medical physicists and a group of academic radiation therapists who have faculty appointments in the university's Faculty of Medicine. While the initial expected capacity of students for the first cohort is a maximum of five students, eventually, the program will aim for full capacity at 10 students. The program also plans to modify its delivery method to a "distributed learning" format that can be accessed across the country.

4.4 Challenges

CWSS respondents identified many challenges in the education and training of current and future health care providers in cancer control. These include having the faculty to deliver the programs, ensuring preceptors are available to supervise and train (linked to accessing more clinical placements) and having the physical space, including medical laboratories, to deliver the necessary teaching and training.

4.4.1 Issues pertaining to increasing enrolments

The drive to increase enrolments to meet medium- and long-term demands has challenges. Increasing enrolments must be met with corresponding increases in faculty to deliver the teaching. There is limited information on the current faculty composition in all disciplines and on medium- and long-term needs. Educators that CWSS consulted

agreed on the need for more faculty members in their programs because faculty increases are not keeping pace with enrolment increases.

Physical capacity is another challenge. Some schools already suffer from a lack of classroom and laboratory space to accommodate the current student numbers. Opening new campuses is costly. Some potential innovative solutions include collaborating with other institutions or schools to deliver the curricula and looking at alternative ways to deliver learning and training. For example, some colleges offering nursing education now collaborate with universities who may deliver the final third and fourth year of a baccalaureate program, or just the final fourth year. The institutions depend on each other to deliver the necessary training for the student to graduate with the required knowledge and skills to be an RN.

Attracting the right people to enrol in programs is an issue. Several CWSS respondents reported vacant training spaces for mammography technicians, radiation therapists and medical laboratory technologists. Access to programs for training health records technicians was an issue in several provinces. In some disciplines such as surgical oncology, there is a similar situation for residency training. As the CWSS identified, there is a need for better matching of residents with preceptors and placements in surgical oncology.

Enrolment increases mean a need for more clinical placements. A number of educators said that the need to find and secure placements along with the corresponding funding requirements is often a barrier to providing more educational seats. In some programs, the challenge is to get clinical sites to commit to longer placements. Linked with this is the need to ensure the availability of preceptors to mentor these students. Most nursing schools across Canada are feeling this. "[The] reality for nursing schools in Canada is that costs must be addressed to maintain and expand clinical placements" (Smith et al., 2007). It is also an issue for physicians. In an upcoming project, a number of organizations will be investigating the issue of physician residencies and placements.

The availability of clinical placements directly affects the ability to increase student intakes to a program (L. Thompson, 2005). This includes residency positions for pathology, medical physics and oncology specialties. Securing clinical placements is increasingly competitive. Sites for placements are become more difficult to obtain across many of the health sciences. Many educators interviewed for the CWSS said they are already experiencing challenges in placing the current volume of students. They said that, in some cases, there is a mismatch of graduates/residents to placements. One educator in radiation therapy identified the limited availability of laboratory time for students to

practice. Even during "off" times, students still run into accessibility issues as the dosimetrists or radiation therapists are completing their work after hours. As a result, some educators are turning to simulation technologies to help alleviate these pressures. The opening of new cancer centres offers opportunities for new placements if the centre is able to recruit sufficient staff.

Finding preceptors to supervise students or residents on a one-to-one basis in clinical settings is a significant issue. Most educators consulted for the CWSS identified heavy workloads, increased demands on time, and lack of recognition for the additional responsibilities as factors that affect the availability of preceptors and ability to attract preceptors. Survey respondents identified the lack of preceptors as a barrier to finding clinical placements in the *Inventory Strategies to Deliver Nursing and Inter-professional Clinical Placements in Canada* report (Smith et al., 2007). Competing demands on existing preceptors' time challenges them in providing optimal supervision and guidance to the students they supervise. Survey respondents said that, often, the administrative duties that preceptors undertake (e.g., evaluating performance at different intervals, logging placement) are neglected or not of adequate quality. Radiation therapists noted that there is little time available during normal (paid) working hours for preceptors to train and evaluate their students. Preceptors need dedicated time to properly supervise and train students or residents.

Ensuring that preceptors get the necessary training themselves will both ensure the production of good preceptors and the optimal mentorship of residents and students. Most respondents in the CWSS who are involved in supervision reported that they had not received any training. For those who did, the training was limited to a few hours. Many respondents acknowledged that training is beneficial in providing guidance on constructively giving feedback to students and residents. Yet, these same respondents recognized that having the time to train is a challenge. Many did not receive any additional compensation for their role as preceptors. All the radiation therapists consulted for the CWSS commented that supervising students is part of their scope of practice and written into their contract. Recognition in the form of compensation can be an incentive to attract more preceptors.

4.4.2 Issues and challenges for faculty

Most educators that the CWSS consulted expressed concerns about having enough people to deliver the curriculum, evaluate, research and mentor — they indicated that they were not currently recruiting faculty members. However, this issue *is* getting attention, and will be over the next few years, due to the higher faculty retirement rates expected in

the medium-term. For the 10 occupations that the CWSS reviewed, there is a lack of national or provincial information data on the jurisdiction, supply and demand trends or age distributions, by cohort, of faculty members.

The *Task Force Two: A Physician Human resources Strategy for Canada's Occupational Human resources Data Assessment and Trends Analysis* (*Task Force Two*) report concludes that widespread concern exists over perceived *shortages* of clinical faculty at medical schools. This is based on anecdotal evidence in the absence of reliable data and information (Canadian Labour and Business Centre & Canadian Policy Research Networks, 2005).

Data from the Office of Research and Information Services of the Association of Faculties of Medicine of Canada (AFMC) show that:

- 11,265 full-time faculty members and 21,687 part-time faculty members were employed at a faculty of medicine in Canada in 2007-2008[17] (AFMC, 2009).
- Full-time faculty remained relatively constant between 1992-1993 and 2001-2002, at about 8,400 to 8,800 faculty in each year.
- Starting in 2003-2004, the number of full-time faculty has increased rather steadily by about 400 per year.[18]
- In 2007-2008, 272 full-time and 265 part-time faculty members taught in the oncology/medical oncology departments of the faculties of medicine. There were 114 and 35 full- and part-time faculty members, respectively, teaching in radiation oncology departments.[19] The haematology/haematology-oncology departments in 2007-2008 employed 94 full-time and 97 part-time faculty members (AFMC, 2009).
- In comparison, 677 full-time and 5,901 part-time faculty members taught family medicine, while 669 full-time and 1,410 part-time members delivered general and other surgery education.
- At a high level, the number of faculty is more or less keeping pace with the number of medical students, given an increase in the number of students/trainees of 47 per cent between 2000-2001 and 2007-2008. The number of full-time and part-time faculty increased by 41 per cent (CIHI, 2007d) (AFMC, 2009).

17 Includes faculty in the following departments: basic science, clinical, and other departments.
18 A slight decline in 2004-2005 is likely due to changes in the method of data collection.
19 Full-time faculty members include professor, associate professor, assistant professor, and instructor and other. Part-time faculty members include paid and volunteer members. Data for part-time faculty are not available.

Since 2002, there has been an increase in faculty in nursing education programs:

- In 2002, the reported number of nursing faculty was 3,350, increasing by 25 per cent to 4,205 in 2005 (Canadian Nurses Association & Canadian Association of Schools of Nursing, 2007). In 2008, the number of faculty was reported as 9,771. This includes 2,427 permanent full-time faculty, 1,032 full-time contract faculty and 6,312 part-time contract faculty (Canadian Nurses Association and Canadian Association of Schools of Nursing, 2009).
- Nursing faculty are aging: in 2005, 43 per cent were 50 years of age or older,[20] increasing to 51 per cent in 2008.
- Nursing schools recruited more than 400 full-time and part-time faculty positions in 2005. In 2008, projected hiring requirements for 2009 were for over 350 full-time positions (Canadian Nurses Association and Canadian Association of Schools of Nursing, 2009).
- Nevertheless, the Canadian Association of Schools of Nursing (CASN) projects an annual need for 3,673 nurses with master's level degrees and 650 nurses with doctoral degrees. This takes into account projections of faculty retirements, in conjunction with current staffing challenges and the staffing requirements of other sectors (Canadian Nurses Association & Canadian Association of Schools of Nursing, 2007).
- In 2006, 603 RNs graduated from a master's degree program while 44 graduated from a PhD program — this was far fewer than the projected requirements. Comparable figures for 2008 were 723 RNs graduating with an MSc and 39 with a PhD (Canadian Nurses Association and Canadian Association of Schools of Nursing, 2009).
- The supply of faculty in nursing programs across Canada is a critical factor affecting the country's ability to increase its educational capacity for RNs.

For programs like radiation therapy that are moving to a baccalaureate degree, recruiting faculty with the appropriate educational level is a challenge, given the supply scarcity. Several radiation therapists also raised this issue. They discussed the opportunity to put in place a master's level program for radiation therapy. The challenge will be to find faculty since there is currently no Canadian master's degree program in radiation therapy.

The majority of educators agreed that the main challenges in recruiting new faculty are remuneration and the availability of supply, particularly in those disciplines where educational requirements take a number of

20 This represents 1,459 of the 3,393 faculty who provided age cohort data.

years to complete. In response, one pathologist consulted for the CWSS is looking outside Canada to recruit experienced pathologists. In smaller institutions, location and size add to the challenges. There is more compensation in clinical practices than in academia. Time and workload demands for existing faculty who are also involved with clinical work (particularly physicians in sub-specialties) will continue to compete between teaching and treatment responsibilities. Observations and reports indicate that, if they are forced to make a trade-off, clinicians are more likely to attend to clinical rather than teaching duties (Canadian Labour and Business Centre & Canadian Policy Research Networks, 2005).

Faculty everywhere are challenged to meet their teaching requirements. This results in reduced capacity for research, program evaluation or synthesizing knowledge for publication. In turn, this limits the ability of researchers, program planners and policy-makers to learn from others. CWSS respondents involved in academia commonly noted this lack of capacity. The *Task Force Two Occupational Human resources Data Assessment and Trends Analysis* (*Task Force Two*) discusses this challenge. It does so in the context of the difficulty that clinicians have in maintaining and preserving the equally important responsibilities of clinical work, teaching and researching (Canadian Labour and Business Centre & Canadian Policy Research Networks, 2005).

The rapidly evolving technology in radiation therapy affects the knowledge and skill requirements of both the therapists working in centres, and the faculty responsible for keeping up with the new techniques and teaching those to new therapists and students. This raises two challenges for faculty:

- Common across all health disciplines is the need for continuing professional development. Faculty can keep up with changes through research activities and continuous education and training. Both require time and funding.
- "What is training for?" A radiation therapist posed this question during the study. Are professors to train their students to achieve entry-to-practice credentials — or to have the knowledge of new techniques necessary to perform effectively and optimally in the clinical practice? The dilemma is that entry-to-practice credentials are not keeping up with evolving changes in technology and processes. One CWSS respondent raised the question of what the expectations of employers are with respect to new graduates in light of changing technologies. Existing and new health care providers continue to require new skills and knowledge — and more rapidly than in the past. As one CWSS respondent involved in academia said,

education needs to take action much more quickly to respond to the changes in the health care environment to become very much just-in-time education.

4.4.3 Lack of time for continuing professional development and research

Educators consulted for the CWSS repeatedly identified the following challenges for faculty due to the lack of available time:

- Engage in professional development/continuous learning.
- Review and revise curriculum and/or develop new courses.
- Teach courses in other health disciplines.
- Research and engage in some clinical practice (e.g., visiting centres) to maintain knowledge of the latest technology and issues.

Clinicians who are often asked to deliver a lecture on a topic of their specialty also feel the challenge of time availability. For example, one radiation therapy school that participated in the scoping study would like to have more medical oncologists teaching the oncology portion of the program. However, it is difficult to get a commitment from the oncologists who already have competing demands on their time.

The majority of CWSS respondents did take some continuing professional development learning by attending courses, seminars or conferences. Some were enrolled in programs directly related to their discipline and in some cases, graduate studies. Most received reimbursement for the training taken. In some cases, continuing professional development is included in the contract of employment. Paying for continuing professional development is an issue for many health care providers. There is continued debate about the question of who pays for the continuing professional development and medical education that is mandatory for physicians. The FFS remuneration structure applicable in most provinces does not allow for physicians to charge expenses back to their clients as may occur in other professions (Malatest Program Evaluation and Market Research, 2006). Two RNs consulted for the CWSS who were undertaking a master's degree program were paying for the program, even though it was related to their occupation and would provide them with higher learning and knowledge to bring back to the workplace. One of these nurses only asked the hospital to provide protected time to work on the course requirements.

All respondents in the scoping study raised the issue of protected time for professional development. One of the difficulties they identified is co-ordinating schedules for staff to attend on-the-job training, given the high demand for patient care. The issue confronting many managers

is balancing the need for continuous learning with the need to meet wait time guarantees. In one example, it will be a challenge for managers to find time to train staff on the new computer system for managing electronic health records — even though they know the staff need this training.

There is a need to offer better development and mentoring of health care providers who will be moving into more senior-level positions that involve more managerial responsibilities. Most of the managers consulted in the scoping study did not have any formal training to acquire the skills and knowledge to assist them in their new senior-level positions. For many, the problem stemmed from lack of time to train. Any succession plans that involve recruiting individuals for senior-level managerial positions should include their participation in management development programs and courses.

4.4.4 Challenges to integrating IPE into programs

All the educators consulted in the scoping study were aware of IPE initiatives. However, there is sporadic IPE implementation across the country. IPE has not been a top priority for most universities and provincial education ministries within Canada's educational system (Oandasan et al., 2004). The 2004 *Research and Findings report on* Interdisciplinary Education for Collaborative Patient-Centred Care concludes that most health and education accreditation bodies are exploring the integration of IPE and collaborative practice in academic teaching, but it is not a high priority (Oandasan et al., 2004). Some academic and research institutions[21] are exploring IECPCP models to include as part of their health sciences program curricula. While there is support for IECPCP at higher education institutions, integration is slow due to barriers at the institutional and the practice setting levels.

Barriers to the integration of IPE into training programs include:

- *Scheduling conflicts (cited by the majority of respondents)* — all programs are already at maximum capacity in terms of course time and clinical experience.
- *Trying to fit in additional IPE courses — m*any educators posed the question, "What is nice to have and what is really essential?" In addition, faculties may not be open to new concepts of teaching for IPE as they may be fairly fixed in their current curriculum. There may also be an unwillingness to provide the human or other resources

21 For example, the Colleges of Health Disciplines at the University of British Columbia, the Health Sciences Council at the University of Alberta and the Centre for Collaborative Health Professional Education from the Memorial University of Newfoundland.

(already operating at full capacity) or the funding to develop the teaching programs for IPE.

- *Finding space in diverse curricula* — this requires creative rethinking of structural obstacles that are inherent in research universities and colleges (Gilbert, 2005). Many educators that the CWSS consulted referred to the diversity of curricula as presenting scheduling barriers to integrate IPE courses. Timetabling differences and conflicts across the health disciplines create a challenge in scheduling IPE courses. Linked with this is the lack of students' freedom to select courses. This further reduces IPE course access (Gilbert, 2005). As an educator pointed out, IPE will require joint planning of programs across occupation-specific training groups to ensure common elective time to complete IPE curricula. It will also require reviewing existing courses and eliminating duplicate material.

Educators participating in the CWSS said attitudes are another barrier to integrating IPE. "Getting buy-in from faculty and hence faculty to teach the courses" was identified as an issue for one CWSS respondent (a program head integrating IPE curricula into the current program). "Convincing both faculty and students of IPE's value is a major barrier to overcome" (Gilbert, 2005). Another CWSS respondent said that many faculty members question whether IPE improves collaboration among the professions and actually leads to higher quality patient-centred care.

The environmental scan conducted as part of the IECPCP concludes that there is no reliable evidence on the effectiveness of some of the more popular interventions[22] to improve collaboration. There is more reliable evidence of positive impact on health care processes and outcomes in post-licensure collaborative than pre-licensure IPE interventions (Oandasan et al., 2004).

Training faculty not only to understand IPE but also to deliver courses is another challenge to implementing IPE. Educators interviewed in the CWSS consistently identified that time constraints and full workloads of current faculty and attitudes towards IPE make it difficult to train current faculty to deliver IPE courses. The literature identifies two other barriers: faculty availability to provide new education and teaching on interdisciplinary care, and faculty workload (Oandasan et al., 2004).

22 Interventions are defined as a new way of doing something in comparison to an existing or alternative way. The intervention is usually a new training course in pre-licensure IPE or a new way of encouraging team members to work together in post-licensure collaboration.

Some CWSS respondents consider physical space and infrastructure to be barriers to integrating IPE in their programs. Promoting inter-professional collaboration is a challenge if students are not able to interact physically in an informal setting. McMaster University's Faculty of Health Sciences is the only university in Canada that combines schools of medicine, nursing, rehabilitation sciences and the programs of midwifery, bachelor of health sciences and postgraduate health sciences education in one faculty (McMaster University, 2008). This faculty specifically trains members of the medical team using a collaborative, interdisciplinary approach.

The *Romanow Report* is one of several reports documenting the lack of collaboration among health care professionals in the practice setting. This was a reality that two educators consulted for the scoping study identified. They pointed out that changes need to happen in the practical setting. Health professionals need competencies specific to inter-professional collaboration. These competencies include medication, conflict resolution, negotiation and the need to understand the benefits of collaboration and effective teamwork.

In reality, many professional organizations talk about the need to work together but are reluctant to give up parts of their "scope of practice" without incentives (Oandasan et al., 2004). This organizational barrier is linked to the legislative, regulatory and economic ones that the 2004 *Research and Findings Report* identified. It is a challenge to teach and practice collaboration without a clear understanding of the health professionals' roles (Oandasan et al., 2004). This, in turn, presents obstacles to a health care provider's better understanding of the evolving work and requirements in other health care professions that affect a provider's own responsibilities. For example, some pathologists interviewed in the scoping study stressed the need for team members to understand "pathology language and needs," such as the need to handle tissue samples according to strict protocols, including removing the right size of tissue for analysis.

Two factors are barriers to advancing opportunities for collaborative practice and, consequently, IPE:

- the inconsistent legislative and regulatory framework across Canada concerning the required competencies of healthcare providers
- the lack of a national regulatory framework to define and operationalize optimal competencies among health care professionals.

4.4.5 Funding challenges

Increasing faculty, more clinical placements, expansion of school infrastructure, fellowships and research grants, and incorporating new and leading edge learning technologies all come with costs to the involved parties. These parties include schools, agencies, clinical practices and governments. One pathologist commented that it is difficult to find funds for fellowships in pathology due to its invisibility. Consequently, there is little opportunity to fund fellowships through pharmaceutical/drug companies or from patient donations. With more demands, the need for more funding will continue to challenge the education system.

Canada's medical physics community's desire to accredit its residency programs and, ultimately, establish certification designation of its medical physicists raises a number of issues and challenges. Most notable is the issue of obtaining accreditation of the residency program, particularly for programs in the smaller centres. Meeting the required standards has financial and human resources implications.

Chapter 5 Employment Strategies For The Cancer Control Workforce

There is little information documenting the employment practices and strategies for the cancer control occupations that the CWSS studied. This chapter:

- examines the primary and secondary information that relates to cancer control recruitment and retention strategies
- examines trends in employing Internationally Educated Health Professionals and professionals' remuneration
- explores the challenges that the cancer control workforce faces concerning the supply of human resources, retention and remuneration
- briefly summarizes the results and opportunities for action and further study.

5.1 Chapter Highlights

5.1.1 Recruitment strategies are needed to fill the gaps

- Given the shortage of human resources in most occupations, most managers are currently recruiting staff. Managers are keen to find the right people, noting that for some occupations such as nurses, there may be a need for additional training in oncology on hiring.
- Recruitment is particularly difficult in oncology because of its association with high levels of stress, toxic agents, complex research protocols — and the fact that many patients die.
- Traditional recruitment methods include word-of-mouth and advertisements/job postings in newspapers, on hospital websites and with professional organizations.
- Quality of work-life and balancing work and family/personal life are clearly more important for the new generation of workers in making career decisions.

5.1.2 Recruiting Internationally Educated Health Professionals is challenging

- Canada has traditionally turned to Internationally Educated Health Professionals (IEHPs) to meet gaps in the supply of internally trained health workers. However, now there is questioning about the ethics of recruiting IEHPs from developing countries.
- The use of IEHPs adds to the workload and time demands of managers due to the amount of paperwork, effort and time it takes from the first encounter with the IEHP to the individual's full integration into the workforce in Canada.
- In recruiting IEHPs, there is a risk that the recruited professional may only stay a short time in that location or in Canada before moving elsewhere. Typically, an IEHP will stay at a centre for the time it takes to gain the experience to write and pass his or her discipline's examinations.

5.1.3 Regional and international mobility influences retention

- Health care providers are a mobile workforce — migrating internationally, across provinces/territories, within provinces/territories and from urban to rural areas.
- The competition for health care workers is both inter- and intra-provincial. This is particularly true for smaller and medium-sized centres and regions that are unable to offer comparable salary levels and other advantages, such as the ability to focus on a sub-specialty or research.

- Wage disparity among Canadian regions is creating recruitment and retention challenges.
- Major cities offer a number of attractions including culturally rich and urban lifestyle opportunities. Smaller and remote centres stress the opportunities for leisure time and outdoor pursuits, combined with short commutes.
- Many smaller centres in Canada are educating and training "their own" health care providers with the hope that some of these providers will remain in the region after they graduate.
- Overall, the mobility of RNs reflects the east to west pattern of migration of the general Canadian population. Similar information for the other CWSS occupations studied was not found.
- Although, the out-migration of Canadian medical graduates has been declining since 2002, a major destination for international nurse migration is the United States. It is difficult to measure the number of Canadian RNs that migrate abroad.

5.1.4 Incentives must reflect current realities

- National studies for nurses and physicians identify a variety of factors that attract students to nursing and the various medical specialties. Similar factors likely influence other health professionals. These include:
  - the desire to help people
  - good salaries and benefits
  - job opportunities
  - job security
  - career advancement
  - portability of skills
  - lifestyle considerations
  - quality of the workplace.
- For physicians, incentives include innovative remuneration structures such as payment models that include blended components of Fee-for-Service (FFS), sessional/per diem/hourly, on-call remuneration beyond FFS and benefits/pensions. Physician remuneration structures can be a barrier to inter-professional approaches to delivering care.
- Including protected time into contracts is an increasingly important incentive. Health care workers want recognition for time spent on indirect clinical activities (e.g., continuing professional development, acting as preceptors to train new workers, administration, management, research).

- Employers are using different strategies to keep human resources:
  - developing collaborative practices
  - enhancing roles
  - improving the workplace environment
  - increasing salary and benefits
  - providing bursary programs
  - providing continued education and professional development opportunities
  - reducing workload and physical demands
  - retraining initiatives
  - return-to-service agreements.

5.1.5 Opportunities to improve recruitment and retention for the cancer-control workforce

- Cancer control stakeholder groups have key opportunities to move forward, in spite of the lack of information on effective employment strategies.
- Respondents consistently remarked on the need to manage the labour pool at a pan-Canadian level. Taking a pan-Canadian approach would facilitate knowledge exchange and lead to action steps across stakeholder groups.
- Tracking the mobility of the cancer control workforce and identifying when and why workers leave cancer control will provide a better understanding of where workers go when they exit the system. Analysis of retirement patterns will also contribute to human resources planning.
- At the entry level, understanding the factors that students consider when choosing a profession in health care will help stakeholder groups to develop and target appropriate promotional materials to raise the awareness of a career in cancer control and its rewards. Attracting people to careers in cancer control should start in high school and continue throughout educational institutions.
- Learning more about the career interests and needs of the existing workforce is another area that needs further study. According to the CWSS, some workers are interested in advanced practices and others in leadership opportunities.
- Inter-provincial competition for scarce health care providers contributes to the inconsistent availability of human resources. This further threatens the ability of the Canadian population to have equal access to optimal care. This is especially important for key

occupations that are critical for providing quality, accessible cancer care (e.g., radiation oncologists, medical oncologists, radiation therapists, medical physicists, pathologists and others).

- Supporting and encouraging programs to create clinical placements in aboriginal/rural/remote centres will help to keep graduates in these locations and ensure that populations in these regions have access to the care they need.
- Pan-Canadian approaches to improving access to residency positions in critical oncology occupations and assuring applicants of employment at the end of their training will help smooth out supply chains.
- A pan-Canadian approach to remuneration structures, particularly for physicians, will create the necessary flexibility to optimize each provider's competencies and enhance the patient-centred, inter-professional, collaborative approach to care. This includes the need to review the remuneration models for family physicians/general practitioners in community practices, given their increasing involvement in cancer control at all aspects of the continuum.
- Reviewing pay structures and identifying trends in earnings of the various cancer control providers will establish benchmarks that employers and governments can use for comparison with other regions of the country. This information will help planners, especially, in making budget forecasts.
- The work taking place at a national level to enable IEHPs to integrate into the health care workforce more readily and smoothly must continue and be supported. This will add to the labour pool and will reduce the amount of manager effort, time and frustration. Greater consideration is needed to support the ethical recruitment of IEHPs.

5.2 Trends

5.2.1 Recruitment strategies

There is little documentation in the literature on cancer control workforce recruitment strategies, issues and factors. Some indirect comments received from CWSS respondents indicate the use of traditional recruitment methods such as job advertisements within the hospital and local, provincial and national newspapers, word-of-mouth and on hospital and professional association websites. Some recruiters also promote the qualities of the communities they live in, provide souvenir items and promote the commitment and quality of the staff in their workplace. Most of the manager respondents in the CWSS recognized that the new generation of health care providers has

different views about what constitutes an "incentive" than previous generations. Overall, the quality of work life and balancing work and family/personal life are increasingly becoming key decision-making factors for the new generation of workers (CTV.ca News Staff, 2008).

New graduates in most occupations are looking for work-life balance. One CWSS respondent noted the increasing frequency of negotiating work-life balance into the remuneration packages of surgical oncologists. Some workers are looking for part-time hours or flexible work arrangements. Consideration and provision of alternate work arrangements will address the growing demands by health professionals, across healthcare, for better work-life balance. Alternate work arrangements may also help retain potential retirees (e.g., assuming different responsibilities such as full-time teaching or continuing in the same functions but with a workload suitable to their life needs).

As noted above (Section 5.1.3), many of Canada's smaller and under-serviced regions are trying to train "their own" with the intent that those born in the region will be more than likely to remain there. This may be also true for other regions of Canada, as recruiting and retaining health care providers becomes more challenging. A comprehensive approach that supports career opportunities, continuous learning opportunities, practice supports such as locum coverage and support for physicians' spouses/partners are highlighted as critical to successful recruitment initiatives. Providing training opportunities and practicums in remote and rural communities is expected to encourage and increase the supply of health care providers to these under-serviced regions (North South Group Inc., 2004).

A US study explored the opportunity to partner with the schools of nursing as an effective strategy to recruit qualified oncology nurses (P. R. Ponte et al., 2005). The study concluded that collaboration among nursing leaders in hospitals and schools of nursing to develop programs for faculty and students can be an effective recruitment strategy (P. R. Ponte et al., 2005). Traditional recruitment strategies, such as a competitive salary structure and opportunities for continued professional development, were not enough to ensure an adequate supply of oncology nurses.

According to a major Ontario study, effective strategies to recruit oncology nurses are essential to ensure an appropriate supply of nurses to meet patient needs (The Systemic Therapy Task Force, 2000). A key strategic thrust is to attract oncology nurses by fostering better career development through on the job professional development, promoting advanced practice roles and providing the opportunity to work as a primary care nurse in partnership with physicians. The report also cites

the need to introduce medical students and residents, nurses and pharmacists early in their studies to oncology practice, and to provide competitive compensation packages.

Task Force Two: A Physician Human resources Strategy for Canada's Occupational Human resources Data Assessment and Trends Analysis (*Task Force Two*) looked at recruitment factors and strategies for physicians in general (Canadian Labour and Business Centre & Canadian Policy Research Networks, 2005). Life style issues are at the forefront as younger recruits enter practice. Increasingly, physicians are attracted to different remuneration models than in the past. They are more interested in models that take into account the activities where they are not receiving adequate compensation. Solo practices are becoming less appealing to physicians. An inter-professional approach to practices is becoming important to physicians as they experience greater levels of stress and burnout.

Most of these factors apply to the cancer control workforce. Respondents to the CWSS are interested in a better work-life balance. This includes protected time for non-clinical related responsibilities such as research and continuing professional development. Respondents were also aware of the impact that the new attitudes have on the demand for cancer control workers noting: "life-style changes mean that 1.5 to 2 workers will be needed to replace each retiree" and "younger professionals want work-life balance."

Given the number of cancer control providers who identified having protected time as an incentive, some workplaces are now offering this as part of recruitment strategies. Building protected time into new and existing contracts is one way to ensure health providers work to their full scope of practice and have some respite from the demands of direct patient care. This will lead to a more satisfied workforce. That, in turn, will affect the quality of patient care.

Many are also seeking workplaces that offer opportunities for professional advancement. This includes moving into positions that are more senior or assuming more advanced practice roles. With global shortages, pressure from recruiters to entice Canadian health care professionals to emigrate will continue to intensify. This will add to the competition that already exists within the country for providers.

5.2.2 Internationally Educated Health Professionals (IEHPs)

There has been great interest in the last few years to look at IEHPs as an immediate solution to the shortages that a number of occupations face. Canada has always relied on IEHPs. Now, they form an important

portion of the country's healthcare system. About 23 per cent of Canada's physicians are foreign-trained. This has been the case for a few decades (T. McIntosh, Torgerson, & Klassen, 2007).

Much of the recruitment of International Medical Graduates (IMGs) is through word of mouth (Canadian Labour and Business Centre & Canadian Policy Research Networks, 2005). IMGs who enter Canada and successfully obtain their license often refer their former colleagues to Canada and to specific provinces. The number of Internationally Educated Nurses (IENs) increased from 1,376 in 1999 to 4,044 in 2003, with a slight decrease between 2002 and 2003 of 927 RNs (Jeans, Hadley, Green, & Da Prat, 2005). Despite the possible inaccuracy of the numbers, the trend indicates an increasing number of IEN applicants. About 40 per cent of the IENs registered are over 40 years of age. About one-third of IEN applicants integrate into the nursing workforce in Canada. Although not all IENs applicants will be successful, more IENs *can* be successful with the appropriate support and education, and a modernized approach to assessment.

A number of IEHP initiatives have been launched in Canada. These include physicians, nurses, medical radiation technologists, midwives, occupational therapists, medical laboratory scientists, physiotherapists and pharmacists. Some of these completed an environmental scan. The scans identified the process from the first interest to work in Canada, to full integration into the workforce. The respondents also identified barriers and enablers to practicing in the workplace. Many are common in all the scans. They include challenges with credential recognition, long processes to obtain licenses, language issues and a lack of co-ordinated approaches to registration across the country. It takes a lot of time and energy to get the necessary requirements and obtain licensure, according to two CWSS respondent managers who have recruited outside Canada.

Over the last five years, there have been questions about the ethics of recruiting IEHPs offshore. In particular, recruiting IEHPs from countries such as Africa and Asia depletes the pool of much-needed health care professionals in these and other developing countries. Various organizations have issued position statements on this issue. However, it remains to be seen what other regulations and ethical guidelines will be implemented nationally and internationally. A report prepared for Health Canada examined the preferred practices for deployment of health human resources. It recommends taking care in recruiting internationally because of the imbalances it creates in geographic areas with acute health human resources shortages and the inability to compete with more affluent economies (North South Group Inc., 2004).

It is not known how many IEHPs are in the cancer control workforce or what efforts managers are making to recruit abroad. Some CWSS respondents reported recruiting from other countries to meet their critical needs. Because no medical physicists were available in Canada, one province recently recruited them from the United Kingdom. International recruiting has special challenges. One province worked for nine months to hire much-needed oncologists. It is not even close to finishing the process due to the need to co-ordinate licensing at both the national and provincial level and meet the university's requirements for academic appointments.

5.2.3 Retention strategies

Health care providers are a mobile workforce. They migrate internationally, across provinces/territories, within provinces/territories and from urban to rural areas (CIHI, 2007a). In light of the critical shortages, jurisdictions are implementing retention strategies to keep much-needed health care providers in their region using the kinds of incentives described in section 5.1.3 of this report.

Several years ago, Newfoundland and Labrador found it necessary to pay bonuses to retain medical physicists due to a critical shortage of physicists.

The CWSS did not find any information in the literature on the extent to which retention strategies are used in cancer control. A longitudinal study over a two-year period examined the factors that influence recruitment and retention of oncology nurses in Canada (Bakker & Fitch, undated). Results from the final report, once available, will benefit the management of human resources and health services policy for oncology nursing. CWSS respondents confirm that work overload, lack of time for non-clinical responsibilities, stress and inability to work at optimal competencies are factors currently being felt among the cancer control workforce. They affect the ability to retain existing employees and attract health care professionals.

Providing low-risk management development opportunities can be considered part of the learning experience for future managers. Managers are dealing with:

- continued time pressures on staff
- more and more emphasis on collaborative patient-centred practice
- multi-generational workplaces that include traditionalists, boomers, and generation X and Y
- technological changes
- other operational and budgetary issues.

Leadership training is also essential for health care providers who may take on leadership roles. Management development is important to maintain continuity in the workplace. This, in turn, improves staff morale.

5.2.4 Career paths

For some occupations that the CWSS reviewed, there is a clear interest and need from the knowledge and skills perspective to apply advanced practices for professions such as radiation therapy and nursing. This provides new career opportunities to providers working in those occupations.

The CWSS did not find any information that assessed the factors that attract students and new recruits to work in oncology and in various practice settings. Studies have looked at students' perspectives and factors that influence career choices for nursing and physician occupations in general. The national nursing study completed in 2005 in Canada investigated the students' perspectives on the reasons for selecting nursing as a career (Nursing Sector Study Corporation, 2005). It concluded that nursing students are primarily motivated to enter nursing for altruistic reasons such as a desire to help people. Monetary incentives in the form of good salaries and benefits were influential. In addition, it identified practical considerations such as job opportunities, job security, career advancement and portability as important factors in encouraging students to choose nursing as a career.

The *Task Force Two* national physician human resources study found that family medicine and the generalist specialty disciplines are continuing to decline in popularity as a first-choice professional discipline. The trend in Canadian medical school graduates' choice of discipline appears to be increasingly moving towards sub-specialties (Canadian Labour and Business Centre & Canadian Policy Research Networks, 2005). Since the report, the popularity of family medicine as the first-choice professional discipline seems to be levelling out (Personal Communication, 2008). The study points out that, although there is a need for a better understanding of the factors that affect students' decisions, lifestyle considerations and workplace quality — including avoiding stress and burnout — have a significant impact on the choice of specialization and future practice setting.

5.2.5 Remuneration

Remuneration is integral to any recruitment strategy. Remuneration structures differ among the various disciplines employed in cancer control and by province. There is very little available information on the

factors that drive different compensation structures for the various cancer control occupations. The *Task Force Two* report summarizes the remuneration structures for physicians, describing different compensation methods (Canadian Labour and Business Centre & Canadian Policy Research Networks, 2005).

CIHI publishes information on reciprocal billing for physicians in Canada and average payment per physician utilizing FFS information (CIHI, 2007c). Special data runs may be possible for the oncology specialties but the CWSS did not conduct them. The 2007 NPS reports FFS as the principal method of remuneration (90+ per cent of income) for 48 per cent of family physicians. A further 31 per cent reported a blended model (CFPC et al., 2008). There is wide variance in the principal remuneration models for oncology specialists:

- 35 per cent of medical oncologists and 32 per cent of general pathologists reported that 90+ per cent of their income was salary based
- 52 per cent of radiation oncologists reported a blended model
- 56 per cent of general surgeons reported 90+ per cent of income was FFS.

The three main approaches to paying physicians for their services are FFS, capitation and salary. FFS is the mode of remuneration for most Canadian physicians but this has slowly been declining in the last decade. (Canadian Labour and Business Centre & Canadian Policy Research Networks, 2005). *Task Force Two* found that this funding model was not conducive to integrated care because it does not compensate for consultation amongst professionals. This finding is supported by CWSS respondents who noted that current remuneration structures for physicians would need to be altered to allow for a more collaborative approach to patient-centred care that includes other health care professions carrying out patient consultations.

When asked for their preferred method of remuneration, 52 per cent of family physicians and general surgeons, 61 per cent of radiation oncologists and 39 per cent of medical oncologists prefer a blended model[23] (CFPC et al., 2008). Family physicians would like a blended payment method that included FFS, on-call remuneration beyond FFS and sessional/per diem/hourly blended components. General surgeons also identified blended components of FFS and on-call remuneration beyond FFS but their third preferred component was benefits/pensions. Although the NPS asked all physician respondents this question, data

23 No data was provided for general pathology due to few respondents.

were not presented for medical oncologists, pathologists and radiation oncologists due to the small numbers responding to this question.

Alternative compensation structures for physicians are increasingly being explored and considered across the country as remuneration models need to reflect the complexity of the care, the time involved, and the inter-professional team approach to care. For example, nurse practitioners are more commonly being included in primary care teams and have more authority to prescribe and perform patient consultations. No FFS code exists to reimburse an inter-professional group practice for these services.

Primary health care reform, which involves multidisciplinary teams and alternate funding models, is also contributing to the review of compensation structures. The current direction is to include pay for performance. Incentives for family physicians to conduct cancer screening are important for Pap tests for cervical cancer and Fecal Occult Blood Test (FOBT) for colorectal cancer. FFS codes are also being introduced for follow-up care for cancer patients.

5.3 Challenges

One key underlying challenge is the lack of data and information on recruitment strategies including career pathing, decision-making and remuneration factors for the professions. This knowledge is important to assist human resources planning. Managers and health care providers consulted for the CWSS identified a number of challenges.

5.3.1 Dwindling supply of cancer control health professionals

As earlier chapters of this report discuss, there is a shortage of human resources in most cancer control workforce occupations. The 2006 *Supply and Demand Study for Medical Radiation Technologists* shows a 3 per cent vacancy rate across Canada for radiation therapists (CAMRT, 2006). Some provinces have a zero per cent vacancy rate. Other provinces are slightly higher than the Canadian average, including New Brunswick and Québec at 6 per cent.

Most managers are actively recruiting to fill vacancies but the specific occupations in demand varied among the programs that the CWSS included. Most CWSS respondents referred to the "fight to acquire qualified and experienced health providers" in a market where there are too few health care providers. They condemned the escalating salary competition for human resources. Managers are keen to find the

right people, noting that additional training in oncology may be needed for providers in some occupations (e.g., nurses), once they are hired.

Recruitment is a challenge for many specialty areas. It is particularly difficult in oncology because of its association with high levels of stress, toxic agents, complex research protocols and the fact that many patients die (P. R. Ponte et al., 2005).

Faced with a critical shortage of medical physicists, Newfoundland and Labrador was having difficulties in recruiting physicists since compensation was not at parity with the other Atlantic Canada provinces and the rest of Canada overall. As a result, it adjusted wages to be more competitive with Atlantic Canada. The province recruited medical physicists from outside Canada to meet its immediate needs. Today, Newfoundland and Labrador is promoting the training of medical physicists within the province with the hope they will stay in the province on completion of their studies.

Manitoba faced similar situations in the late 1990s when a shortage of radiation therapists emerged. The shortage developed when Ontario implemented a four-year degree program, resulting in an interruption of the supply of radiation therapists for several years. As Ontario produced close to half of all radiation therapists, a ripple effect occurred throughout the country. Some provinces immediately raised salaries, leaving others with many vacancies. Manitoba responded by hiring radiation therapists from South Africa.

The competition for health care workers is both inter- and intra-provincial. For example, six of the 10 fully trained medical physicists who graduated from an Ontario program remain in Ontario (personal communication). The other four graduates are either “lost” to another province and/or to the United States. The inter- and intra-provincial competition for human resources is particularly magnified for smaller and medium-sized centres and regions that are not able to offer comparable salary levels and other clinical opportunities, such as the ability to focus on a sub-specialty or research.

Other respondents noted the attractions of the affluent, culturally rich, urban life style opportunities available in major Canadian cities. Smaller, more remote centres counter by stressing the opportunities for leisure time and outdoor pursuits, combined with short commuting times. In some situations reported to the CWSS, staff members were lost to nearby competing centres that were able to offer more incentives. Lack of colleagues can also be a negative factor. Practitioners welcome the opportunity to work in practices where colleagues are available to provide a second opinion, especially as

illnesses become more and more complex. This is the case for pathologists where there is a need to increase the number of pathologists, determine reasonable workload standards and develop a national quality assurance program to diminish the potential of misdiagnosis (Ubelacker, 2008).

A recent analysis of physician international migration patterns reported that 80 per cent of practicing physicians who were graduates of Canadian medical schools and who left Canada between 1995 — 2005, went to the United States (Watanabe, Comeau, & Buske, 2008). Of those Canadian graduates who left in 1996 and 1997, 33 per cent and 34 per cent, respectively, had returned by 2005. Approximately 80 per cent of returning Canadian graduates did so within five years of leaving. Furthermore, there has been a decline in out-migration of Canadian medical graduates. These results are supported by a report that found the overall number of physicians leaving Canada to move abroad decreased by 57 per cent between 2002 and 2006 (CIHI, 2007d) — the number of family physicians moving abroad decreased by 45 per cent, while the number of specialists decreased by 62 per cent.

Without a national unique RN identifier, accurate tracking of the migration and movement of RNs within Canada or even within a provincial/territorial jurisdiction is not possible (CIHI, 2007b). While the place of graduation can be used as a proxy indicator, it is not considered an accurate measure. Overall, the mobility of RNs reflects the general Canadian population's migration pattern from east to west. Almost nine of 10 Canadian nursing graduates who were working in Canada in 2006 either did not move after graduation or eventually returned to their home jurisdiction.

It is difficult to estimate the number of Canadian RNs who migrate abroad. A recent study cites Canada as a major source and a destination for international nurse migration, with the United States a major beneficiary of Canadian nurse emigration (Little, 2007). A survey conducted by the Commission on Graduates of Foreign Nursing Schools (CGFNS) found that 23 per cent of the licensed foreign nurse graduates in the US workforce in 2000-2001 were born in Canada. Further, 13 per cent of the respondents who entered the United States under the North American Free Trade Agreement were Canadian. Much of the literature points to the 1990s domestic labour market conditions as the reason for the outflow of nurses from Canada. The Registered Nurses Association of Ontario (RNAO) reported that downsizing and lack of job opportunities were the main reasons identified for nurses leaving Ontario (RNAO, 2001). Canadian nurses are recruited directly by US hospitals, and indirectly through international recruitment firms (NRU, 2003). Advertisements in newspapers, on hospital and other websites, and at

career fairs are the typical methods for recruiting Canadian nurses. Organizations also offer incentives such as signing bonuses, relocation allotments, scholarships for continuing education or paid travel expenses.

Another study attempted to understand why Canadian nurses leave Canada to work abroad. It found that the majority of nurses surveyed who left Canada did so because they were seeking full-time employment (McGillis Hall, 2007). Contrary to popular belief, the study highlights that nurses do not migrate for the salary or educational incentives offered. Overall, there is often a minimal net gain in the total nursing workforce due to the net effect of RNs *immigrating to Canada*, encouraged by new policies, and Canadian RNs *emigrating from Canada* as a result of current working conditions and lack of full-time employment for nurses (Little, 2007).

Recruiting IEHPs raises a number of challenges. The issue of credential recognition of IEHPs is a problem. Managers spend a considerable amount of time and effort to employ IEHPs for Canadian positions. A number of managers interviewed for this study faced these issues. They found that the paperwork, time and effort spent on recruiting the IEHP added to their already over-extended workload. A recent study reports that 47 per cent of IMGs who were licensed between 1995 and 2005 and left Canada during that time, returned to the country where they received their medical degrees (Watanabe et al., 2008). Three years was the average duration between licensure in Canada and departure. This suggests that this group of IMGs came to Canada for training, skills development or practice experience to complement their knowledge.

5.3.2 Remuneration

Wage disparity among different Canadian regions and, in particular, for the smaller provinces is creating recruitment and retention challenges. The lack of wage parity with other provinces in Canada is cited as a reason why pathologists leave the smaller cities or more rural areas such as Newfoundland and Labrador (Ubelacker, 2008). Pathologists in Newfoundland and Labrador had the lowest pay rates in Canada. The average turnover rate of pathologists in that province was 32 per cent in the previous four years (2003-2007). Some of the managers consulted in the CWSS also identified compensation issues as a challenge to attract health providers to their centre. They mentioned other non-monetary factors as important determinants. Some nurses pointed out in the consultations for the CWSS that there was only limited remuneration for the additional oncology qualification. This does not provide much incentive for further training and professional development. However,

nurses may feel it necessary and find more job satisfaction to gain more knowledge and experience in cancer care.

5.3.3 Retaining health care providers in cancer control

A number of participants who worked in small and medium-sized centres raised the issue of the retention of health care providers in cancer control. In some cases, health care providers continue to work at a centre to get the necessary amount of clinical experience to write and pass their certification exams. Once they have achieved this, they tend to leave. The manager of one centre said that the turnover of medical physicists there has meant a lack of continuity of a consistent knowledge base. “If they are from this region, then they will stay,” said several managers in smaller regions of the country.

High physician turnover in rural and under-serviced regions is a problem in Canada (Audas, Ross, & Vardy, 2004). This is particularly true with IMGs. In some provinces, the turnover of IMGs is very high due to migration to other regions of Canada. The Newfoundland and Labrador Medical Association found that three-quarters of the IMGs coming to the province stay for two years, obtain Canadian credentials and then move to other provinces, particularly to large urban centres.

Managing the increasingly large workloads is creating stress among the cancer control workforce. This affects retention. CWSS respondents regularly cited trying to prioritize the management of wait lists as one of their greatest pressures. With the increasing incidence of cancer, there will be a need for better management of patient scheduling to avoid worker burnout. The implications of the Grunfeld study discussed in Chapter 3 of this report highlight the negative consequences resulting from burnout, both for the individual and organization. For the individual, there are often mental and physical health problems due to burnout. This translates into absenteeism, high turnover rates and reduced organizational productivity (E. Grunfeld et al., 2000).

Chapter 6 Approaches to Service Delivery

6.1 Chapter Highlights

Cancer control programs are implemented to improve patient outcomes, and, in particular, to prevent the development of cancer, reduce mortality from the disease and improve survivor quality of life. Ideally, such programs are implemented within a health system that uses a

population-health approach to balance investments among prevention, screening, treatment, supportive care and palliative care.

6.1.1 Evidence-based clinical practice guidelines (CPGs) may be the first step to plan cancer control programs

- CPGs are important not just to plan the treatment — they are essential to communicate the appropriate treatment protocol to all team members. As Wortsman and Janowitz identified (unpublished report, 2008), there is a need to build on CPGs to develop program implementation models, human resources standards and guidelines that ensure the appropriate and safe delivery of care.
- There is some national work to develop CPGs (e.g., breast cancer guidelines through the Canadian Breast Cancer Initiative). The Clinical Practice Guidelines Action Group of the CPAC provides national co-ordination of current work.
- While evidence-based CPGs establish the best treatment for the tumour, further work is needed to determine how best to deliver the treatment program to a given population. Thus, CPGs are the starting point to guide development of service delivery models aimed at providing cancer control programs.

6.1.2 Models for delivery of cancer control programs

- Approaches to service delivery in cancer care are in transition. While the consensus on models of care is that "one size does not fit all," managers participating in the CWSS are working creatively within resource constraints to adapt existing models or develop new ones to deliver effective services to their patient populations.
- Cancer control programs have typically been implemented in one of two ways in Canada:
  - Inter-professional teams provide a range of integrated services using principles of population health and patient-centred care. This approach has evolved over the past two decades, primarily for organized breast cancer screening programs and hospice palliative care. Currently, many regions of Canada are transforming primary health care using this model. It is also being applied to programs in other parts of the cancer control continuum, particularly prevention and systemic therapy.
  - The traditional model of individual patient-physician interactions may have some features of teamwork (e.g., most radiation oncology) but is not necessarily integrated well enough with other aspects of patient care to be considered a full inter-professional team approach from a patient perspective.

- The following service delivery models identified in the CWSS are some (but not necessarily all) of the possible approaches being taken.

6.1.2.1 Patient-centred population health-based primary health care

- The gradual implementation of this model has important implications for the co-ordination of care for cancer patients across the cancer control continuum.
- This model is particularly important for prevention, screening, rehabilitation, supportive and follow-up care and for home-based palliative care.
- Cancer control programs must be integrated effectively into primary care. There must also be documentation of the challenges family physicians face in delivering cancer control programs (e.g., remuneration and training).

6.1.2.2 Organized programs to deliver cancer screening

- Organized approaches are considered the most efficient and cost-effective way to ensure quality screening and optimal patient outcomes.
- Shortages in key occupational groups hamper effective delivery of screening programs. Recruitment for cervical and colorectal cancer screening relies on the availability of already strained family physicians. Nurses who could contribute by taking cervical smears or, with appropriate training, providing sigmoidoscopies are also in short supply.
- Screening programs require support from good information systems to prioritize who is screened. Currently, many programs are screening people who want to be screened, not necessarily those who would most benefit from screening.
- The implementation of good information systems requires health records technicians, epidemiologists, statisticians and systems analysts who are knowledgeable about cancer. All these occupational groups are experiencing shortages.

6.1.2.3 Establishment of diagnostic centres

- Diagnostic centres staffed by inter-professional teams would reduce wait times for patients by providing “one-stop shopping” for all diagnostic tests.

- Good case studies and evaluations are needed to demonstrate effectiveness and to provide working models that show how these centres may be effectively integrated into the cancer control system in both large and small communities.
- Telehealth provides opportunities for mentoring and linking smaller and larger centres for quality assurance purposes.

6.1.2.4 Use of networks by cancer agencies to co-ordinate care in the community

- Networks offer considerable promise to co-ordinate training and promulgate clinical practice guidelines to practitioners.
- The effectiveness and operation of these networks should be explored further.
- Telehealth approaches to training and dealing with difficult problems support network development.

6.1.2.5 Delivery of systemic therapy in communities closer to the patient's home

- The increasing development of community networks shows great promise for delivering care closer to the home. Both patients and care providers enthusiastically support it.
- Issues raised with respect to this model include:
  - Shortages of family physicians, nurses and pharmacists, although pharmacy technicians are being used to support the pharmacy component of the community network model.
  - There is a need for a small number of highly trained staff to deliver the program and to cover absences, taking into account that some staff must be shared with other departments in the hospital.
  - Models are needed to integrate systemic therapy units with broader primary health care initiatives in the community, so that the patient's regular family physician remains involved in patient care.
  - Funding formulas do not consider prevalent cases or the ever-increasing complexity and toxicity of treatments. Remuneration models do not always provide financial support for physicians or nurses to take the necessary oncology training.
  - Further work, including comparative case studies, is needed to identify all of the implementation issues and to optimize the use of this approach to service delivery.

6.1.2.5 New roles for radiation team resources

- The development of new roles within the radiation team is helping to optimize the use of resources. These new roles include physics assistants and advance practice radiation therapists.
- Teams in this area are stretched to keep up with new technologies and assure effective quality control.
- Time is needed to communicate effectively with other teams to plan optimal treatments for patients.
- Management and leadership models for the radiation therapy team can be quite complex. Understanding how various provinces organize the relatively small number of critical resources in this area could help everyone.
- The absence of a supply and demand model for Canada that provides national co-ordination for all occupations involved in the team impedes radiation planning.

6.1.2.6 Inter-professional palliative care programs

- Effective inter-professional palliative care programs are in place in many areas of Canada, supported by the Norms of Practice that the Canadian Hospice Palliative Care Association publishes.
- Shortages of palliative care physicians (difficult to document due to the lack of available information) and inadequate funding levels, clearly impede wider implementation of these programs.
- Better integration of palliative care programs with the oncology program will offer patients and their families a seamless transition to end-of-life care.

6.1.3 Challenges and opportunities for improved delivery of cancer control programs

- Incremental steps are being taken in most areas of the cancer control continuum to optimize service delivery.
- Considerable efforts are underway to develop cancer programs for rural, remote and aboriginal populations.
- In general, individual cancer agencies, provincial departments of health, tertiary care hospitals or local community networks assume the responsibility for program design and implementation. They work out the details for their local populations, within the constraints inherent in Canada’s health care system.

- Various approaches to service delivery are exploring the use of new roles to alleviate shortages and contribute to optimizing competencies and improving team function.
- Some programs use a process mapping approach to develop efficient and effective ways to deliver programs that make the best use of available resources with the opportunity to build in quality assurance.
- There are systemic barriers. These relate to shortages, inadequate funding, lack of information for planning, the need for human resources standards and — and for cancer control workforce human resources to be a priority of both the health and the education systems.
- Clearly, more work in identifying models for service delivery in cancer control and assessing the strengths and challenges of these models is needed. The CPAC Human Resources Action Group (CPAC–HRAG) is currently supporting a project to start this process.

6.2 Current Approaches to Service Delivery in Canada

The following sections summarize the approaches to service delivery and the main human resources issues along the cancer control continuum according to CWSS respondents, supplemented with selected information from the scientific literature. Information plays a key role in planning, monitoring and evaluating cancer control programs and cancer control workforce planning. Therefore, surveillance is included as a special section.

6.2.1 Surveillance

Needs-based forecasting models for planning for health human resources require information to predict the need for human resources based on population-based indicators of health and disease prevalence (CIHI, 2007a). Canada is fortunate to have population-based cancer incidence data from a network of cancer registries that have contributed data to Statistics Canada since 1969 (Band et al., 1993). As of 1992, these data have been reported to the Canadian Cancer Registry (CCR). The CCR is patient-oriented and includes national death clearance. The ability to link the data for cancer diagnosis and death means that national survival and prevalence rates can now be calculated and published.

Program managers interviewed in three provincial cancer agencies consistently mentioned the shortage of health records technicians and cancer registrars. These occupations are needed to capture stage and

other detailed medical information from patient charts into their provincial cancer registry database.

> "Nova Scotia abandoned the health technicians training program six or seven years ago, thinking a degree program would replace it. (Now there is no program) … we have no local pool to draw upon and our current population of workers is retiring."

> "Cancer registrars are underpaid and dumped on big time by the organization. Our registry expanded and increased workload by 25 per cent, with no increase in staff."

The full potential of cancer registry data for cancer control workforce planning and evaluation can be reached through linkages with other data sets. Some provinces have developed this capacity, including linking cancer registry data to data on hospital separations, physician billings, pharmacy data and other health data sources. Analyses from these linked data sets can provide a broad understanding of health services utilization and patient outcomes for cancer care, including human resources. However, managers consulted for the CWSS reported challenges in recruiting the necessary epidemiologists and statisticians to design and conduct research studies, analyze data sets and communicate effectively with other research team members and cancer agency staff. One manager stressed the importance of national workshops and other opportunities for training in specialized methods that are necessary for cancer registry research and analysis.

Managers perceived the need to bring various perspectives to bear on relevant research questions to ensure the ready translation of project results into improved care. To be effective, research teams should ideally involve collaboration among academics, in-house epidemiologists and clinicians. One manager consulted in this scoping study noted the difficulties of merging clinical information from the electronic health record with the cancer registry, and called for a cancer information strategy to ensure effective and efficient data flows for planning and research purposes.

> "We have embedded cancer registry analysts in the tumour groups in our agency to enhance use of data for decision-making."

> "We are frustrated by the lack of a cancer information system strategic plan; work is ongoing with clinical data for the electronic health record, but the surveillance and cancer registry data are not engaged."

> "Knowledge transfer works best when cancer agencies are involved."

"A future role of academic health community should be to help synthesize and integrate evidence for clinical service delivery."

The key human resources issues identified from the CWSS primary and secondary research and relating to surveillance include the:

- development and access to linked data sets
- need for a cancer information strategy
- need for a common pan-Canadian approach to training analytic staff
- need for inclusion of opportunities to collaborate across Canada as part of staff development
- shortages of epidemiologists and statisticians
- shortages of health records technicians due to inadequate production from education programs.

6.2.2 Prevention

Prevention programs for cancer are largely community-based. Usually, they are integrated with other chronic diseases. Key areas for prevention include smoking cessation, diet, physical activity, alcohol consumption and sun exposure. These are ways to reduce the incidence of cancer and, thereby, reduce the need for human resources at subsequent steps of the cancer control continuum (Health Canada, 2004). CWSS respondents provided some insights into prevention programs based on key informant interviews and observations from site visits. However, the three selected occupations working in this part of the continuum — registered nurses, nurse practitioners and family physicians — also provide services across the continuum. Respondents tended to focus their remarks on other areas. It would be valuable to do more work in describing the emerging role of nurse practitioners in primary health care teams.

At the national level, the Chronic Disease Prevention Alliance of Canada (CDPAC), formed in 2001, combines cancer prevention efforts with those for other major chronic diseases. More recently, a pan-Canadian Integrated Strategy on Healthy Living and Chronic Disease has been established with leadership from the Public Health Agency of Canada (PHAC, 2005). CPAC supports a Prevention Action Group. Its goals include working with other chronic disease organizations on health promotion, addressing common risk factors, facilitating progress in communities of practice that require infrastructure and capacity building, and working with primary care providers to enhance the role of prevention in the primary care setting (CPAC, 2008b).

Prevention strategies and higher-level program planning may be supported by provincial governments or other provincial level entities, and co-ordinated with major stakeholders. For example, the Canadian Cancer Control Strategy — British Columbia and Yukon Division organizes an active prevention committee to develop joint projects across stakeholders. These include the BC Cancer Agency and the Provincial Health Services Authority. In British Columbia, regional health authorities have some responsibility to improve population health (e.g., smoking cessation to reduce smoking rates).

CWSS respondents identified over 30 occupations that contributed to cancer prevention. Physician groups included family physicians, clinical geneticist, dermatologist, haematologist, paediatrician and paediatric haematologist. Nursing occupations included registered nurses, nurse practitioners, clinical nurse specialists and licensed practical nurses. Other contributing health professionals included diagnostic cytology technologists, medical laboratory technologists, clinical genetics technologists, dentist, dental hygienists, dieticians, pharmacists, optometrists, health educators and health promotion specialists. In addition, the CWSS identified a broad range of informatics and research occupations (Appendix C).

For the average Canadian, prevention programs are community-based, with public or private health practitioners providing some counselling. There are many ways to deliver prevention programs including:

- Counselling by public health nurses, family physicians or dieticians in the public and private sectors on appropriate food programs for weight control
- Media advertisements or reports
- Nutritional labelling on packages
- Programs to encourage increased levels of physical activity
- Regulation of tobacco use through display restrictions and taxes
- Smoke-free areas
- Sun safety campaigns.

Nurse practitioners are increasingly taking on a leading role in such programs. As with tobacco control, there is a need for a multi-pronged approach for prevention programs, including programs aimed at changing individual behaviour, societal level changes (e.g., smoking restrictions) and taxation policy (e.g., taxation on cigarettes).

6.2.2.1 Primary health care

A critical initiative in recent years has been the transition to primary health care, which takes a broad population-based approach to health. Primary care, in this paradigm, concentrates on health care services, health promotion, illness and disease prevention (Health Canada, 2006). Two key functions of primary health care are:

- direct provision of first-contact services by a team of providers
- co-ordination of care to ensure continuity and facilitate navigation across the system (e.g., to specialized services or hospital care).

There may be variances in the range of the provided services in response to community needs, the governance and the funding models, but primary health care services include several functions relevant to cancer control such as health promotion, referrals to/co-ordination with other levels of care (such as hospitals and specialist care), rehabilitation services and palliative and end-of-life care (Health Canada, 2006).

The key feature of primary health care reform is a shift to teams of providers who are accountable for providing comprehensive services to their clients. Family physicians, RNs, nurse practitioners and other professionals (e.g., pharmacists or physiotherapists) working as partners will result in better health, improved access to services, more efficient use of resources and better satisfaction for both patients and providers (Health Canada, 2006). Nurse practitioners can serve as the first point of contact within primary health care teams.

Effective delivery of primary health care services relies on numerous other resources, including:

- an adequate supply of health human resources
- a team approach focused on patient needs, so that each service is provided by the most appropriate provider and providers work collaboratively to optimize outcomes
- information technology (especially electronic health records)
- governance and funding models which support team-based care
- links to public health
- a culture of accountability, performance measurement, and quality improvement
- an explicit focus on change management activities to support all of the above.

Family physicians are gradually moving towards this approach to providing health care. The recent National Physician Survey shows that nearly one-quarter of family physicians are working in an inter-professional practice. Further, 85 per cent of family physicians reported they provide care to cancer patients and offered the following services relevant to cancer control to patients: pain management (62 per cent), palliative care (55 per cent), nutritional counselling (42 per cent), public health services/health promotion (31 per cent) and substance abuse care (26 per cent) (CFPC et al., 2008).

6.2.2.2 Access to primary prevention

The College of Family Physicians of Canada in collaboration with CPAC's Primary Prevention Action Group recently conducted a recent survey of just over 1,000 family physicians. It provides insights into the role of family physicians in cancer prevention. Nearly all family physicians monitor tobacco use and provide counselling to patients on smoking cessation. Most provide counselling on alcohol abuse with referral to specialized resources. Most family physicians monitor their patients eating habits and physical activity, and provide counselling and referrals to self-help groups or dieticians for obese patients. However, they make fewer referrals to physical activity programs or fitness experts. Family physicians report not having enough time to counsel patients on smoking cessation or problem drinking. Reported barriers to conducting annual check-ups/periodic health exams on all patients include inadequate time (approximately 25 per cent) and lack of remuneration (approximately 20 per cent) (CPAC, 2007). There was limited information on the role of nurses in primary prevention. However, with the emphasis on the team approach in primary health care, nurses are poised to take on prevention roles within primary health care practices.

Cancer agencies generally provide some resources for prevention. For example, in British Columbia and Manitoba prevention programs are part of the population oncology department. The department focuses primarily on screening and surveillance. One cancer centre in another province includes a smoking cessation worker as part of its supportive care team. Aboriginal programs and genetics programs are also linked with prevention and population oncology.

Prevention is seen as an important strategy for future cancer control. As one hospital manager interviewed in the CWSS stated, "An ideal workplace in future will have fewer patients as we find ways to prevent cancer."

However, one program manager consulted noted that the human resources shortages were a challenge:

> "The shortage of family physicians/general practitioners is creating difficulties for potential cancer patients to get referrals to specialists for screening. This is a challenge to the efforts of prevention."

6.2.2.3 Genetics

Genetic predisposition is an emerging area for cancer prevention. According to one CWSS respondent, the expanding knowledge base of cancer genetics changes how we think of cancer as a disease. "No longer are we considering ductal vs. lobular breast cancer, which represents an anatomical/pathology approach; now we are considering luminal vs. basal breast cancer — a genetic approach."

The population-based rate of hereditary cancers is increasing. The management of families with hereditary cancers involves multiple visits and numerous human resources, many of which are in short supply — the long hours for medical geneticists noted in Chapter 3 of this report confirm this.

6.2.2.4 Aboriginal populations

Aboriginal populations are increasing more rapidly than the Canadian population as a whole — in some areas, comprising a significant proportion of the population. In northern areas, the percentage can be more than 50 per cent. Cancer outcomes have been traditionally poor due to cultural issues, poverty and competing health and social priorities. This can result in presentation to the medical system with advanced disease. In an international study of Inuit populations, Canadian researchers reported that:

- The health and disease status of the Inuit must be considered in its cultural and social contexts.
- Effective health promotion and prevention required the integration of traditional holistic approaches to Inuit medicine into the health care system (Gaudette et al., 1996).

Cancer centres are starting to make concerted efforts to reach out to Aboriginal Peoples and respond to their needs. Several examples of this were observed during the CWSS site visits. They included separately ventilated rooms in some health facilities to accommodate smudging ceremonies, entrance foyers and hallways featuring aboriginal art and the inclusion of other design features to make Aboriginal Peoples and remote populations feel more at home.

Several provinces have special training programs in place to train Aboriginal health care providers with the intention that they will return to their communities. Manitoba is using a community network model in one aboriginal community. Many issues that are beyond the scope of this report remain in providing culturally sensitive and accessible care to Canada's Aboriginal Peoples.

6.2.2.5 Issues identified by CWSS respondents

Some issues for prevention that CWSS respondents discussed include the:

- shortages of family physicians and nurses
- need for continued primary health care reform to encourage family physicians to work in team environments, in part to facilitate referrals of patients to targeted prevention programs
- need to document the challenges family physicians and primary health care teams face in delivering cancer control programs
- shortages in human resources for genetics, including medical geneticists, genetic counsellors and medical laboratory technologists to perform tests
- need to involve aboriginal communities over an extended period of time to developing trusting partnerships to achieve the inclusion of Aboriginal Peoples — this will be resource intensive and take 5 to 15 years
- need to blend Aboriginal Peoples' approaches to health, including their traditional medicine, with current cancer treatment.

6.2.3 Screening and Early Detection

Screening for cancer has the potential to reduce the incidence and severity of the disease. This will result in reduced cancer care workforce needs and other resources to treat and care for Canadians who develop cancer. Generally, organized approaches to screening that target sub-populations, based on the results of randomized controlled trials, are considered more effective and more cost-efficient in achieving reduced morbidity and mortality than are opportunistic screening approaches.

There is a need for careful planning for program implementation to maximize screening benefits and minimize harms due to additional diagnostic and treatment interventions. The latter can result from over-diagnosis of tumours that would otherwise never become clinically apparent. There is some opportunistic screening in Canada, or in the

absence of evidence from randomized controlled trials. This can result in less than optimal use of the cancer control workforce. One example is the use of the prostate-specific antigen (PSA) test for early detection of prostate cancer. In Canada, the PSA test has been carried out opportunistically since the early 1990s. The incidence peaks for prostate cancer noted in 1993 and 2001 have had profound implications for the human resources needed to diagnose and treat these patients.

6.2.3.1 Cervical cancer screening

Screening programs for cervical cancer in Canada began nearly 50 years ago, with the introduction in 1960 of a program in British Columbia. As of 2002, most provinces used an opportunistic approach to deliver cervical screening. Just two provinces (British Columbia and Nova Scotia) had implemented organized programs, which involve the use of a computerized information systems to track results and ensure specific guidelines are met for target age groups and screening frequencies. An organized approach contributes to cost-effective use of health care resources and optimal patient outcomes (Health Canada, 2002).

Cervical cancer screening relies extensively on family physicians. They inform women of the need for Pap smears, take the specimen smear from the woman's cervix, send the specimen to a laboratory for analysis and co-ordinate follow-up of abnormal results. However, nurses are also trained to take cervical smears — a procedure that is within their scope of practice. Recently, media campaigns have supplemented family physicians' recruitment of women for cervical cancer screening. As of 2002, no province had recruited women through invitation letters (Health Canada, 2002). Pathologists contribute to cervical cancer screening when examining tissues to make a diagnosis to confirm cancer or the extent of abnormal cervical cytology.

Basic and epidemiologic research over the past two decades demonstrates that the Human Papilloma Virus (HPV) is responsible for cervical cancer development. A major research CIHR-funded project funded is now underway to compare the effectiveness of HPV testing of cervical smears to the current Pap procedure (Coldman, personal communication).

6.2.3.2 Breast cancer screening

In 1988, British Columbia was the first province to implement an organized program for breast cancer screening. All provinces and the two territories implemented organized programs by 1998 (Public Health Agency of Canada, 2006). Organized programs are usually delivered in facilities specifically set up to deliver this service. Opportunistic

screening may take place in diagnostic laboratories or hospital departments that offer a wider range of procedures including ultrasound and X-ray. While screening in organized programs is recommended, diagnostic labs in the fee-for-service sector, for which monitoring data are not available, screen a fair percentage of women opportunistically.

An inter-professional team generally staffs organized programs. The team includes mammography technicians, radiologists, nurses, administrative support and health educators. An information system and standardized approaches to program delivery, with considerable emphasis placed on quality control and patient outcomes, supports the team. The Canadian Breast Cancer Screening Initiative Program, funded by the Public Health Agency of Canada, co-ordinates implementation at the national level. Representatives from federal/provincial/territorial health ministries, cancer agencies and stakeholders meet regularly to share experiences, collaborate on research projects and guide the development and use of the national database for program planning, monitoring and evaluation.

Various approaches have been taken to reduce wait times for follow-up of abnormal screens. A British Columbia study found that the most effective approach is to combine facilitated referral from the screening program to a breast assessment centre with facilitated surgical consultation and biopsy (Olivotto et al., 2001). Having the breast screening centre send the test results directly to the hospital responsible for further investigation, with the hospital responsible to contact the woman for further tests, had the largest single impact (and would save some family physician office time). The authors warn that medico-political challenges will need to be overcome before implementing facilitated referral.

There are breast assessment centres in some Canadian cities. For example, the Women's Breast Health Centre in Ottawa provides a comprehensive service to women with breast abnormalities to ensure a co-ordinated diagnostic work-up of breast problems. Co-ordinating all diagnostic procedures in one place reduces wait times. There is on-site psychosocial support. Research and education programs are also part of the program (The Ottawa Hospital, 2008).

Current issues with breast screening include how to improve participation rates and how to make the transition to digital mammography.

6.2.3.3 Colorectal cancer screening

Based on recommendations from a national committee convened in the early 2000s, program implementation is now underway in some provinces (Flanagan et al., 2003). A pan-Canadian committee organized under the auspices of the CPAC is co-ordinating the approach. Ontario was the first province to launch colorectal cancer screening in January 2007. These programs will use the Fecal Occult Blood Test (FOBT) to detect abnormalities. Family practitioners will provide the test kits. There is further examination of abnormal results by colonoscopy, generally conducted by gastroenterologists. Pathologists will make the definite diagnosis by examining biopsy tissues.

Current issues include the co-ordination of colorectal cancer screening with breast and cervical cancer screening and ensuring sufficient human resources exist to operate the programs. Various western countries identify colonoscopy capacity as an issue including the United States, Canada, the United Kingdom and The Netherlands (Twombly, 2004) (Vijan, Inadomi, Hayward, Hofer, & Fendrick, 2004) (Butterly, Olenec, Goodrich, Carney, & Dietrich, 2007) (Terhaar sive Droste, Craanen, Kolkman, & Mulder, 2006). Use of alternative care providers is one way to increase capacity. One Ontario study suggests that nurse endoscopists can provide safe and effective flexible sigmoidoscopy, with lower staffing costs (Shapero, Alexander, Hoover, Burgis, & Schabas, 2001). A US study recommends training dedicated endoscopists to meet demand (Vijan et al., 2004).

6.2.3.4 Human resources issues for screening

Some of the issues for cervical cancer screening identified in the CWSS include the:

- potential need to retrain cyto-technologists currently analyzing Pap smears, should the HPV process turn out to be a better approach
- availability of family physicians to take smears of cervix tissue (needed for both Pap and HPV tests) — this may be of greatest importance to women in the youngest age groups who are less likely to have a family physician
- opportunities to use nurses to take cervical smears
- increased need for medical laboratory technologists for HPV tests, particularly as HPV testing increases
- shortages of pathologists to make the diagnosis.

The human resources issues for breast cancer screening identified include the:

- shortages of mammography technicians/medical imaging people in several provinces related, in part, to the required extra training
- training mammography technicians (requires one extra year of education over the medical radiation technology program) — one province reported no graduates in the previous year
- job design of medical imaging so that mammography technicians do both ultrasound and mammography, reducing repetitive strain injuries
- process design of workspace and equipment to optimize use of staff time from when the woman first enters the screening facility
- required transition to digital mammography implementation to assess potential contributions to productivity
- insufficient numbers of radiologists.

The human resources issues for colorectal cancer screening include:

- in Canada, colonoscopy capacity is an unknown factor with two components:
  - the availability of endoscopists and endoscopy suite space
  - the impacts on capacity since some current colonoscopies are performed opportunistically for screening purposes.
- the potential to use nurse endoscopists to conduct sigmoidoscopy
- health promotion resources needed to increase family practitioners' and patients' awareness of the benefits of the test.

6.2.4 Diagnosis and Staging

Many occupations are involved in cancer diagnosis. These include:

- family physicians who are alert to patient symptoms
- dentists who identify potential oral cancers
- radiologists and nuclear medicine physicians who interpret medical images
- medical radiation technologists who provide the MRIs, CT scans, ultrasound nuclear medical tests that help identify tumours in patients
- surgical specialists who take the biopsy tissue upon which the diagnosis will be based
- pathologists who provide the definitive diagnosis based on examination of tissues.

Patient navigators, social workers, spiritual care providers and other supportive care workers can provide support and information starting with the patient's journey through the diagnostic process. The CWSS report focuses primarily on pathology, as one of the 10 selected occupations for further study, together with some information obtained on a multidisciplinary team approach to diagnostic assessment.

6.2.4.1 Pathology

Pathology and laboratory medicine are the heart of cancer diagnosis. Pathologists serve as society's "diagnostic oncologist." They contribute to multiple phases of the cancer control spectrum, from screening programs, through examining tissue specimens from surgical procedures, through predictive drug testing and for cancer recurrence. With the growing emphasis on personalized treatment and sub-cellular techniques, pathologists increasingly rely on medical laboratory technologists. An accurate pathology analysis is essential to ensuring patients receive the appropriate treatment. The Canadian media has publicized the consequences of errors in diagnosis due to inaccurate laboratory tests in Newfoundland and other provinces (Chorneyko et al., 2008).

As reported to the CWSS, pathology is becoming more complex, with increased capability to identify sub-sets of patients resulting in more personalized treatment options. Pathologists need to be familiar with molecular biology and proteomic tools. "The old ways are not enough and histo-chemistry now plays a major role in tumour/non-tumour pathology, while immuno-histo-chemistry (ER+, PR+, HER-2/neu +) requires even more specialization." Scientific advances have revolutionized work. Pathologists have been brought out of the basement to join the rest of the cancer team.

According to CWSS respondents from this profession, pathologists need to learn more about the clinical and technical side of their work and be able to communicate all of their findings to the oncologist — a written report is no longer enough. At the same time, synoptic reporting is encouraged to standardize reporting of information such as cancer stage and other prognostic indicators for data capture by cancer registries. Effective communication with surgeons, radiologists and lab technologists is needed to ensure the selection of the best treatment option. As a pathologist at a major Canadian centre said:

> "Pathology needs a new face; no longer is a pathologist an old guy in a wrinkled suit playing with dead body parts."

6.2.4.2 Impact of shortages of pathologists

CWSS respondents reported substantial shortages of pathologists of 20 per cent or more. Part of the reason is a lack of pathology residency positions (see Chapter 4). A June 2008 editorial in the CMAJ[24] proposed a three-pronged solution to the current pathology crisis:

- Take steps to increase the supply of pathologists and medical laboratory technologists.
- Fund quality assurance efforts.
- Fund a national body to co-ordinate quality assurance across Canada, set national standards, co-ordinate educational activities and guide human resources planning (Chorneyko et al., 2008).

Quality control has arisen as an important concern, given some of the situations reported in the media (Chorneyko et al., 2008). Pathologists interviewed for the CWSS called for the recognition of pathology as an art as well as a science and the existence of grey areas. Not all biological specimens fit readily into a well-defined diagnostic category. In larger laboratories associated with large teaching hospitals closely linked to cancer centres, reviews by other experts in the pathology department provide quality control. There are also reviews at multiple steps in the diagnostic process. In smaller labs, pathologists can ideally go to the regional centre to achieve the same level of review, but time constraints may limit their ability to do so. With the availability of digital pathology images and telehealth, consultations on difficult cases can be done remotely through the transfer of digital scans of tissue samples on slides.

Volume may also affect the quality of diagnosis. One pathologist reported to the CWSS that for ER and PR tests, laboratories must perform at least 250 tests annually to maintain quality. If all breast cancer samples are tested, then all provinces can support at least one lab. Another pathologist reported that the ideal volume of specimens examined per year, per pathologist ranged from 3,500 to 5,000.

According to one CWSS respondent, there are national co-ordinating bodies for pathology in other countries. The United Kingdom and Australia each have a Royal College of Pathology. The colleges certify pathologists, ensure that training and exams are appropriate and that on-going formal training and re-training programs are in place. In the United States, the College of American Pathologists (CAP) does not control exams but it does accredit hospital labs through inspection, regular quality assurance (QA) using test sets and technical and

24 CMAJ, Canadian Medical Association Journal

professional training. In Canada, accreditation of laboratories will be done under the next round of hospital accreditation. Currently, only two provinces have an accreditation process. One CWSS respondent noted the unfortunate dismantling, due to lack of funding, of the Canadian Tumour Reference Centre, which provided national co-ordination around diagnosis and quality control.

6.2.4.3 New approaches to diagnostic programs

It has been proposed that in an ideal future, women would have one-stop shopping for breast abnormalities to avoid delays in the diagnosis of breast cancer. Such a centre would go even further than do those described in the screening and early detection section (6.2.3) above. Women would arrive at the breast centre with an abnormal ultrasound or breast lump and the same team would co-ordinate all tests, biopsies and surgery. This would reduce waiting times and ensure appropriate diagnostic work-up and subsequent care. Along these lines, Ontario is piloting Diagnostic Assessment Programs (DAPs). DAPS aim to provide patients with co-ordinated care from their initial referral to a cancer specialist up to a definitive diagnosis of cancer (Cancer Care Ontario, 2008b). DAPs would offer patients customized information and education, and psychosocial support through inter-professional teams. Program structure and organization may vary to meet local realities such as geography. One systematic review found relatively few rigorous evaluations but, based on selected research studies, concluded that DAPs appear to decrease the time to arrive at a diagnosis. This leads to reduced patient anxiety and increased satisfaction (Gagliardi, Grunfeld, & Evans, 2004).

Nova Scotia implemented a Patient Navigator Program for breast cancer patients to guide women through the diagnostic process from the time of the abnormal screen result until the date of first treatment. One patient advocate said that long wait times are challenging to patients as emotions and stress factors affect them and their families while they wait for results.

6.2.4.4 Human resources issues

The human resources issues include:

- a shortage of pathologists, affecting wait times for diagnosis, including those for screen-detected tumours
- continuation for the foreseeable future of the shortages that have been ongoing for several years for pathologists and medical laboratory technologists — 50 per cent of MLTs are due to retire within eight years

- the need for more fellowships to provide financial support of pathology residents
- the need for on-the-job training — for three to five years once formal education is completed, with supervision by more experienced staff
- need for human resources standards for workforce planning
- need for centralized diagnostic centres to minimize wait times for various tests needed to confirm cancer diagnoses
- need for more communication among pathologists and oncologists to ensure reaching the optimal treatment decision.

6.2.5 Treatment

In this section, human resources issues in treatment are presented separately for radiation, surgical and systemic therapies. The section ends with a description of the community-based approach to providing systemic therapy. CWSS respondents reported that the models of care from 10 years ago are no longer relevant. This is, in part, due to greater integration of care among medical, radiation and surgical oncology. This increases the need for effective communication and inter-professional team-based planning. Patients no longer are referred in lockstep from diagnosis to surgeon, then to a radiation oncologist (as needed) and/or to a medical oncologist (as needed) to finish off their treatment path with systemic therapy. Rather diagnostic procedures may overlap with treatment. For some cancers, systemic or radiation therapy may precede surgery. Thus, there is a need for close collaboration to provide an integrated approach to treatment of cancers that require several treatment modalities to achieve the best patient outcomes.

6.2.5.1 Treatment — radiation therapy

About 35 centres across Canada provide radiation therapy. It is managed by the cancer agencies in most provinces or in tertiary care hospitals in Québec, New Brunswick, Prince Edward Island and, most recently, in Ontario. In an effort to deliver cancer care closer to the patients, British Columbia, Alberta and Ontario are expanding radiation programs to somewhat smaller centres. This is expected to increase demand for cancer care providers in several occupations in the radiation team and provide opportunities for the larger centres to mentor the smaller ones.

Four of the 10 selected occupations for this study play key roles in the radiation therapy team — radiation oncologist, medical physicist, radiation therapist and oncology nurse. Professionals in the radiotherapy departments generally work together over many decades, and can stay in the same centre throughout their career. This long-term

commitment to a particular centre or provincial program facilitates strong team building and considerable pride in the work. Radiation team leaders stressed the need for mutual respect and trust amongst all staff. As one CWSS respondent said, "We are all lifers here."

Technology explosion: Radiation treatment is in the midst of a "technology explosion." Imaging has had the largest influence, with MRI and CT scans now married to radiation machines. Imaging technology enables more precise targeting of the radiation beams to the tumour. It is also used to monitor patient responses to treatment. Complementary, molecular-based therapies, which interact with radiation therapy, make tumours more radiation sensitive. Further, as more is learned about how normal tissues react, doses can be directed more precisely at tumour tissues and normal tissue protected. All of these innovations lead to treatments that are more precise and improve patient outcomes.

Radiation machines are increasingly sophisticated and constantly evolving with more and more computerized systems, and staff must be active in continuous professional development. Workload changes entail fewer, more intense doses, with more time needed to plan treatment, but with little information available on costs and cost savings. Informatics developments include the incorporation of CPGs into computer programs for planning purposes. This helps to keep all care providers on the same page with treatment protocols when multiple team members are involved in developing, implementing and monitoring treatment plans. As one medical physicist consulted in the CWSS pointed out, "We need to bend technology to our program and not just be us working for the technology."

Quality Assurance: With the rapidly changing work environment, careful attention must be paid to quality assurance. One radiation therapy manager reported that, with the ongoing automation of processes, workers are relying more and more on the technology. There must be a balance between relying on the computer and the common-sense check.

Several CWSS respondents reported that medical physicists are becoming more and more like project managers. They are more focused on process, quality assurance and implementation of new technologies and software, including the need to train staff. Another medical physicist commented that the role of the physicist is expanding as other areas of cancer care incorporate technology such as medical imaging, robotic surgery and some aspects of systemic therapy (e.g., image guided stem cell placement).

Team composition: Radiation teams comprise radiation oncologists, medical physicists, dosimetrists, radiation therapists, electronics technicians, nurses and administrative staff. Team members must all work closely together to ensure patients receive the appropriate treatment. New roles (e.g., physics associates and advanced practice radiation therapists) are being developed to try to sustain workload when some occupations are in scarce supply. Teams may continue to expand and evolve to meet future needs by integrating other disciplines such as radio-chemists, systemic therapists and more real-time pathology. With roles evolving across the radiation therapy team, all team members must be alert to understanding what each team member can contribute.

Communication with other treatment teams is increasingly critical due to the greater integration of various treatment modalities. This includes medical oncology regarding systemic therapies and surgical oncology for combined treatments. For example, with pre-operative radiation therapy, surgeons draw where they are going to cut. Radiation therapy is then designed to avoid that area of skin. This makes it possible to proceed with the surgery sooner, as there is no need to wait for surgical incisions to heal at the radiation therapy site.

These new developments make inter-professional care conferences increasingly essential to plan treatment. One CWSS respondent reported that all disciplines needed to be in the room to plan effective care for disease areas that are especially challenging.

Team infrastructure and leadership: Effective teams require good communication and supportive infrastructure. This includes clerical and administrative staff. Several leaders stressed the need to seek advice and input from all staff in introducing new processes or equipment. Managers need the ability to gather team members together (e.g., to hold "think tanks") and to build meeting times into the treatment schedules.

Management and leadership models can be quite complex. In some provinces, the radiation oncologist provides leadership for medical aspects, and the senior radiation therapist takes the lead on administration. In British Columbia, where care is co-ordinated provincially across all the cancer centres, there are multiple reporting systems in place. In Ontario, provincial committees with one representative per centre are convened to co-ordinate care issues for individual occupational groups (e.g., for medical physics or radiation therapists).

Several CWSS respondents noted the need for leadership development to enable staff positions to be filled internally, when management positions became vacant. Suggested human resources policies included:

- Create intermediate supervisory or middle management positions (several respondents noted they currently have a broad span of supervision).
- Rotate department chairs (e.g., for medical physics) as is done in academic centres.
- Provide for acting appointments with pay when a regular staff member is on leave.

Scheduling issues can be complex. Not all staff can work on new equipment at all times. Some staff may be unmotivated to work on older, simpler machines. In some cases, shift lengths must conform to collective agreement requirements.

Costs: CWSS respondents called for recognition of the complexity of treatment in reimbursement models. The system should recognize the true costs for effective planning. Ideally, studies are needed to demonstrate that technology can save dollars. Overall, most CWSS respondents reported the need for more time to plan and deliver radiation therapy. Only one respondent (from a large centre) reported treating more patients at the same cost because new technology reduced the number of checks that were needed. For some cancers (e.g., early stage prostate cancer), new equipment allows the dose to be delivered in fewer fractions. Therefore, treating patients takes less time.

Balancing patients and technology and time allocation on the job: Radiation team managers were aware of the ongoing need to balance the technology with patient needs. As one CWSS respondent stated:

> "At the same time we have to keep our work human, and care for the patient. We have opportunities to provide an atmosphere of learning and growing and interest for personal/professional development — there is always something new."

Radiation therapists with broader education are more willing to embrace changes and be involved in research projects, education and management activities. However, another radiation team manager consulted in the CWSS noted that all team members must appreciate that the importance of the time taken for planning, research and education — the "attitude is that if I don't see you are working with the equipment or a patient then you're not."

6.2.5.2 Issues for human resources planning for the radiation therapy team

Issues for human resources planning for the radiation therapy team are:

- Increasing technology permits more precise targeting of tumours (e.g., image guidance) and results in more time to plan and deliver treatment and a huge training component.
- There is a need to understanding the net impact on human resources requirements for the *whole* team of new roles such as physics assistants and advanced practice radiation therapists, or the greater use of dosimetrists.
- Most planning in Canada is for radiation oncologists. In other countries, the whole team is included in workforce studies, making it possible to consider the impact of all the various roles.
- There is a need for dedicated funding for a national workforce study for medical physicists.

6.2.5.3 Treatment — cancer surgery

Although cancer surgery is the most common modality of cancer treatment, little information on human resources issues was found in the scientific literature for Canada, or elsewhere, as confirmed by the sole surgical oncologist the CWSS was able to interview. Surgical oncologists are generally associated with academic health centres. There, most have an integrated academic and clinical role. Surgical oncologists are integrated into the cancer agencies in British Columbia, Alberta, Ontario and Nova Scotia.

In Canada, surgical oncologists (who focus on highly specialized or rare surgical procedures) do not perform the majority of cancer surgery. Rather, it is by general surgeons, some of whom have additional training in oncology. Cancer surgery may be performed in hospital settings. These range from small community hospitals, staffed by a general surgeon who performs a wide range of procedures for many diseases, up to large tertiary care teaching hospitals housing numerous highly specialized surgical teams focusing on one body system (e.g., neurosurgery or gynaecological surgery). Some surgery may be done in day surgery or on an outpatient basis. Some minor surgery for skin cancer can be performed in dermatology or family practice setting. The *Summary Report: Pan-Canadian Cancer Workforce Challenges and Issues* (Wortsman and Janowitz, 2008, unpublished report) (known as the "climate study") indicates that greater co-ordination of the cancer control system is needed with general surgeons, who should be exposed to the full range of cancer care during their training. Further, some

climate study respondents reported that the goal of improving access and wait times to surgery was hampered by the lack of dedicated resources such as beds, operating rooms and access to diagnostic procedures — as is often the case for other clinical programs.

Given the wide range of settings, ensuring all patients receive appropriate care for their cancers according to clinical practice guidelines is a challenge for cancer control in Canada. One study found lower uptake of radiotherapy for breast cancer following breast conserving surgery in Ontario than in British Columbia. It concluded that while patient, tumour and physician factors are associated, in part, with the initial treatment choice, there are other possible explanations — such as the presence of provincial guidelines, differences in the organization of the health care system or differences in patient preference. These require further research to confirm their contribution (Goel et al., 1997).

Some provinces, including British Columbia, have established surgical networks to keep surgeons in the community up-to-date with the latest information and guidelines for cancer surgery, and to give insights into who should be doing what in terms of the roles of the surgical oncologist vs. the sub-specialized surgeon. Still, there is variability across the country about what cancer surgeons do. Scope of practice may vary by province. Employers largely determine this, as opposed to legislation or certification.

Concern exists that new, innovative, high intensity procedures are not equally available across Canada due to insufficient resources. For example, one Canadian study found divergent mastectomy rates among Canadian regions. This indicates inconsistent adoption of less-invasive therapy despite a publicly funded health care system and national consensus guidelines (Gaudette et al., 2004).

As with other treatment areas, surgery has experienced considerable change. Imaging techniques to show exactly where the tumour is located in the body and the emerging area of robotic surgery are just two examples. With funding pressures on hospitals to reduce costs and with newer less invasive techniques, more procedures are performed as day surgery. Further, despite increases in the numbers of new cancers, the total average length of stay in hospital declined for breast, prostate, lung and colorectal cancer between 1991 and 2000. These declines were partly due to changes in the health system and patient characteristics. However, some were the result of changes in clinical practice style, with a move to less invasive techniques, including breast conserving surgery for breast cancer and anterior resections for

colorectal cancer, avoiding the need for colostomy (Neutel, Gao, Wai, & Gaudette, 2005).

There are limits on the CWSS analysis of human resources issues for surgeons due to the lack of population-based health services type research in the scientific literature and the difficulties in finding surgeons with time to participate in the CWSS. Perhaps this is unsurprising, given the very high average weekly hours that surgeons work.

6.2.5.4 Issues for human resources planning for surgical treatment

Issues for human resources planning for surgical treatment are the:

- lack of data on numbers of surgical oncologists and cancer surgeons, making it difficult to quantify the apparent shortages
- lack of information on how surgical oncologists are integrated within the surgery team
- lack of information about the role of surgeons in providing cancer care.

6.2.5.5 Treatment — systemic therapy

Medical oncology is a relatively new discipline. It emerged in the 1970s as a sub-specialty in internal medicine. Initially, most medical oncologists were associated with a cancer centre. However, systemic therapies are now offered in tertiary hospitals in major centres and, increasingly, in local hospitals through a community network approach — with appropriate centralized training and support for oncology nurses, pharmacists and family physicians. Some systemic therapy is provided in the home through home care nurses and the use of ambulatory infusion pumps. Systemic therapy includes chemotherapy, plus other agents such as hormonal treatments of monoclonal antibodies that may be used for both curative and palliative care. Medical oncologists also administer drugs for supportive care management. They are commonly involved in palliative care. Drugs may also be provided for symptom management.

Treatment advances: Profound changes have occurred over time in the nature and extent of systemic therapies offered to patients. Drugs and related therapies are now more costly and more toxic. Staff must be prepared to provide a quick response to adverse reactions. More lines of therapy are available. Some individual therapies now continue over longer periods, with patient treatment extending for years, rather than

months. Therapies are more individualized to ever-smaller sub-sets of patients and tailored to the patient's tumour characteristics.

Guidelines are developed by tumour groups in relation to national standards. This enables chemotherapy drug dispensing to be automated, printed and linked to the guidelines. Overall, there is a need to balance costs and toxicity and the potential benefit of the therapy to improve patient outcomes and quality-of-life.

New technology, including infusion pumps, must be implemented carefully to avoid medical error and patient death. One Alberta case study documents the complex communication and process interactions among pharmacist, nurse, technology and patient in a miscalculation that contributed to a fatal overdose. As a result, there were a number of recommendations to improve procedures. The most recent pumps now have built-in "guard rails" to minimize the potential for overdose (ISMP, 2007).

Team Membership: The medical oncologist collaborates closely with the oncology nurse and pharmacist to deliver the treatment plan. New roles are being created to assist medical oncologists. These include physician assistant (MSc training), general practitioner in oncology, nurse practitioner and clinical assistant (e.g., foreign-trained physician who is not licensed in Canada).

Management Issues for cancer centre: With the devolution of systemic therapy from the cancer agencies to regional health authorities and hospitals, managing partnerships and relationships is critical. At the same time, programs must retain some accountability to manage adverse reactions. Cancer agencies are continuing to develop infrastructure to support community networks, with central staff to respond to queries, co-ordinate program development and training.

Electronic patient charts are partially implemented in some centres. This enables a physician in Flin Flon to dictate notes that appear in Cancer Care Manitoba's databases in Winnipeg. While the electronic health record is not perfect or complete, it is part of the 10-year plan for Manitoba. In British Columbia, telehealth was thought to be helpful, but it could not replace needed face-to-face time with patients to deal with the emotional aspects of care. Yet, telehealth is used widely in some areas to link with community networks in rural and remote northern regions.

New approaches to deliver systemic therapy: A 2007 *Cancer Care Ontario Report* looked at the best way to organize the delivery of ambulatory systemic treatment in Ontario (Vandenberg et al., 2007).

The report provides a practical framework to guide the standardized delivery of evidence-based systemic treatment province-wide, in hospitals beyond the confines of regional cancer centres. This framework aims to provide safe, evidence-based systemic cancer treatment, maximize the use of resources, and employ the principle of patient-centred care — emphasizing care close to the patient's home.

This report provides an example of a model to consider in re-organizing systemic therapy treatment programs and identifies roles of different occupations involved on the systemic therapy team. In support of this work, Cancer Care Ontario (CCO) is currently working on a health human resources planning model. The model will categorize the different service models across the province delivering systemic therapy. It will also identify the HHR requirements for medical oncology, advance practice nursing, RNs, pharmacy and general practitioners with oncology training. The mandate is to determine the needed resources by using planning models currently in place in CCO, plus other possible models. A potential challenge is obtaining information from the smaller centres and regions of Ontario as, to date, there has only been work in the larger centres.

An earlier article on integrating cancer service delivery in Ontario found "that little action had been taken," and that "traditional biases, turf protection, political minefields and perhaps even restructuring fatigue had been excuses to stand still." (L. J. Thompson & Martin, 2004)

6.2.5.6 Issues for human resources planning for systemic therapy

The human resources issues for systemic therapy include:

- shortages of medical oncologists which are not well-documented due to lack of data
- the need for close collaboration of systemic therapy team members
- safety issues with new procedures requiring good communication and team-based training
- the movement to community-based therapy, which requires good planning and communication — this is explored further in the next section.

6.2.6 Community networks for systemic therapy, supportive care and palliative care

Community networks offer an effective model for delivery of systemic therapy and other relatively complex cancer care closer to the patient's home. The model for community networks was developed in 1978 in

Manitoba (Schipper & Nemecek, 1991). New therapies were benefiting cancer patients, with cancer becoming a chronic disease. These authors recognized that care could be managed in the community as a joint venture linking the community to the specialist centre, and ensuring comparable care and clinical research in both settings. Required steps are to:

1. Establish a set of national guidelines throughout the spectrum of cancer control.
2. Direct efforts to determine what can be done best in each health care setting (cancer centre, tertiary care hospital, community, volunteers).
3. Distinguish aspects of care that are operationally simple that can be moved back into the community.

Cancer agencies and tertiary centres must be empowered to do what they do best:

- Use multidisciplinary expertise for research.
- Establish therapeutic standards and evaluation mechanisms.
- Treat rare and complex disease.

Tertiary cancer centres should also seek strategic alliances among equals to co-ordinate education programs and for information technology support to permit communication of information between the specialist and the “hands-on” community physician.

Northern and other parts of Ontario and British Columbia have implemented this model. In Canada, community networks currently have a primary focus to provide systemic therapy for acute and palliative patients but the potential exists to expand their activities across most of the cancer control continuum. A CWSS researcher visited one centre where the program was clearly serving as a focal point for cancer care in a small community, including supportive care for patients and families. The BC Cancer Agency has set up networks to co-ordinate a variety of cancer services including provider groups (e.g., family physicians and surgeons) and others for community oncology, palliative care, psychosocial, rehabilitative and nutrition and paediatric oncology.

Communication and support from the central network office located in the cancer centre/agency is vital to support the community staff. Telehealth facilities enable the patient and nurse to consult the medical oncologist or other central team members to provide guidance on patient progress and care, and simultaneously view CT or other digital scans. Telehealth consultations are now routine in some areas of Canada, as observed during CWSS site visits. The electronic health

record ensures that all health care providers have access to the same information in real time.

The National Health Service in the United Kingdom has established networks for cancer care as a means of streamlining patient pathways, information sharing and exchange of best practice models among the various professions and organizations (Addicott & Ferlie, 2007). In Canada, there are opportunities for physicians to share at the national level, including the Canadian Association of General Practitioners in Oncology (CAGPO) and participation in CAPCA committees such as Cancer in Primary Care.

A recent evaluation of the Manitoba program found "the most frequently needed kinds of help (e.g., with general medical problems, quick referrals, taking extra time, quick office appointments) were well-provided by family physicians, but family support was not. Higher quality-of-life scores were associated with more help with general medical problems, more provision of cancer-related information and more emotional support of patients and their families." The authors concluded that "family physicians respond well to the most common needs of cancer patients and should be pro-active in offering their support to both patients and families" (Sisler, Brown, & Stewart, 2004).

6.2.6.1 Program organization and team membership

Community systemic therapy programs are generally located as an outpatient unit in a community hospital due to the need for strong pharmacy support and access to emergency room services to deal with any adverse reactions. Team members typically include one or two family physicians with some training in oncology, oncology nurses and a pharmacist and/or pharmacy tech as core team members. Other members may include administrative support, a supportive care worker, a social worker and other professionals. In small centres, most team members need to split their time between the chemotherapy unit and other hospital duties. Providing back up for key positions to cover for vacation or sick leave or for training absences is a challenge, given the small number of positions and the need for those filling in to have specialized training.

The team is responsible for delivering the systemic therapies as prescribed by the medical oncologist at the host cancer centre and ensuring the safety and well-being of their patients. The aim is to deliver quality care closer to home and to deliver quality of life to the patient. Patient needs go beyond clinical treatment. Community network staff can become involved in other aspects of care including arranging travel and accommodation at the regional cancer centre,

helping with financial issues caused by treatment costs that are not publicly funded and bereavement support. Community network programs also have the potential to be focal points for care across the cancer control spectrum, but funding and mandate issues may limit this.

There is a need to give close consideration to co-ordinating the specialized cancer services that the chemotherapy unit staff provide with the patient's general health care needs, normally provided by the patient's family physician. In small communities with high turnover in family physicians, this can be challenging. In one network serving as a focus group for the CWSS, network staffs are highly committed to serving their community, even though at times they are challenged to find the emotional strength to treat their friends and neighbours. This is not easy. As one team member said, "Seventy-five per cent of our patients die, and this year several have involved family members of our hospital staff."

6.2.6.2 Training

Training community staff is centrally organized. The initial training is on an in-person basis. It is supplemented with ongoing training and updating through telehealth. In Manitoba, training is four weeks for nurses, two weeks for physicians and one week for pharmacists. In British Columbia, training for physicians is eight weeks with six to eight people per session. British Columbia also has the ability to link up local cancer facilities with the main centre in Vancouver for seminars and teaching purposes. In Ontario, telehealth is used for training and for webcasts that busy health care providers can access on their own time. Distance learning is also available, making it possible for nurses to train in their own communities. Other ongoing training may be offered as weekend conferences, including the Community Oncology Professional Education (COPE) program from the Regional Cancer Program in Thunder Bay. COPE has the advantage of bringing all team members together in an inter-professional setting.

6.2.6.3 Issues related to program management and organization for systemic therapy

- Staffing in local communities — since systemic therapy must be delivered year-round, there is a need for two to three trained staff for each function to provide coverage for vacation, training and sick leave.
- There may not be a full-time workload in the cancer program so it may need to share staff with other hospital programs and deal with collective agreements on specific shift lengths.

- Unit staffs have the potential to serve as a focal point to provide a broader range of services to all cancer patients in the community, with appropriate funding and infrastructure put into place. For example, staff in such units could also provide support and education for radiation and palliative care patients.
- A further challenge is how to integrate the chemotherapy units with broader developments in primary health care.

6.2.6.4 Funding and Remuneration Issues

- One centre based funding formulas on the number of new patients admitted each year. They did not account for the prevalent patients who are growing in number due to improved survival and longer time spans for treatment of years, rather than weeks or months.
- Funding formulas also do not account for the ever-increasing complexity and toxicity of the treatments, particularly evident in the past couple of years.
- Funding in one centre did not cover the costs of laboratory services, ancillary drugs, diagnostic imaging, housekeeping, laundry or time spent by outpatient chemotherapy nurses on acute care units — all of which the hospital's global budget had to absorb.
- Funding of staff time to take training.
  - FFS physicians need separate reimbursement for training time, since there is no fee code for training.
  - Time for training for nurses can also be limited, and may not be fully reimbursed.
- Further as one CWSS respondent asserted:

  "We are asking family physicians to do far more than they were trained to do, in terms of supervising chemotherapy, pain and symptom managements. Remuneration models need to reflect the complexity of the care and the time involved."

6.2.6.5 Shortages in human resources

- Shortages of family physicians, who must also receive training in oncology, limit the ability of programs to thrive.
- Hiring pharmacy technicians can compensate for pharmacy shortages, to some extent.
- Programs require trained oncology nurses to be in place.
- The shortage of family physicians and nurses in small rural/remote communities leads to ongoing concerns that, if a committed, trained

family physician or nurse leaves the community, finding and training a replacement can be challenging and disruptive.

6.2.7 Supportive care

Supportive care is closely linked to other treatment modalities, including palliative care. In the community network programs described above, the same care providers offered both supportive and palliative care. They followed the patients from curative systemic therapy, through remission and follow-up care, to recurrence, death and bereavement. Supportive care workers participating in the CWSS focus groups included a chaplain, a clinical psychologist, social workers, a dietician and oncology nurses. Their role in the cancer program is to help patients deal with psychosocial issues. These could range from emotional distress at the time of diagnosis, to practical issues around travel and accommodation for treatment, to attending to spiritual needs near the time of death. The CWSS did not include various other members of supportive and rehabilitative care such as occupational therapists, physiotherapists, art and music therapists.

More cancer centres are becoming aware of the need for psychosocial oncology services. A number of CWSS respondents providing health care discussed this. Psychosocial oncology is a whole-person approach to cancer care. It is concerned with understanding and treating the social, psychological, emotional, spiritual, quality-of-life and functional aspects of cancer, from prevention through bereavement (Canadian Association of Psychosocial Oncology (CAPO), 2008). It addresses a range of very human needs that can improve quality of life for people affected by cancer. There continue to be barriers to including psychosocial oncology as part of the oncology team. Most centres that the CWSS consulted shared psychosocial services with other departments of their hospital. Patients are often not aware that they can have access to psychosocial help, such as a psychologist or social worker and/or what services they can receive. Psychosocial support should be integrated into all parts of the cancer control continuum, as one participant consulted for the scoping study suggested.

One Canadian study of a community health region in Ontario found a range of generalist programs, with no specialization in addressing the unique needs of cancer clients, delivering supportive cancer care. There was no clear evidence of leadership for co-ordinating supportive cancer care. At any given point in time, multiple programs most often provide client care (Brazil et al., 2004).

A small Manitoba study found that “cancer care is organized in a sequential, parallel, or shared manner between family practitioners

(FPs) and cancer specialists, with sequential care a common outcome if there is a decline in the patients' relationships with their FPs. Cancer patients can lose contact with FPs because of patient or physician relocation, distrust over delays in diagnosis, failure to perceive a need for FPs, poor communication between FPs and specialists and a lack of FPs involvement in the hospital. People with cancer value FPs for being accessible through prompt appointments and telephone contact, for providing emotional and family support, and for referral, triage and general medical care. Family physicians can enhance care of cancer patients. Contact with FPs can be maintained by ensuring good communication between specialists and FPs, defining a clear role for FPs, addressing concerns about delays in diagnosis and referring patients back to FPs, particularly after hospitalization" (Norman, Sisler, Hack, & Harlos, 2001). One nurse practitioner supported these findings, suggesting the establishment of wellness follow-up clinics as a way to enhance the care provided to cancer survivors and their families. In this model, the nurse practitioner can assume the key role and contact for patients, working with other health care team members accordingly.

There is underfunding and underdevelopment of supportive care in the Canadian cancer programs. As one team member said, "We have a new mechanism for funding for supportive care, but we are still five years behind."

6.2.7.1 Issues in human resources planning for supportive care

Supportive care needs:

- adequate funding
- to be seen as a full partner in cancer care
- integration with primary health care in the community.

6.2.8 Palliative care

Formal palliative care in Canada began in 1974-75 at teaching hospitals in Winnipeg and Montreal. Unlike the traditional models of private hospices developed in the United Kingdom and then in the United States, Canadian palliative care services tend to incorporate a palliative consultation team within institutions and home care services, such as the Community Care Access Centres in Ontario. Today, these programs continue to evolve. They are increasingly integrated across a variety of institutional and community-based health care settings, including acute care wards in hospitals for initial consultations, tertiary palliative care units, chronic care units, cancer centres and home care. While individual programs vary, most aim to provide a comprehensive range of services using an interdisciplinary team approach. It involves doctors,

nurses, pharmacists, social workers, spiritual advisors and volunteers, among many others. Tertiary palliative care units tend to have about 12 to 20 patient beds. They try to provide a home-like atmosphere with regular furniture, bed coverings and window coverings, plus common areas and outdoor space to meet needs for meditative, quiet visiting and more active pursuits. Palliative care programs in Canada offer a comprehensive range of services. These may include relief from pain and other symptoms, psychological and spiritual care, a support system to help patients live fully until death, and support and bereavement for the families. Most palliative care patients have a cancer diagnosis (Gaudette et al., 2002).

Standards for palliative care in Canada are well evolved due to a 10-year consensus-building process that the Canadian Hospice Palliative Care Association led, with funding from Health Canada. This report develops a clear vision for hospice palliative care, based on nationally accepted principles and norms of practice. It provides the definition, values, guiding principles and foundational concepts that form the basis for hospice palliative care that may be offered in any setting, from home care to tertiary care centres, and norms of practice and application of the model to other activities, such as education, quality management, research, policy and funding, and consumer advocacy and marketing (Ferris et al., 2002).

Canadian research has documented improved outcomes when family physicians are available to support palliative home care. A Nova Scotia study found a significant association between family physician continuity of care and fewer emergency department visits during the end-of-life (Burge, Lawson, & Johnston, 2003). Continuity of family physician care was also associated with more deaths at home for those with advanced cancer (Burge, Lawson, Johnston, & Cummings, 2003). Based on these findings, models of integrated service delivery for end-of-life care should incorporate such continuity. Again, this is possible through the primary health care team approach.

In Alberta, introduction of comprehensive, community-based palliative care services in Edmonton and Calgary was associated with increased use of palliative services by dying cancer patients, up from 41 per cent to 81 per cent between 1993 and 2000. Identifiable public health care services cost $28,093 per terminally ill cancer patients in their last year of life. Of these costs, acute care accounted for 67 per cent, physicians (10 per cent), residential hospice care (8 per cent), nursing homes (6 per cent), home care (6 per cent) and prescription medications (3 per cent). Increased costs associated with the introduction of palliative care programs were offset by cost savings realized when terminally ill cancer patients spent less time in hospital, resulting in overall cost neutrality

(Fassbender et al., 2005). Another Alberta study explored spirituality in palliative care, finding that "while spirituality was difficult to describe, it was a shared experience often tangibly present in the provision of care on all levels" (Sinclair, Raffin, Pereira, & Guebert, 2006).

A UK study found that patients who had the additional input of the palliative care team demonstrated a statistically significant greater improvement in pain control. This improvement was thought to be due to the enhanced knowledge and skills of the hospital specialist palliative care team (Jack, Hillier, Williams, & Oldham, 2006). A systematic review of palliative day care programs found evidence of high satisfaction among patients. There was insufficient evidence on whether this improves symptom control or health-related quality of life. The study recommended further research into the potential benefits of various models of care for relatives and caregivers (Davies & Higginson, 2005).

Documenting the benefits of palliative care can be difficult due to the nature of the patient population being studied. However, despite the apparent advantages of offering palliative care through an inter-professional team approach, CWSS respondents expressed frustration at the lack of connection between the oncology team and palliative care:

> "Oncology community needs to recognize and accept that a significant proportion of their patients will die from cancer — they need to overcome resistance and discomfort with this reality."

6.2.8.1 Issues raised regarding human resources in palliative care

There is a need for:

- better integration of palliative care with oncology care so that patients and families experience a seamless transition
- addressing shortages of palliative care physicians
- better recognition and funding of programs
- opportunities to link palliative with primary health care.

6.3 Cross-cutting Themes Underlying Work Re-Organization

This section of Chapter 6 examines four crosscutting themes that emerged from the initial interviews and literature review and that were explored further in subsequent interviews, site visits and focus groups. These themes reflect the reality of a cancer control workforce in transition. The move to patient-centred care, together with the

increasing integration of care across the cancer control continuum, leads to the need for inter-professional teams. In turn, a team environment plus shortages in key areas fosters the development of new occupational roles. The complexity of all the many interactions among providers, care settings and technology points to the key role of process mapping to optimize use of human and other resources to provide the best patient outcomes.

6.3.1 Patient-centred care

According to the Institute for Health Care Improvement, "Care that is truly patient-centred considers patients' cultural traditions, their personal preferences and values, their family situations and their lifestyles. It makes the patient and their loved ones an integral part of the care team who collaborate with health care professionals in making clinical decisions. Patient-centred care puts responsibility for important aspects of self-care and monitoring in patients' hands — along with the tools and support they need to carry out that responsibility. Patient-centred care ensures that transitions between providers, departments and health care settings are respectful, co-ordinated and efficient. When care is patient-centred, unneeded and unwanted services can be reduced" (Institute for Health Care Improvement, 2008).

A number of relatively recent articles focusing on patient-centred care for cancer patients were found in the scientific literature. Notably, many articles linked patient-centred care to the use of inter-professional teams.

One very small study of primary care in Scotland found that patients and caregivers identified five significant times — around diagnosis, during treatment, after discharge, at recurrence and in the final weeks of life. At each of these key times, the patients identified five major concerns: information, communication, equity, a holistic approach and patient-centred care (Kendall et al., 2006).

A US study described how patients and families could be integrated into the care delivery model by involving them in planning and decision-making, noting that patient-centred models may require an unanticipated level of commitment and significant adjustments in organizations (P. R. Ponte et al., 2003). In the United States, implementation of a specialized multidisciplinary clinic for follow-up care for childhood cancer survivors, supported clinical efficiency and fostered seamless patient-centred care (Carlson, Hobbie, Brogna, & Ginsberg, 2008).

Positive effects of intensive Patient-centered [sic] Management (PCM) in a California health maintenance organization were found in a prospective cohort study. Fewer PCM oncology patients elected either chemotherapy or radiation. PCM patients had reductions in inpatient diagnoses indicative of uncoordinated care: nausea (-44 per cent), anaemia (-33 per cent) and dehydration (-17 per cent). They also had reduced hospital utilization with 38 per cent fewer inpatient admissions, 36 per cent fewer inpatient hospital days and 30 per cent fewer emergency department visits. PCM patients did use 22 per cent more home care days and 62 per cent more hospice days but, overall, there was a cost reduction of 26 per cent. This did not shorten patients' lives — 26 per cent of PCM patients died vs. 28 per cent of patients who received usual management (Sweeney, Halpert, & Waranoff, 2007).

In the United Kingdom, specialist cancer nurses reported that the treatment agenda relegated supportive care to a subordinate position. Yet, the authors observe that "access to supportive care is a central tenet of current cancer policy and crucial to the philosophy of patient-centred care" (Willard & Luker, 2005).

The Canadian Advocacy Coalition of Canada (CACC) conducted a Canada-wide survey to determine the extent of primary nursing in outpatient cancer clinics (Hryniuk, Crooks, Fitch, Rush, & Savage, 2007). The primary nursing model was developed to improve family-centred care and meet the expectations and goals of families in cancer care. There was more recognition about the importance of continuity of care to the patient that the nurse could provide. Primary nursing emphasizes continuity of care and the accountability of a single nurse to manage a patient's care plan. The primary nursing model is considered to lead to a higher degree of job satisfaction among nurses because they have the responsibility, authority and autonomy to carry out their professional role. Results indicate a lack of follow-up to ensure that patients carry out nursing plans and the evaluation of results. Hryniuk observes, "It appears that Primary Nursing may be an operational title rather than a descriptor of roles and responsibilities." Remarkably, almost one third of oncology nurses' time is spent on clerical and non-nursing duties, taking away their time and focus from attending to the needs of patients and families.

Patient-centred care was an integral part of the delivery of palliative care through multidisciplinary teams (Nelson & Walsh, 2003). Another US study demonstrated that "by individualizing patient and family assessment, effectively employing existing resources and aligning services with specific patient and family needs, it is possible to expand access to palliative services and improve quality of care in ways that are

financially feasible and acceptable to patients, families, clinicians, administrators and payers" (Byock, Twohig, Merriman, & Collins, 2006).

6.3.2 CWSS respondent's views on patient-centred care

Cancer care providers, although overwhelmed at times with the rapid pace of change and the unending stream of patients, kept coming back to how they could better meet the needs of their patients:

> "It's important to make the connection with families and patients."
>
> "It is important to stay close to patients." (Medical physicist)
>
> "…need to understand links between HR and patient outcomes and consider outcomes that the patient thinks are important"
>
> "Patients are overwhelmed with diagnosis and information."
>
> "The patient will be healthier if we deal with psychosocial issues."

6.3.3 Inter-professional teams

Increasingly, effective development and deployment of inter-professional teams is seen as critical to realizing the advantages of providing patient-centred care. Generally, this report uses the term inter-professional to refer to what the literature frequently refers to as "interdisciplinary," and sometimes as "multidisciplinary," and in parallel with definitions developed for inter-professional education that Chapter 4 of this report discusses. However, this section will use the term as cited in a given scientific article.

6.3.3.1 Definitions

Inter-professional education is well-defined as occurring when two or more professions learn with, from or about each other to improve collaboration and the quality of care (CAIPE, 2008). Several definitions were found that discuss multidisciplinary or inter-professional teams.[25]

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25 Health Canada defines collaborative patient-centred practice as:

> *"the practice designed to promote the active participation of each discipline in patient care. It enhances patient and family centred goals and values, provides mechanisms for continuous communication among care givers, optimizes staff participation in clinical decision making within and across disciplines and fosters respect for disciplinary contributions of all professionals " (Health Canada, 2007b).*

Interdisciplinarity has been defined as: the interaction among two or more different disciplines ranging from simple communication of ideas to the mutual integration of organizing concepts, methodology, procedures, epistemology, terminology, data and organization of research and education in a fairly large field (Olynyk, Varcoe, Stajduhar, & Bruce, 2007). According to the

As characterized by Olynyk for interdisciplinary palliative care teams, team identity supersedes individual professional identity, with traditional disciplinary boundaries being maintained with some functional crossover. In such teams, each discipline provides an assessment. Care goals are established through consensus. Leadership revolves among team members based on the task. Information sharing occurs primarily through discussion.

6.3.3.2 Team effectiveness

Much of the literature on the effectiveness of teams in cancer care comes from the United Kingdom, where the National Health Service (NHS) has put a National Cancer Plan in place. This plan recommends multidisciplinary teams (MDTs) for cancer services to bring specialists in all relevant disciplines together — from diagnosis through palliative care, to ensure clinical decisions are fully informed and to co-ordinate care effectively (Haward et al., 2003). In the United Kingdom, 34 cancer networks implement the NHS Cancer Plan, each typically serving a population of one to two million residents. Each network is a partnership among all the local organizations (statutory or voluntary) responsible for cancer care. These include Primary Care Trusts (PCTs), acute NHS Trusts and hospices. Importantly, networks bring together the people involved in planning and delivering care — clinicians, managers and patient representatives. The key role of the network is to plan and oversee delivery of cancer care, in line with national guidance (Griffith & Turner, 2004).

Various articles have evaluated the effectiveness of teams and their impact on patient outcomes. One UK study identified the need for a dedicated clerk to ensure smooth running of teams. That true national collaboration among MDTs is still developing (Kelly et al., 2003). A study of a random sample of the 72 breast cancer teams in the United Kingdom established that team composition, working methods and workloads are related to measures of effectiveness, including the quality of clinical care (Haward et al., 2003). Subsequent studies by this group reported improvements in processes and outcomes of care for colorectal (Morris, Haward, Gilthorpe, Craigs, & Forman, 2006) and breast cancer patients (Morris, Haward, Gilthorpe, Craigs, & Forman, 2008). A survey of colorectal cancer surgeons and colorectal clinical nurse specialists concluded that MDTs have very beneficial effects on patient care, training and morale. However, time for attendance at

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OECD, Olynyk reports an inter-disciplinary group consists of persons trained in different fields of knowledge (disciplines) with different concepts, methods and data, and terms organized into a common effort on a common problem with continuous intercommunication among the participants from the different disciplines.

MDTs was not taken sufficiently into account in terms of their job plans (Sharma, Sharp, Walker, & Monson, 2008).

Two systematic reviews conducted in the United Kingdom in 2006, prior to publication of some of the work described above, concluded there is still a lack of information to:

- support that MDTs either improve survival in breast cancer (Houssami & Sainsbury, 2006), or
- improve co-ordination, communication or decision-making between health care team members and patients — hopefully to produce more positive outcomes (Fleissig, Jenkins, Catt, & Fallowfield, 2006).

There is a need for more work in this area to assess the effectiveness of teams from a variety of perspectives, including patient, professional and system outcomes.

One US study described the process for implementing an interdisciplinary governance model in a comprehensive cancer centre, which led to a more effective work environment that promoted accountability, communication, respect and collaboration. Patients (as well as the system) benefited from shorter wait times in some areas and the substantial drop in the percentage of appointments with missing data. Collaborative efforts under the new model also resulted in an online medical record, improved reporting of laboratory results and improved patient access on holidays, weekends and evenings (P. R. Ponte, Gross, Winer, Connaughton, & Hassinger, 2007).

Using a multidisciplinary approach, together with nurse navigators, to manage lung cancer patients reduced waiting times from diagnosis to treatment — an average of 18.76 days, compared to an average of 29.3 days for similar patients, prior to implementation of the multidisciplinary approach. This approach also decreased the amount of patient dissatisfaction with a fragmented style of patient care (Seek & Hogle, 2007).

In CPAC's climate study of human resources issues, Wortsman and Janowitz highlight the importance of interdisciplinary teams whose broader implementation was found to be hampered by funding constraints, discipline-specific and physician-driven service delivery approaches and lack of flexibility as to how team members could best be deployed. The report calls for a national approach to develop human resources standards to complement the CPGs, and the need to share information and processes to review and evaluate programs (Wortsman & Janowitz, 2008).

6.3.3.3 CWSS respondents' views

"To get by with the human resources we currently have, we will need to re-organize the workload and practices of the medical oncologists and involve other health care providers to assume some of these responsibilities," said one CWSS respondent. Indeed, many health care providers and managers expressed the same need to look at effective collaborative and inter-professional teams to enhance the care provided with the resources available. Successful inter-professional teams are dependent upon the supply of team players available in the practice. Success factors identified by CWSS respondents included:

- ensuring infrastructure is in place
- ensuring mutual respect and trust
- ensuring support from clerical and administrative staff
- obtaining advice and input from all team members
- planning meetings into treatment schedules
- provision of time and space for a team to meet frequently as a "think tank."

Collaborative teams enhance the care provided to patients — diagnosis and treatment plans are discussed with a team of health care providers with varying expertise and knowledge, according to one CWSS respondent, a radiation oncologist. Further, in radiation oncology, colleagues support decisions, thus reducing the pressure of decision-making on one individual.

Some providers interviewed felt that while, conceptually, teams sound good, they are not completely implemented in a number of settings because of staff shortages. One nurse practitioner working in a large cancer centre indicated that the inter-professional collaborative team model is practiced there but that, at times, the approach is fragmented due to scheduling issues resulting in staff shortages. Yet, a number of CWSS participants stressed the need to seek better team collaboration and restructure team member roles to manage the increased demands in light of human resources shortages.

6.3.4 Emergence and development of new roles

New roles are emerging in response to many of the issues facing the cancer control workforce — these include the need to address shortages of highly-skilled professionals by optimizing the use of competencies, often as part of an inter-professional team, and through selective training to perform a specific skill set. Further, as work processes become increasingly integrated across the cancer control spectrum and

cancer control services are increasingly referred to the community, new roles are needed to provide the services. In short, pressures on the cancer control system are forcing the emergence of new roles and the blurring of existing ones as inter-professional teams increasingly provide care.

When discussing new and evolving roles, legislated scope of practice should be distinguished from employer-based or individual-based scope of practice. Legislative scope of practice is very clear. The scope of practice that employers and individuals define may differ. This can create confusion among jurisdictions in terms of what is accepted as part of the provider's role.

6.3.4.1 Evolving and new roles

Cancer Care Ontario (CCO) recognized that shortages in the number of specialized people threatened the provision of systemic therapy to cancer patients in the province. CCO, therefore, conducted a comprehensive review of roles, responsibilities and workloads of the health care professionals who are part of the systemic therapy team — medical oncologists, family physicians, nurses, pharmacists and pharmacy technicians (The Systemic Therapy Task Force, 2000). The proposed recommendations included the need to review the roles of team members in order to optimize the available competencies. For example, the recommendations called for expansion of the nursing role. This would include the introduction of nurse practitioners and other advanced practice nurses, and pharmacists providing more clinical services and delegating the technical component of chemotherapy therapy preparation to pharmacy technicians.

Follow up care of well patients, traditionally provided by oncology medical specialists, is contributing to their strenuous workload. A review of who can provide much of the care and consultations necessary for patient follow-up is needed to alleviate some of the workload pressures, so that the oncologists' attention can be focused on patients with more complex needs. Often, nurse practitioners or advanced practice nurses and general practitioners in oncology (GPOs) are identified as possibly taking on this role. Increasingly, the role falls onto general practitioners. This raises important challenges for both general practitioners in oncology and cancer specialists in the dissemination and uptake of new knowledge (E. Grunfeld, 2005).

The number of general practitioners in oncology practicing in Canada has increased in the last few years. One palliative care physician told the CWSS that family physicians/general practitioners are being asked to do far more than what they are trained to do in terms of supervising

chemotherapy therapy and pain and symptom management. A general practitioner in oncology that the CWSS consulted emphasized that the long-term trend for GPOs is more specialization, focusing on a specific type of cancer.

Many provinces are looking at patient navigators to relieve some of the responsibilities of the current health care providers in oncology and to improve co-ordination of care and services to patients and families. Cancer patient navigators are health professionals who work in consultation with patients, families, physicians and the cancer centres to ensure cancer patients' needs are addressed (Corporate Research Associates Inc., 2004). One CWSS focus group stressed that, "Patients need access to navigators to help with access to community resources and to find their way through the system."

One CWSS respondent, a patient advocate, discussed the advantages of employing patient navigators to assist patients and families through the system, indicating that there is a need for better co-ordination of services and provision of information to patients. Patient navigators provide emotional support for patients and families, prepare patients for their cancer journey, make referrals to appropriate health professionals, increase patients' and families' knowledge about cancer, help with co-ordinating appointments, make referrals to community supports, assist with the logistics of getting to cancer centres and find sources of funding for medications and supplies (Corporate Research Associates Inc., 2004).

Cancer Care Nova Scotia recognized early in its mandate the need for a Cancer Patient Navigator program. In 2002, it launched a pilot program in some of districts in Nova Scotia. The final evaluation report for the program confirmed the program's success in that it met its goals and provided strong evidence to implement the program in other provincial districts (Corporate Research Associates Inc., 2004). Patient navigators were seen as a source of information for health professionals, patients and families and as the linkage among the different components of the health and cancer system. Health professionals credited the program with enhancing the preparedness of patients, providing more support for patients, improving collaboration among health care providers, creating more efficient clinical involvement with patients and identifying service gaps. In summary, patient navigators greatly support the concept of patient-centred care.

Physics assistants/associates are being employed more frequently in cancer control — involved in maintaining the equipment and machinery. These employees typically possess a Bachelor of Science or Master of

Science degree in related fields, or are internationally educated health professionals with related qualifications.

One CWSS respondent identified the evolving role of dosimetrists as an occupation, in response to the impact of changing technologies and the increased complexity of treatment plans. With the advent of automation, computers calculate more and more of the treatment plans. There will continue to be a requirement for someone to input the necessary data and to ensure the proposed treatment plan meets the needs of the patient's care plan but the extent of the dosimetrist's role in this function is changing.

6.3.4.2 Advanced practice

Technological advances have evolved the role of the radiation therapist, according to CWSS respondents from the radiation team. One medical physicist manager indicated that there will be a blending of roles between radiation therapists and dosimetrists as radiation therapists become increasingly involved in treatment planning. One study identified a number of issues pertaining to advanced roles in radiation therapy. It concluded that there would be continued change in and expansion of the radiation therapy role over the next few years. "Therapists in Canadian centres are working in what might be deemed 'advanced' positions in an informal manner although there are currently no criteria defining specialist/advanced roles" (Bolderston, Summer 2005).

Some provinces, including Ontario, are investigating advanced practice or the creation of clinical specialist roles in radiation therapy. In other provinces (e.g., British Columbia), the approach is to fully assess the current role to better understand where and what enhancements to its role are needed. In 2004, the Ontario Ministry of Health and Long-Term Care provided funding to the Ontario Radiation Therapy Advanced Practice (ORTAP) to conduct a pilot project to field test seven advanced (Radiation Therapy) roles in Ontario and to investigate the value and feasibility of developing advanced practice roles in radiation therapy (Radiation Therapy Advanced Practice in Ontario, 2005). The impetus for this work stemmed from the Ontario government's need to look at innovative ways to alleviate the systemic pressures in the delivery of timely and effective radiation treatment. Currently, there is no designation for advance practice radiation therapists, although many therapists are performing advanced work, as one radiation therapist educator noted. Thus, the exact role of an advanced practice radiation therapist remains an unknown entity.

Recognizing the different and often confusing definitions used for advanced practice, ORTAP adopted its own definition to distinguish advanced practice from "expanded role" and "expert practitioner." Following the completion of the pilot tests of the seven advanced roles, in 2007 ORTAP received funding from the Ontario Ministry of Health and Long-Term Care for the Clinical Specialist Radiation Therapist (CSRT) Demonstration Project. This funding supports the implementation of five demonstration CSRT roles in Ontario.

6.3.4.3 Competencies

CWSS participants suggested that there is a need to review competencies of current team members and re-allocate follow-up care responsibilities among appropriate team members such as nurse practitioners, advanced practice nurses, physician assistants, general practitioners in oncology and general practitioners. The *Systemic Therapy* report also proposes integrating clinical associates or general practitioners in oncology into the systemic therapy team to enhance the care provided and alleviate some of the workload issues (The Systemic Therapy Task Force, 2000).

The scope of the nursing clinical role functions in cancer control the RNs perform — from prevention to palliation at the specialized and advanced levels of practice — was examined in ambulatory centres in Ontario (Crooks & Green). Although a report is not yet available, the study will help inform human resources planning needs. These include changes to education curricula by identifying the clinical role functions performed by RNs, the functions considered to be within the scope of practice of each level, the role functions referred to other practitioners and the roles that should be considered to fall within the two levels of practice identified. The Canadian Association of Radiation Oncologists (CARO) also drafted a paper to define what the scope of practice should be within the specialty of radiation oncology, given the implications of significant changes on the profession (Canadian Association of Radiation Oncologists, 2005a). Considering the RCPSC Office of Education's definition of radiation oncologists, CARO provides a definition of current practice of radiation oncology and uses this to identify the high priority areas to inform the discussion of scope of practice policy.

6.3.5 Process design/mapping for development of effective service delivery

Several CWSS respondents noted the importance of involving their teams in a regular review of processes to improve efficiency, maintain or improve quality and improve patient outcomes. As treatment advances continue, the relationship between teams is blurring. Radiation therapy may now precede surgery — or imaging of the tumour

through radiologic methods may guide surgery — or pathology must communicate detailed information to ensure treatment is personalized to an individual patient's tumour.

According to one CWSS respondent:

> "An industrial engineering approach using process improvement techniques may be more effective. For example, human resources can be used more effectively by integrating scheduling and information for planning care."

A focus group had this perspective:

> "Most things we do in health care have evolved over time and were not designed purposively, so we have inherited systems that may not meet current need. We need to build work processes that consider people skills and workflow."

Applying the principles of process re-engineering to cancer care has been vital to the second arm of the UK National Cancer Plan, the Cancer Services Collaborative (CSC) program. Working at the level of an individual MDT or service area, the CSC aims to reduce wait times and improve patient experience by streamlining services in two key ways: process mapping, and capacity and demand analysis. Process mapping details all the steps in a patient's care pathway to identify and overcome the bottlenecks. Capacity and demand analysis scrutinizes the flow of patients through a department and the available capacity (people, machines, etc.) to deal with demand. Through this process, implementation of multiple, relatively small changes has had considerable impact on patients' experience of care. For example, in one centre, it improved waiting times to complete the patient's pre-admission assessment on the same day as the outpatient visit to decide on when to book the surgery (Griffith & Turner, 2004).

An extension of this approach is presented in a recent Canadian article. Hiple et al argue that planning in the service sector (including health care) must move forward in five ways, from:

- a systems to a "system of systems (SOS)" approach
- a disciplinary to a multidisciplinary outlook
- a mass production to a mass customization focus
- a steady-state to real-time perspective
- an optimal to an adaptive approach.

Notably, these approaches have the potential to be applied to cancer care planning in that there is increasing integration of cancer care systems across the cancer control spectrum and within mainstream

health care systems, multidisciplinary teams are being created, treatments are becoming more personalized (customized) to the patient and treatments must be constantly adapting to new research findings and technology. According to these authors, customization is as both an enabler and a driver for service innovations. The nine enablers, all of which are in play in Canada's cancer control system, are:

- automation
- collaboration
- customization
- decision informatics
- globalization
- organization
- software algorithms
- standardization
- telecommunication.

Four of these enablers — collaboration, customization, integration and adaptation — are directed at empowering the individual and are highly relevant to cancer control (Hipel, Jamshidi, Tien, & White, 2007).

With the system of systems approach, systems design (which goes beyond the computer aspects) will be based on principles that:

- involve all stakeholders (including patients and families)
- recognize uncertainty
- require an integrative and adaptive approach to the multidisciplinary nature of the problem
- produce good decisions.

Systems should be structured to consider the manner in which the model output or information is provided to the decision-maker. Systems integration must ensure that:

- Each system can communicate and interact with the entire SOS without any compatibility issues (with obvious applicability to health care).
- There is seamless interaction among the components.
- There is effective implementation and analysis of large complex, inter-dependent and heterogeneous systems working in a co-operative manner.

In summary, this approach uses a data/information/knowledge/wisdom framework to support (in sequence) operational, tactical, strategic and systemic decisions.

Strategic decision-making can be distinguished from tactical and operational decision-making by its organizational and financial impact, the "clock-speed" and the scope (i.e., the need to involve political, legal, social and ethical factors) (Hipel et al., 2007). Clearly, this approach touches on many aspects of process mapping that are critical to re-engineering a system as complex as the myriad of delivery mechanisms in Canada's cancer control programs.

6.4 Summary of Challenges

CWSS respondents reported a number of challenges to finding ways to improve how they deliver programs. Factors to consider in designing service delivery models include the model's ability to provide population-based, patient-centred care that meets patient and family needs — while simultaneously optimizing inputs including human and financial resources, technology, information systems, process mapping, quality assurance and cost-effectiveness. Human resources planning must further consider:

- the impact of shortages
- how best to optimize the available competencies and skill sets in a given locale, which may require taking a team approach
- requirements of regulatory bodies, collective agreements and certification when proposing new or expanded roles
- training needs
- human/process interfaces with the implementation of new equipment, drugs or procedures
- necessary inter-professional education and other infrastructure for team development and on-going operations.

With shortages in many key occupations, program implementation may have to rely on developing new roles (such as advanced practice nurses, pharmacy technicians or physics assistants) to keep up with the workload and meet wait time guarantees. Service delivery models need to be flexible to account for implementation in small centres where the absence of one family physician or one nurse can wreak havoc on providing patient care. Even in a larger centre, a few people in a key area booking off sick results in the cancellation and rebooking of patient appointments. As one CWSS respondent put it:

> "One size does not fit all: different communities have different needs to consider (e.g., Toronto [cancer centres, quaternary care available] to Thunder Bay [regional cancer centre] to Moosonnee [remote community])."

CWSS respondents often identified the lack of physical space as an issue that creates communication problems and leads to inefficient use of time. The physical location of some cancer centres is fragmented. Services are in a number of locations. In most cases, the CWSS respondents recognized that it was only a matter of time until the building of additional space or a new centre. However, even in a relatively new centre, one team reported having a lack of space to see patients.

> "With the lack of space to see patients, nurses are fighting over rooms and physicians are kept waiting."

Some health care providers consulted for the scoping study did not feel they were operating to their optimal competencies. One nurse practitioner commented that she was not given the authority to issue medical directives and prescriptions and was limited in her permitted diagnostic work. The *Survey of Oncology Advanced Practice Nurses in Ontario: Profile and Predictors of Job Satisfaction* examines the role of structures and their impact on job satisfaction for oncology advanced practice nurses in Ontario. Overall, advanced practice nurses were minimally satisfied with their roles. The study recommends the necessity of improving role development and expanding their role in the delivery of oncology services (Bryant–Lukosius et al., 2007).

Some CWSS respondents saw attitudes and cultural issues, together with the traditional medical hierarchy, as impeding the ability to move forward. Entrenched views on what a nurse, a woman or a doctor is "supposed to do," can get in the way of finding new ways to organize the work. CWSS respondents noted that, while some workers are threatened by change (and doing things differently), others embrace it.

The attitudes of other health care providers and the public can affect the ability to work to full scope of practice. According to one nurse practitioner, some patients still prefer to see a physician than another team member. Another nurse practitioner noted that there is still an attitude that the physician needs to see the patients when, in fact, this may not be necessary. However, these attitudes may change over time, given that the rising volume of patients will make it necessary to delegate some responsibilities.

Many CWSS participants confirmed reports retrieved from the literature that stress the urgent need to review the current roles in cancer control to assess whether there is optimal and efficient use of competencies.

Some respondents recommended undertaking a review and streamlining of current roles to determine the optimum use of the available competencies. Further, there is a need to create standards for the different roles. Standards will add to health care providers' knowledge about the responsibilities of other team members.

Optimizing the use of competencies of potential team members must consider the patchwork quilt of formal education that team members may have, depending upon when their education took place, which province they graduated from, and the extent of their in-service training since graduation. A maze of requirements at the provincial or national level, involving governments, academia and professional organizations, regulate and certify most (but not all) cancer care providers. Chapter 4 of this report discusses this.

There may be a need for on-the-job training to educate team members about new equipment or processes. However, staff schedules, the need to balance program implementation with wait time guarantees and the lack of dedicated time of experienced staff to train new hires may limit the ability to provide training.

Remuneration models also constrain the design of service delivery approaches as physician reimbursement may be on a fee-for-service or salary basis. This affects costs and budgets for attending training sessions or introducing new team members, such as nurse practitioners who cannot directly bill for patient care. Physician fee codes often do not cover all the costs and time need to deliver complex cancer care in the community.

One CWSS physician respondent suggested launching multi-site studies. These would examine access to care, what services health care workers are providing, assess the time spent on the various activities and identify activities that need to have time spent on them. These studies should be co-ordinated provincially and, possibly, nationally. The results will assist in improving human resources planning and provide data and information to feed into forecasting models. Tied to this is the need to review remuneration structures, employment contracts and also liability and malpractice issues.

Chapter 7 Summary of Findings With Recommendations

The goal of the CWSS is to complete a pan-Canadian situational analysis of the cancer control workforce and to provide information and recommendations that will guide the development of a strategy for human resources in cancer control. The results in this report aim to generate and inform further discussions by decision- and policy-makers with the goal of ensuring that patients and their families receive the right care by the right provider at the right time — and that a healthy, appropriately trained and sustainable workforce is available to deliver quality, patient-centred care.

This chapter synthesizes the trends and challenges that the CWSS identified and that are the basis for the proposed recommendations. It then outlines the short- and long- term recommendations based on contributions from the respondents to the CWSS, and subsequently proposed by the project's Joint Steering Committee. Together, these recommendations respond to the issues and challenges identified in three overarching themes:

- effective planning, management and co-ordination of health human resources
- planning for a sustainable cancer control workforce
- adapting and developing approaches to service delivery to optimize the time and talent of Canada's cancer control workforce.

7.1 Overview of Current Status

Cancer control, together with the health care system at large, is under considerable stress. Workers providing cancer care are struggling to meet wait time challenges, continuously learn new treatments and technologies, work and consult with much more knowledgeable and demanding patients and families, manage an escalating workload and, ultimately, provide the best possible care to patients and their families — all this with a workforce that is coping with shortages in most occupations. Indeed, many CWSS respondents expressed concern about their ability to continue to keep on working in this environment.

The CWSS documents various factors related to supply and demand that are contributing to the shortages facing the cancer control workforce. Increased demand for the highly skilled cancer control workforce is the result of the relentless rise in the numbers of both incident and follow-up patients who requiring care, and the need to train for, implement,

and deliver the new and often more complex treatment protocols. There are decreases in the effective supply of workers due to the needs of many health professionals to cut back on the numerous overtime hours they work under stressful circumstances —motivated by the desire for a better work-life balance and protected time for critical non-clinical activities.

A multi-pronged approach is needed to improve the supply of the cancer control workforce, addressing four key areas:

- Increase the intake of education programs and provide effective on-the-job training to build up key skills sets.
- Find new ways to deliver cancer services that optimize the use of human and other resources — for example, using inter-professional teams to deliver patient-centred care.
- Develop and implement employment strategies to recruit and retain workers through a combination of policies for inventive remuneration structures, use of international graduates and the creation of healthy workplaces.
- Provide for a sustainable workforce through effective planning, management and co-ordination of health human resources.

Decision-makers know the pressures on the cancer system. They have taken action to deal with some immediate challenges:

- Academia is working towards producing more graduates and providing continuing professional development opportunities.
- Employers are using new retention and recruitment strategies. These include innovative remuneration packages to attract new providers and retain existing workers, and continued international recruiting. However, there is a lack of understanding about the extent of international graduate recruitment in cancer control and a growing recognition of Canada’s responsibility to educate its own health workforce.
- Managers and employers are seeking to optimize the use of workers through effective approaches to service delivery, including creating new roles for current health care providers.
- Policy- and decision-makers are recognizing the need to sustain effective overall management of the cancer control workforce through effective policy development and implementation at the program or facility level and in the broader pan-Canadian arena.

Addressing the imminent shortages has been the focus of governments, employers and managers to ensure the delivery of quality care to Canadians. This action has been a priority but attention must be given

to ensuring that cancer control continues to meet and provide the quality care patients and their families deserve, regardless of their location. This means planning for:

- the right number of health care providers who have the skills and knowledge to deliver the care
- the necessary technology and equipment
- the ideal cancer control environment — in a cancer or community centre, a primary health care team or even in a virtual environment to reach out to patients in more remote and rural regions of Canada.

7.2 Trends and Challenges in The Cancer Control Environment

7.2.1 Limited knowledge about the cancer control workforce

Data gaps challenged the CWSS's ability to document the total number of health care providers who deliver cancer control services. For many occupations that the CWSS studied, there is limited available information on the numbers employed, with even less known about what cancer care services the provider delivers to patients.

The trend by both male and female physicians to reduce their average number of hours worked weekly contributes to a decrease in the effective supply of physicians. The impact of upcoming retirements due to the aging workforce is also a concern for most of the cancer control occupations in the CWSS.

The lack of published human resources data and analysis for the sector greatly restricts Canada's ability to plan to meet the goal of a sustainable cancer control workforce.

7.2.2 Cancer trends

The reported number of new cancers has more than tripled over the past four decades to an estimated 171,000 in 2009, due to population growth and aging. New cases are not the only factor driving demand for Canada's cancer control workforce. Treatment advances and other interventions leading to lower mortality rates are leading to more and more patients living longer and requiring care for cancer. Treatments themselves are becoming more complex. They require more interaction with personnel working in other phases of the cancer control continuum. Finally, patient expectations are increasing. Health providers need more time to respond to questions and discuss treatment alternatives with patients who have access to considerable information on the Internet.

7.2.3 Quality of work and the need for work-life balance

Generational changes in attitudes to work-life balance are greatly affecting the supply of health care providers working in cancer control. Family medicine and specialist physicians are reducing their average weekly hours worked. Further, many highly skilled health professionals who make up the cancer control workforce want protected time for non-clinical activities. Reducing the weekly hours worked and providing protected time means fewer available hours each week for clinical care. This leads to a greater demand for health care providers. Documentation and anecdotal evidence indicates that cancer control workers try to fill the gap between supply and demand by working longer (paid and unpaid) hours. This is not sustainable — ultimately, this leads to burnout and its negative consequences for individuals and for organizations.

Highly skilled health professionals, including new graduates, want work-life balance and protected time as part of their remuneration packages to ensure satisfying career opportunities and an overall better quality of life and work. Some workers are looking for part-time hours or flexible work arrangements.

7.2.4 Changing work environment

New technologies, equipment and systemic therapies are arriving in the workplace at a rapid pace. This places more pressure on the system to develop, implement and maintain appropriate programs. Innovation in technology has enhanced the provision of care and improved patient outcomes but it has also increased the workload and time demands placed on health care providers. At the same time, innovations create pressures on an already strained system to provide education and training. For example, faced with a choice on either to implement new radiation equipment or meet wait time guarantees with the existing equipment, one centre chose to delay implementation of the new equipment.

Expert information systems can enhance communication among the large team of care providers for each patient. Combined with telehealth, these are playing a critical role in the delivery of diagnostic programs and systemic therapy to remote and rural communities. With funding from the Canada Health Infoway, many health regions and hospitals across Canada are upgrading their paper-based health records into the electronic health record (EHR). This is expected to reduce retrieval and storage costs and reduce the duplication of expensive laboratory tests. Continued enhancements to information systems and to automation in the workplace are expected to improve efficiencies in

process and administration — but appropriate training, and time for training, are essential to minimize workers' stress and frustration levels. Ideally, as several reports in the literature emphasize, EHR design and implementation should involve all stakeholders. This will ensure systems meet user needs, including the integration of EHR data with the currently existing cancer registry and other data sets.

The increased complexity of treatments is also driving the demand for the cancer control workforce. These treatment advances are leading to better patient outcomes but they may be delivered over longer time spans. Staff need time for training in the new treatments and for planning their effective implementation. The combination of the increased prevalence of patients requiring ongoing follow-up and survivorship care and the multiplier-effect of treatment advances are adding to the increasing numbers of new cases.

7.2.5 Supply and demand

The supply of health care providers, including those in cancer control, is an international concern due to the widespread shortages for highly qualified providers. Workload ratios or human resources planning standards are needed — particularly for pathologists, radiation oncologists, medical oncologists and medical physicists. There are regional variations in the percentage of patients receiving radiation therapy in Canada. Therefore, radiation oncologists, in particular, need a greater understanding of the benchmark percentage of cancer patients who should be receiving treatment.

Statistical models to forecast demand and supply have been developed in Canada but more work is needed to ensure that these models provide adequate coverage of the cancer control workforce. Having the ability to forecast future demand is particularly critical for the smaller occupational groups that are crucial to deliver cancer care. These include pathologists, radiation oncologists, medical physicists, radiation therapists and medical oncologists, where special approaches may be needed. The Cancer Workforce Planning Tool (CWPT) is one statistical modelling approach. When fully developed, it will provide valid, dynamic data for planning by bringing together supply and demand side information and information on radiation therapy equipment to determine workload projections, productivity norms, human resources plans, training and residency plans.

7.2.6 Funding

The continued need for funding underlies most of the challenges and issues in cancer control. Understanding the true costs of providing cancer care is essential to manage budgets and enable funding formulas to truly capture the expenses, including all the supportive care functions. Recognizing the true costs for complex treatments is needed for effective planning. It should be considered in funding and reimbursement models. Funding formulas need regular review. Some program managers are working with budgets that do not take into consideration recent increases in care complexity and costs.

More funding is essential to meet the demands to produce health care providers in cancer control over the next few years. Rising health care costs across the country and internationally have fostered a competitive environment. There are many competing demands for limited health care dollars and health care professionals. Cancer control competes with numerous other critical health care needs that provincial/territorial governments must consider. Budgets are often insufficient to cover all the training costs (such as staff time) or for acting assignments that are necessary for staff development.

Purchases of new equipment and technologies often require lengthy approval periods, partly due to their high cost. Alternative strategies such as the use of a multi-year capital funding pool would be helpful. The issue is further exacerbated by how quickly some technologies become obsolete due to the rapid pace of technological changes. CWSS respondents regularly pointed out that government is not keeping pace with the rate of change in technology. This has implications for planning in many centres. Delays in purchasing necessary equipment, adjustments to current plans and ongoing revisions to longer-term financial plans all add pressure to maintain or reduce lengthy wait times.

7.3 Recommendations

The CWSS proposes eight recommendations. These reflect input from both consultation participants and the steering committee. The recommendations are grouped within the three overarching themes of effective planning, management and co-ordination of health human resources, planning for a sustainable cancer control workforce and adapting and developing approaches to service delivery to optimize the time and talent of Canada’s cancer control workforce.

7.3.1 Effective planning, management and co-ordination of health human resources

Canada's health human resources labour pool, while currently managed largely at the provincial level, is mobile both inter-provincially and internationally. Some key cancer control workforce occupations employ a relatively small number of people. If only a few people leave, it can have a debilitating impact on a community's or a region's access to, and wait times for, cancer care.

Recommendations #1 and #2 propose the development of a centralized analytic capacity to address workforce issues and a human resources strategic action plan.

Recommendation 1: Co-ordinate a pan-Canadian approach to cancer control workforce planning

The cancer control community should implement a co-ordinated, pan-Canadian approach to educate, train, recruit and retain a sufficient number of cancer control providers who can meet the increasing demands for cancer care, new technologies, treatment advances and new approaches to service delivery.

- A pan-Canadian approach should include support for an infrastructure to co-ordinate the ongoing study, monitoring and public reporting of health human resources needs for cancer care across the country.
- Governments, medical schools and professional organizations need to work together to ensure adequate policies are in place for a healthy and sustainable cancer control workforce. They must continue to collaborate and develop new ways to organize care and improve the continuity of care for patients by forging links across the health care system. Greater systemic collaboration at a pan-Canadian level is needed to address the new, emerging and growing demands of caring for patients in today's health care environment and to assure effective and efficient delivery of cancer care services.

Long-Term Planning Is Key

Increasing the supply of workers alone will not address all the health human resources challenges. Members of the cancer control workforce must have the opportunity to participate in finding innovative and creative solutions to achieve efficiencies and improve patient outcomes. This includes analyzing service delivery practices and

understanding the need for services, and then determining education, and retention and recruitment strategies.

The recent report, *Taking the Next Step: Options and Support for a Pan-Canadian, Multi-Professional HHR Planning Mechanism,*[26] proposes a national co-ordinated approach to planning. It states: "[co-ordination at a pan-Canadian level is essential] to take into account changes that are occurring elsewhere in the system both at the level of health human resources planning and in terms of non-health human resources changes in the organization and delivery of services."

The summary report of the 2007 National Physician Survey findings also calls for a co-ordinated, pan-Canadian approach to educate, train, recruit and retain a sufficient number of physicians to meet the needs of an aging population with increasingly complex health problems (which include cancer).

Participants who were consulted during the CWSS strongly supported its pan-Canadian premise. Health care provider and manager interviewees said the lack of pro-active planning for human resources leads to frustration and pressures when the necessary staff are unavailable to meet increased service demands.

Planning for the future can be very difficult. Often, plans are tied to receiving scarce funding from hospitals or provincial governments. Better planning means:

- letting managers know what their funding will be over an extended time period (e.g., up to five years) so they can plan accordingly — for example, being able to hire and/or train new people to meet patient needs
- knowing the current and future availability of health care specialists and their needs.

Effective long-term planning at every level of management will achieve long-term goals and positively affect worker satisfaction.

Managing Workloads

A key challenge to cancer control workforce planning is how to manage workloads. This is essential in order to provide quality, compassionate care within guaranteed wait times for the ever-increasing number of cancer patients. A first step is setting workload ratios or human

26 T. McIntosh, Torgerson, & Wortsman, 2007

resources planning standards (or guidelines), especially for pathologists, radiation oncologists, medical oncologists and medical physicists.

With experience, these ratios and standards can be adjusted to take into consideration the inter-professional teams that work with them in delivering services to patients. For the radiation oncology team, in particular, there is a need for a greater understanding about the appropriate percentage of cancer patients who should receive treatment. There is some evidence to support that radiation therapy team workloads would be even higher if all patients who could benefit from radiotherapy actually received treatment.

Managers face workload challenges, particularly with time-consuming administrative tasks. Most managers have both administrative and clinical roles. Some CWSS participants suggested that support staff could take on additional administrative activities. This would give managers more time to spend on leadership-related responsibilities. Others noted that managers' increased workload is due to their lack of management and leadership experience — leading to a longer learning curve.

CWSS participants said that there is a need for specific management training and career development opportunities to develop people for management positions. With impending retirements anticipated in the medium- and long-term, succession planning and strategies to retain corporate knowledge should be considered. One suggestion for addressing the looming retirement bulge was to create communities of practitioners *emeriti* (i.e., retirees willing to participate on their own terms). This is a strategy that organizations in other sectors, facing similar challenges, are using to keep corporate knowledge and transfer it to new employees and to employees who are progressing within their organization.

Recommendation 2: Develop a human resources strategic action plan for cancer control

The CWSS has generated useful information. Stakeholder groups in cancer control and across Canada's health care system can use the information to collaborate and develop a strategic action plan for human resources in cancer control. This action plan should identify:

- short-, medium- and long-term actions
- the stakeholder groups who should participate in implementing these actions

- areas for further research to provide the information and directions for action.

Many CWSS participants called for national co-ordination of planning, research and data collection efforts. They said they would welcome a centralized analytic capacity to address workforce issues.

7.3.2 Planning for a sustainable cancer control workforce

Effective planning, management and co-ordination of health human resources include the need to plan for a sustainable workforce. This requires understanding:

- the current and future demands of Canadians
- the supply of health care providers
- the needs of the existing workforce
- innovations in technology
- new ways to deliver care.

Each organization is responsible for its own planning. At a high level, provincial and territorial governments — with the collaboration of provincial and territorial health care organizations — carry out human resources planning. This planning focuses on the needs of the health workforce as a whole. Seldom is there addressing of the specific concerns of the cancer control workforce. Recommendations #3 and #4 will help in the development of a sustainable cancer control workforce by strengthening collaboration and broad-concept thinking.

Recommendation 3: Forge networks to promote collaboration among all stakeholder groups to enhance human resources planning, starting with a knowledge/information exchange forum for stakeholder groups and a network to build research capacity.

A network approach is familiar to many areas of the cancer world, from the success of the Canadian Council of Cancer Registries in building the Canadian Cancer Registry, the Canadian Breast Screening Initiative and the networks of palliative care researchers that the Canadian Institute for Human Resources (CIHR) funds.

Collaborative projects will help to break down provincial reticence to share knowledge and information relevant to human resources. A network of researchers working on human resources issues is already in place for nursing. A pan-Canadian network of planners, cancer epidemiologists, clinicians and health services researchers is needed to

increase the level of trust and encourage information sharing to find solutions to their common challenges for the cancer care workforce.

CAPCA and CPAC can be agents to consolidate information and help provinces. CPAC action groups and CAPCA policy advisory committees are establishing connections, across cancer agencies, that affect human resources issues. Networks will also help provide opportunities to find colleagues in other areas (e.g., health ministries, other cancer control facilities). Several CWSS participants said federally funded meetings that bring colleagues together are very useful. Collaboration among all stakeholder groups in cancer control and in health care overall will promote idea and information exchange. These kinds of co-operative and collaborative efforts can identify and conduct projects of common interest. This will reduce duplication and help human resources planning across Canada.

Existing organizations like CAPCA and CPAC should be supported and used for this purpose. While provincial and territorial stakeholder group collaboration is necessary, national level partnerships are equally important in bringing a co-ordinated approach to planning. This will meet the needs of diverse stakeholders and provinces, both large and small.

Recommendation 3.1: Create a forum for stakeholder groups, including governments, to collaborate and exchange knowledge and ideas on educational needs, issues and challenges.

This kind of forum will provide the venue to plan for the appropriate supply of health care providers that Canada greatly needs. The issues it should deal with include:

- considering the current and future supply of faculty
- putting strategies and actions in place to address the anticipated potential shortfalls
- addressing the issue of clinical placement experiences and the declining supply of preceptors
- finding solutions that include innovative technologies to expand clinical practice experiences
- examining preceptors' remuneration.

Some of the other issues the forum can take on are:

- determining how to promote and support the integration of Inter-Professional Education (IPE) into health workforce educational programs

- determining enablers and barriers of effective IPE integration into current educational programs
- reviewing and discussing residency position funding, control and access to ensure the availability of an appropriate number of spaces for specialized cancer professions
- creating linkages between educational institutions using new e-learning technologies to deliver distance learning programs for rural and remote regions
- collecting consistent information on faculty members such as retirement projections and demographic information (e.g., age, gender)
- exploring innovative remuneration structures for faculty and building case examples
- investigating clinical placement costs in all disciplines by systematically tracking direct and indirect budget line costs, intangible costs and tangible and intangible benefits to ensure hands-on apprenticeships/mentored clinical practice
- identifying leading practices in "just-in-time" curriculum development to respond to ongoing technological change and documenting methods, enablers and challenges (as in other sectors)
- providing ongoing continuing education courses for health care providers working in cancer control, including the faculty delivering the education.

Recommendation 3.2: Build research capacity by creating a network of researchers, data analysts and program planners to work towards addressing the data gaps, and continue to share knowledge and approaches to common problems.

Developing data, tools and networks is necessary to support planning for a sustainable cancer control workforce. The *Cancer Workforce Scoping Study* identified gaps in the human resources research data and information.

Some data do exist but, in many cases, there is a need for linking and analysis of data sets to increase their usefulness for cancer control workforce planning. Considerable potential exists to mine cancer control workforce data that are already available, including data compiled in national data bases (and corresponding provincial data sets) maintained by organizations such as the Canadian Institute for Health Information, Statistics Canada and larger professional organizations. In addition, some data collected by smaller professional associations have limited dissemination to the broader public.

Gaps in — and the limited availability of — data make it challenging to document the total number of people providing cancer control services. The 82 occupations that the CWSS looked at are in all phases of the cancer control continuum. Data are very limited on how many people work in some occupations. For others (e.g., physicians and nurses), little is known about how much of their time they spend on cancer care.

The CWSS analysis reveals that cancer care accounts for about 70 to 80 per cent of the workload for palliative care physicians and pathologists. It can be assumed that most or all of the care that radiation oncologists, medical physicists, radiation therapists, medical oncologists and surgical oncologists provide is for cancer patients. However, little is known about what services the registered nurses, nurse practitioners and family physicians occupations, as a whole, provide and how much of their workload is directed to cancer patients. The recent National Physician Survey results, and other studies, are starting to shed light on this issue.

Recent trends indicate an increase in the proportion of nurses and physicians per 1,000 population in the workforce, although this trend has fluctuated over the years. The fluctuations, stemming in part from budget cutbacks in the early- to mid-1990s, have contributed to today's cancer control workforce shortages. Further, the trend to decreases in the average number of hours that both male and female physicians work weekly, equates to a reduction in the effective supply of physicians. The impact of upcoming retirements is also a concern for most of the 82 cancer control occupations in the study.

Given all of the above, participants identified the need for a cancer control workforce information strategy. This should be part of an overall cancer information strategy to effectively incorporate data available from the electronic health record. Better integration and linkage of clinical and administrative data sets will help in understanding cancer care delivery to populations. A thorough analysis of existing data sets will lead to the development of recommendations on what information the enhancing of existing data sets could provide, and what topics would need new data collection. Stakeholders involved in these activities should include regulators and licensing bodies that may also do data collection.

The CWSS identified the following areas for data development and analysis:

- demographic and trend data pertaining to the cancer control workforce

- integrated and linked data sets
- knowledge of the services provided to patients by the cancer control workforce
- a dynamic population-health-based HR planning system
- population-based understanding of utilization rates and workload ratios
- the health and quality of life of the cancer control workforce.

Recommendation 4: Develop and implement strategies to retain and recruit health care providers in cancer control.

Generational changes in attitudes to work-life balance are having a significant effect on the supply of health care providers delivering cancer control. Family medicine and specialist physicians are reducing their average weekly hours worked. In other occupations, workers report attempting to fill the gap between the increasing workload demands and what they can supply by working both paid and unpaid overtime, working through coffee and lunch breaks and/or cutting back on vacation time. However, several key reports document that working longer hours can be counterproductive. This practice can lead to job dissatisfaction, burnout, increased absence due to illness and a potential for more errors that put patient safety at risk.

Highly skilled health professionals want protected time for non-clinical activities. These include research, teaching responsibilities, continuing medical/professional education, management and administration. Many CWSS participants said that clinical demands have increased so much that cancer care providers are challenged to fit in all of these required tasks. Clearly, any reduction in time spent on clinical activities will contribute to a greater demand for health care providers.

High staff turnover in some occupations is a problem, particularly for medium- and smaller-sized centres. This is due, in part, to the increasingly greater workloads. These, in turn, create job stress, burnout and, ultimately, an unhealthy workplace culture. For organizations and individuals, burnout has serious consequences. At the organizational level, it results in absenteeism, high turnover rates and reduced productivity. At the individual level, burnout contributes to psychological and physical health problems.

There is a need for more information, specific to the cancer control workforce, to understand work issues like turnover rates, absenteeism, stress and job satisfaction. This will help employers to develop and roll out appropriate strategies to retain workers. In addition, strategies

should be developed to promote residents continuing to work in the same location and environment, after their licensure or certification.

Jurisdictions are implementing retention strategies to keep the much-needed health care workforce in their regions. Such strategies include bursary programs, retraining initiatives, return-of-service agreements, reducing workload and physical demands, improving the workplace environment, enhancing roles, providing continued education and professional development opportunities, developing collaborative practices and increasing salary and benefits. Many regions in Canada are educating and training "their own" health care providers with the hope that some of these providers remain in the region, post-graduation.

Recruitment is particularly difficult in oncology because of its association with high stress levels, toxic agents, complex research protocols — and the fact that many patients die. Most current cancer control recruitment is traditional, using methods such as word-of-mouth, advertisements in local, provincial/territorial and national newspapers and on association websites. There is a need for more innovative strategies to compete for scarce human resources with inter- and intra-provincial recruiting of cancer control health providers, with other sectors of health care in Canada, and globally. This involves offering incentives that reflect the desires and needs of the new generation of workers, addressing, in particular, work and personal life balance and the inclusion of protected time for continuing professional development, research and other work activities. Traditional incentives are not as appealing to the new generation of workers.

Many managers have resorted over the years to recruiting from abroad. Recruiting Internationally Educated Health Professionals (IEHPs) adds to managers' workloads and time demands, given the amount of time, effort and paperwork from the first contact to full integration of the IEHP into the workforce in Canada. Furthermore, there is no guarantee that the IEHP will stay in that location — or in Canada.

7.3.3 Adapting and developing approaches to service delivery to optimize the time and talent of Canada's cancer control workforce

The need to adapt and develop approaches to service delivery and to optimize the skills of the cancer control workforce is part of human resources planning. Stakeholders in health care and cancer control are exploring innovative approaches to delivering optimal service and care in light of inadequate human resources and ever-increasing health costs. More work is needed to fully assess and document best practices across the country, and perhaps internationally. Recommendations #5 to #8 propose ways to address the need to enhance the care and service that

patients and families receive and make the most of the available cancer control human resources.

Recommendation 5: Develop program implementation models and human resources planning standards and guidelines that ensure the care is appropriately and safely delivered.

The ultimate goal of cancer control programs is improving patient outcomes, whether to prevent the development of cancer, reduce mortality from cancer or improve the quality of life of those living with cancer. These programs are ideally implemented within a health system that uses a population-health approach to balance investments in prevention, screening and effective treatments. The availability of evidence-based clinical practice guidelines (CPGs) may be seen as the first critical step to guide planning of cancer control programs. For example, evidence-based CPGs focus on the best treatment for the tumour while more work is needed to determine how best to deliver the service to a given population. There is a need to build on CPGs to develop program implementation models and human resources planning standards that ensure appropriate and safe delivery of care.

The CWSS found that cancer care service delivery approaches are in transition. Many natural experiments are taking place across the country to develop more effective ways to deliver care. While the consensus on models of care is that “one size does not fit all,” managers are working creatively within resource constraints to adapt existing models or develop new ones to deliver effective services to their patient populations.

More discussion and collaboration among the cancer control stakeholder groups is necessary to identify the current planning assumptions. These will need to be adjusted over time, as service delivery roles and models evolve. These planning assumptions are integral to guiding the decision-making and actions roll out that will ensure a sustainable cancer control workforce.

Recommendation 6: Document leading practices to demonstrate the effectiveness of innovative approaches to service delivery and provide working models to show how these may be effectively integrated into the cancer control system, recognizing that larger and smaller centres may have different needs.

Stakeholder groups in health care and cancer control are exploring innovative approaches to delivering optimal service and care in light of scarce human resources and ever-increasing health costs. Further work

is required to fully assess and document leading practices, across the country and internationally.

The CWSS identified three current models that could be used and/or developed to make the most of the available cancer control competencies. These models illustrate what can be expected with new and emerging roles in cancer control.

The Primary Care Model — The ongoing and gradual implementation of the primary health care model that is occurring throughout Canada has important implications in co-ordinating care for cancer patients across the cancer control continuum. The primary health care model is developed from population health principles. It provides patient-centred care through inter-professional teams. This model is particularly important for prevention, screening, rehabilitation, supportive and follow-up care, and community and home-based palliative care. An important ongoing concern is to ensure that cancer control programs are effectively integrated into primary care and to document the challenges family physicians face in delivering cancer control programs.

Diagnostic Centres — A second innovative model is the move towards establishing diagnostic centres to reduce wait times for patients by providing "one-stop shopping" for all diagnostic tests. The time period for diagnosis can be very stressful to the patient and family, with referrals from one test to another. Wait times add up quickly. Telehealth provides opportunities for mentoring and quality control by linking smaller centres to larger ones. There is a need for good case studies and evaluations to demonstrate the effectiveness of the diagnostic centre model and how to effectively integrate it into the cancer control system in both large and small communities.

Community Networks — A third model is the increasing development of networks and the capacity to deliver systemic therapy for curative and palliative care in communities closer to the patient's home. Both patients and care providers enthusiastically support these community networks. They are based on a patient-centred approach that involves inter-professional teams, and require a commitment from the central hub located in a regional cancer centre or provincial cancer agency. The hub provides specialist support, training and co-ordination.

The implementation of this model depends on effective telehealth and some form of an electronic health record. CWSS participants had concerns about shortages of family physicians, nurses and pharmacists, although pharmacy technicians are being used to support the pharmacy component of this model. Another key issue is how to integrate the

systemic therapy units with broader primary health care initiatives in the community — particularly physician-patient relationships with the family physician who provides the oncology care and the patient's regular family physician. More is needed to identify all of the implementation issues and to optimize the use of this approach to service delivery. This includes documenting comparative leading practices.

Recommendation 7: Develop better work processes through process mapping approaches to optimize the use of competencies and ensure effective use is made of all resources, including technology and informatics, to deliver care and ensure smooth workflow.

Some programs use process mapping to develop efficient and effective ways to deliver programs that make the best use of available resources and build in quality assurance. There is a need to build work processes to consider the skills and resources available to deliver care and ensure smooth workflow.

There are challenges to implementing new roles or optimizing competencies. These include care provider and patient attitudes and cultural issues, together with the traditional medical hierarchy, which impedes the ability to move forward.

Recommendation 8: Assess the effectiveness of inter-professional teams in providing patient-centred care and determine the enablers and barriers to their effective implementation.

The CWSS found incremental steps are taking place in most areas of the cancer control continuum to optimize service delivery:

- Various programs are exploring the use and implementation of new roles to alleviate shortages and to contribute to optimizing competencies and smoothly functioning teams.
- Inter-professional teams (seen as the "gold standard") are not without challenges. These include scheduling meetings to accommodate team members and the lack of administrative support. More evaluation and case studies of effective inter-professional teams in Canadian settings are needed to identify enablers and barriers to their further use.
- Inter-professional education (IPE) involves training in the "softer skills," such as conflict resolution, communication, and managing and working in a team environment. Equipping new students and health care providers who are already in the cancer control workforce with

these skills and knowledge base will benefit the inter-professional team environment and lead to the provision of optimal care to the patient and family. There is a general interest in incorporating IPE into health sciences programs, although implementation is just starting. Educational institutions are faced with a number of obstacles to achieving this, including traditional professional attitudes among some faculty members and health care providers, course scheduling challenges and programs that are already full.

- Innovative physician remuneration structures are welcomed as current inflexible structures challenge the implementation of inter-professional approaches to delivering care.

Chapter 8 Conclusion

The Cancer Workforce Scoping Study: A Report from the Front Lines of Canada's Cancer Control Workforce presents a compelling picture of the pressures facing the human resources environment in cancer control. While patients are receiving the care that is essential to manage their illnesses, many of the providers, at best, are barely managing to meet these needs — often at the expense of their own health. Many health care providers and managers stressed that something needs to be done: the current situation cannot continue. Some of the current challenges in pathology and other areas of cancer control support this assessment.

To ease these pressures and address the related issues and challenges, the CWSS makes eight recommendations. These recommendations call for the cancer control community to engage in effective planning, management and co-ordination of health human resources, to plan for a sustainable workforce, and to adapt and develop approaches to service delivery that will optimize use of the cancer control workforce today and in the future.

Decision-makers know the pressures on the cancer system and, as the report describes, they have taken action to deal with some immediate challenges.

The *Cancer Workforce Scoping Study*'s findings and recommendations are intended to lead to more discussions among decision- and policy-makers and to provide them with useful insights on how to enhance patient and family care and to promote a healthy and satisfied workforce.

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Acronyms

ASTRO – American Society for Therapeutic Radiology and Oncology
CACC – Canadian Advocacy Coalition of Canada
CAGPO – Canadian Association of General Practitioners in Oncology
CAMPEP – Commission on Accreditation of Medical Physics Educational Programs
CAMRT – Canadian Association of Medical Radiation Technologists
CAP – College of American Pathologists
CAPER – Canadian Physicians Education Registry
CARI – Canadian Association of Radiation Oncologists
CASN – Canadian Association of Schools of Nursing
CCH – Canadian Community Health Survey
CCO – Cancer Care Ontario
CCHS – Canadian Community Health Survey
CCPM – Canadian College of Physicists in Medicine
CCR – Canadian Cancer Registry
CDOAC – Chronic Disease Prevention Alliance of Canada
CEGEP – Collèges d'enseignement général et professionnel
CFPC – College of Family Physicians of Canada
CGFNS – Commission on Graduates of Foreign Nursing Schools
CIHI – Canadian Institute for Health Information
CMA – Canadian Medical Association
CMAJ – Canadian Medical Association Journal
CME – Continuing Medical Education
CMQ – Collège des médecins du Québec
CNA – Canadian Nurses Association
CON(C) – Certified in Oncology Nursing (Canada)
COPE – Community Oncology Professional Education
CPAC – Canadian Partnership Against Cancer
CPD – Continuing Professional Development
CGFNS – Commission on Graduates of Foreign Nursing Schools
CPGS – Clinical Practice Guidelines
CCNS – Cancer Care Nova Scotia
CSC – Cancer Services Collaborative
CSCC – Canadian Strategy on Cancer Control
CSRT – Clinical Specialist Radiation Therapist
CT – Computed Topography
CWPT – Cancer Workforce Planning Tool
CWSS – Cancer Workforce Scoping Study
DAPs – Diagnostic Assessment Programs
EFPPEC – Educating Future Physicians in Palliative and End-of-Life Care

EHR – Electronic Health Record
ETP – Entry-to-Practice
FFS – Fee-For-Service
FMRoCS – Family Medicine Residents of the Canadian Shield program
FOBT – Fecal Occult Blood Test
FPs – Family Practitioners
FTE – Full-Time-Equivalent
HHR – Health Human Resources
HPV – Human Papilloma Virus
HR-PIS – Human resources Planning and Information System
ICT – Information and Communication Technologies
IECPCP – Inter-professional Education For Collaborative Patient-Centred Practice
IEHP – Internationally Educated Health Professional
IENs – Internationally Educated Nurses
IMGS – Internationally Medical Graduates
IPE – Interdisciplinary Professional Education
LPN – Licensed Practical Nurse
MDTs – Multidisciplinary Teams
MLTs – Medical Laboratory Technologists
MRI – Magnetic Resonance Imaging
MRTs – Medical Radiation Technologists
NHS – National Health Service (United Kingdom)
NOSM – Northern Ontario School of Medicine
NPDB –National Practitioner Data Bank
NSWHN – National Survey of the Work and Health of Nurses
OECD – Organization for Economic Co-Operation and Development
ONDEC – Oncology Nursing Distance Education Course
ORTAP – Ontario Radiation Therapy Advanced Practice
PCM – Patient-Centred Management
PCTs – Primary Care Trusts
PHAC – Public Health Agency of Canada
PSA – Prostate-Specific Antigen
QA – Quality Assurance
RCPSC – Royal College of Physicians and Surgeons of Canada
RN – Registered Nurse
RNAO – Registered Nurses Association of Ontario
RTT – Radiation Therapy Technologist
SOS – System of Systems
UBC – University of British Columbia
UNBC – University of Northern British Columbia
UOIT – University of Ontario Institute of Technology

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Appendices

Appendix A: Methods employed in the CWSS

Literature review

Four rounds of searches were carried out. The first round employed the Medline search through OVID and with the assistance from the British Columbia Cancer Agency library. Health manpower, medical oncology (focus to manpower), radiation oncology (focus to human resources/manpower), oncology nursing (focus to human resources/manpower); as well as physicians and nurses (focus to supply and distribution and also mentioning cancer) were the search terms used. Literature primarily from Canada and the US were retrieved and for the time frame of the previous 10 years. Fifty-four from a total of 97 references identified were selected for further review. More details about the search logic are provided at the end of this Appendix.

The second round of search was expanded to include Australia, New Zealand and the United Kingdom. Articles were also identified for physician/doctor, oncology or nurses working in oncology. The search terms recruitment, retention, and remuneration were added. The results of this second search produced a further 76 references, 36 of which were selected for further review. The time frame was reduced to the last five years due the extent and magnitude of changes that occurred in health care in Canada over the last five years.

The third round of search expanded the search terms to consider additional occupations and human resource topics, in particular job satisfaction for all occupations and education for pathology. The final search focused on retrieving information identified by the study's steering committee and also, included an internet search on the various human resource themes suggested by the committee.

An on-line reference management system RefWorks was used to organize and manage the references collected from the literature searches.

Consultations

In addition to the literature and database scan and review of component 1, a total of 37 stakeholder groups from across Canada were interviewed. These stakeholder groups consisted of experts who manage or were involved with databases, and/or who were familiar with and knowledgeable of research work completed/underway in human resources and in cancer control. The study's steering committee, literature reviewed, and the Human Resources – Action Group (HR-AG) of CPAC assisted in identifying potential candidates. All of the interviews were conducted by telephone and were completed between November 2007 and February 2008. E-mail invitations were initially sent out to request an interview. This was followed by telephone calls to confirm availability. Appendix D contains the interview guides used for the interviews.

Telephone and in-person consultations were completed in component 2 to augment the results of the literature and database scan and review. Initial e-mail invites were distributed to potential candidates followed by telephone calls to confirm availability. Once again, the study's steering committee and CPAC's HR-AG assisted in identifying candidates. In addition, potential candidates were identified by participants in the interviews who in some cases, assisted by contacting the candidates themselves. Finally, candidates were also identified from the literature scan.

Representatives from each of the 10 disciplines selected for further study, educators, provincial and territorial cancer agencies, researchers, planners, patient advocate groups, and health providers from other disciplines were consulted from across Canada. In addition to the interviews, steering committee members assisted in setting up site visits Winnipeg, Manitoba, Dryden, Ontario, Thunder Bay, Ontario, and Saint John New Brunswick. A fifth site visit was held in Surrey, British Columbia. In-person interviews and focus groups were conducted in these sites. Appendix E outlines the number of consultations completed for each stakeholder group. Overall, a total of 146 individuals were consulted across Canada. Appendix F lists the organizations that participated in the consultations in both components 1 and 2.

Appendix G contains the interview guides that were used for the consultations in component 2. Although all interview guides contained core questions, six guides were developed with questions tailored specifically to the type of stakeholder representative. Appendix H provides the guides used to conduct the focus groups. A total of eight focus groups were conducted across four sites. A number of these focus groups were heterogeneous that included health care providers involved with supportive care, prevention and aboriginal care, IPE and community cancer networks while the homogenous focus groups consisted of nurses, radiation therapists, and medical physicists and dosimetrists.

Overview of literature search methods

The following strategies were used to search Medline for relevant articles published in the scientific literature. A number of individual searches were conducted between September 2007 and April 2008; the primary strategies used are provided below. Some searching based on similar strategies was also conducted in January 2008 to identify material on job satisfaction in the oncology workforce as well as education by specific occupations. Finally, a more general search on models for service delivery was conducted in March and April of 2008. All searching was supplemented by articles recommended for review by CWSS respondents and for which individual citations were downloaded from PubMed into RefWorks, an online reference management system. In addition, numerous reports and electronic materials were captured in RefWorks, for material not included in PubMed.

Main strategies used to search literature

Database: Ovid MEDLINE(R) <1996 to October Week 2 2007>

Search Strategy:

1. Health Manpower/ (1635)
2. exp neoplasms/ (747912)
3. *"Health Services Needs and Demand"/ (5324)
4. medical oncology/ or radiation oncology/ (5417)
5. Medical Oncology/ma [Manpower] (84)
6. radiation oncology/ma (85)
7. Oncologic Nursing/ma [Manpower] (54)
8. 5 or 6 or 7 (213)
9. *"Physicians"/sd [Supply & Distribution] (878)
10. exp Nurses/sd [Supply & Distribution] (1006)
11. 9 or 10 (1855)
12. 2 or (cancer or oncol:) (ti) (753566)
13. 11 and 12 (13)
14. 1 and 2 (9)
15. 5 or 6 or 7 (213)
16. exp canada/ (39389)
17. 15 and 16 (11)
18. exp north america/ (416426)
19. 15 and 18 (81)
20. 13 or 14 or 19 (99)
21. limit 20 to english language (99) **this set constituted the first search in Sept 2007**
22. exp australia/ or exp great britain/ or new zealand/ (139875)
23. 15 and 22 (31)
24. (recruit: or Retent: or remunerat:) (ti) (12911)
25. 5 or 6 or 7 (213)
26. 24 and 25 (6)
27. (physician: or doctor: or oncolog: or nurses) (tw) (180890)
28. 24 and 27 (638)
29. 28 and exp *neoplasms/ (40)
30. (physician: or doctor: or oncolog: or nurs:) (tw) (231816)
31. 1 or 3 or 5 or 6 or 7 or 9 or 10 (8665)
32. 30 and 31 (2586)
33. 18 or 22 (549162)
34. 32 and 33 (1670)
35. 12 and 24 (865)
36. 1 or 3 or 4 or 5 or 6 or 7 or 9 or 10 (13899)
37. 35 and 36 (10)
38. 23 or 26 or 29 or 37 (81)
39. 21 not 38 (96)
40. 38 not 21 (78)

41. limit 40 to english language (76)
42. from 41 keep 1-76 (76) **this set of records constituted the second search**

Additional searching was done using the following strategy to look at broader issues of service delivery in March 2008:

1. (cancer or oncology).mp. [mp=title, original title, abstract, name of substance word, subject heading word] (631720)
2. exp canada/ or exp North America/ or exp australia/ or exp great britain/ or exp new zealand/ (1273986)
3. *"delivery of health care"/ or *managed care programs/ or *telemedicine/ or *patient care team/ or *nursing, team/ or *patient-centered care/ (65596)
4. models, nursing/ or models, organizational/ (18468)
5. *Organizational Case Studies/og, st, sn, mt [Organization & Administration, Standards, Statistics & Numerical Data, Methods] (10)
6. *"Continuity of Patient Care"/ (4479)
7. models of care.mp. (528)
8. 3 or 4 or 5 or 6 or 7 (86023)
9. 1 and 2 and 8 (829)
10. limit 9 to (english language and humans and yr="2002 - 2008" and (classical article or comparative study or consensus development conference or consensus development conference, nih or evaluation studies or journal article or meta analysis or multicenter study or "review")) (356)
11. from 10 keep 1-356 (356)

Appendix B: Delphi process used to select 10 occupations for in-depth study

A two round Delphi[27] was used to select the occupations for further study in the *Cancer Workforce Scoping Study*. The Steering Committee members participated in the Delphi process.

Round 1: Using criteria to guide their review, participants selected 15 occupations from the comprehensive list of occupations in the cancer control workforce (developed for the scoping study) that they considered to most warrant inclusion in the scoping study. Participants also provided the main reasons for their selections.

Round 2: The aim was to identify and confirm the 10 occupations that will be studied in more detail for the purposes of the *Cancer Control Workforce Scoping* project. Participants were asked to review the results of the first round of the Delphi together the further revisions made to the comprehensive list of occupations in the cancer control workforce.

As a result of the two rounds of the Delphi process, 10 occupations were identified for further investigation in the *Cancer Workforce Scoping Study*. These resulting 10 occupations represented the cancer continuum.

Selection of cancer control occupations to study

Process Overview

The Delphi technique[28] will be used to decide which cancer control occupations to study. We will use a three-phase process as follows:

1. Participants will be asked to prepare a short-list of 15 occupations for further consideration and to send the list to the process coordinator, Christine Da Prat.

2. The coordinator will compile the results from this first round of inquiry and the research team will use the results to conduct an assessment of the group's opinions. Any dominant, highly evaluated occupations that emerge via consensus will be included in the list of occupations that will be studied. The research team will share the results and assessment with all participants and will prepare instructions for a second round of inquiry to narrow down the list of occupations for consideration.

3. Participants will be asked to review the results from the first round and to prepare a second short-list of occupations, following a new set of instructions.

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[27] You can access a short introduction to the Delphi technique (Dunham, 1996) at: http://www.medsch.wisc.edu/adminmed/2002/orgbehav/delphi.pdf

[28] You can access a short introduction to the Delphi technique (Dunham, 1996) at: http://www.medsch.wisc.edu/adminmed/2002/orgbehav/delphi.pdf

4. The coordinator will compile the results from this second round of inquiry and will share them with the participants. The research team will again conduct an assessment of the group's opinions, based on the data from this second round, and will determine whether a third round of inquiry is necessary.

5. If consensus does not emerge about the dominant occupations to include in the study, the decision will be resolved using the Nominal Group Technique.

Instructions for First Round of Inquiry

1. Review the Comprehensive List of Occupations for Cancer Control (pages 2-5).

2. Assess each of the 75 occupations against the assessment criteria provided in the Assessment Guide (page 6).

3. Review your assessments and prepare a short-list of 15 occupations that you believe should be considered in the second round of inquiry.

4. Briefly state (in 5 sentences or less) the rationale for each of your selections.

5. Send your short-list and rationale to Christine Da Prat at: christine@associationstrategygroup.com by Monday, October 15.

Preparation for Second Round of Inquiry

You will receive the next set of instructions on Wednesday, October 17.

Please submit your second round input to Christine by Monday, October 22.

Comprehensive List of Occupations for Cancer Control

		Prevention	Screening and Early Detection	Diagnosis	Treatment	Supportive & Rehab Care	Palliative Care
Physician							
1	Family Physician / General Practitioner (FP/GP)	1	1	1	1	1	1
2	Clinical geneticist	1	1	1			
3	Dermatologist	1	1	1		1	
4	Gastroenterologist		1	1	1		
5	Gynecologist		1	1	1		
6	Hematologist	1	1	1	1	1	1
7	Opthamologist		1	1	1	1	
8	Palliative care physician					1	1
9	Pathologist		1	1			
10	Pediatric Hematologist	1	1	1	1	1	1
11	Pediatrician	1	1	1	1	1	1
12	Psychiatrist					1	1
13	Rehabilitative physician					1	
14	Staff physician				1		
15	General Surgeon		1	1	1		
16	Plastic surgeon					1	
17	Surgical specialists: ENT, Thoracic, Plastic, Gynecologist, Orthopedic		1	1	1		
18	Radiologist		1	1	1		
19	Urologist		1	1	1		
20	***Oncology***						
21	Medical oncologist		1	1	1	1	1

		Prevention	Screening and Early Detection	Diagnosis	Treatment	Supportive & Rehab Care	Palliative Care
22	Clinical associate			1	1		
23	Radiation oncologist				1		1
24	Surgical oncologist				1		
25	Paediatric oncologist		1	1	1	1	1
Nursing Care							
26	Advanced practice nurse/Nurse Practitioner		1	1	1	1	1
27	Registered Nurse	1	1	1	1	1	1
28	Licensed/Registered Practical Nurse	1	1	1	1	1	1
29	Personal care attendant/home care worker				1	1	1
30	Care aides				1	1	1
Technologists / Technicians							
31	Biomedical electronic technologists		1	1	1		
32	Cast/mould technician				1		
33	Cervical cytology technologist		1	1			
34	Dental hygienist	1	1	1	1	1	1
35	Linear accelerator service technician				1		
36	Machinists		1	1	1	1	
37	Magnetic resonance technologists (MRI)		1	1			
38	Nuclear medicine technologist		1	1			
39	Pharmacy Technician				1	1	1
40	Radiation therapist				1		

		Prevention	Screening and Early Detection	Diagnosis	Treatment	Supportive & Rehab Care	Palliative Care
41	Radiological technologist (CT, X-ray, ultrasound, etc)		1	1			
42	Mammography technologist		1	1			
Allied Health Professionals							
43	Dentist	1	1	1	1	1	1
44	Dietitian (registered)				1	1	
45	Genetics Counsellor		1	1			
46	Medical physicist				1		
47	Medical dosimetrist				1		
48	Oncology pharmacist				1	1	1
49	Pharmacist				1	1	1
50	Physiotherapist					1	1
51	Psychologist					1	1
52	Occupational therapist					1	1
53	Speech therapist					1	1
54	Social worker			1	1	1	1
Education, Complementary, Spiritual, Volunteer							
55	Health Education	1	1	1			1
56	Health Promotion	1	1				
57	Complementary therapists (e.g., art and music)					1	1
58	Spiritual/Pastoral care			1	1	1	1
59	Family caregivers			1	1	1	1
60	Volunteers	1	1	1	1	1	1
Informatics							
61	Cancer registrars	1	1	1	1		

		Prevention	Screening and Early Detection	Diagnosis	Treatment	Supportive & Rehab Care	Palliative Care
62	Clerical staff	1	1	1	1	1	1
63	Data managers	1	1	1	1		
64	Health record technicians	1	1	1	1	1	1
65	Systems Analysts/ Computer programmers	1	1	1	1	1	1
Research							
66	Basic Researcher	1	1	1	1		
67	Biostatistician	1	1	1	1	1	1
68	Clinical researcher		1	1	1	1	1
69	Epidemiologist	1	1	1	1	1	1
70	Health Services research	1	1	1	1	1	1
71	Population researcher	1	1	1	1	1	1
72	Social science research	1	1	1	1	1	1
Leadership and Coordination							
73	Patient Navigator		1	1	1	1	1
74	Bereavement Coordinators						1
75	Program Managers	1	1				
N = 75	***Total***	***25***	***47***	***48***	***55***	***45***	***42***

Assessment Guide

	Below Average	Average	Above Average
A. Impact of the occupation on cancer control			
Relative to other occupations, what impact does this occupation have on controlling:			
1. the incidence of cancer in Canada?			
2. the quality of life for individuals diagnosed with cancer?			
3. cancer mortality rates in Canada?			
B. Criticality of the occupation to the cancer control system as a whole			
Relative to other occupations, what impact would a shortage of qualified workers in this occupation have on the effectiveness of the cancer control system as a whole?			
C. Link between technology, training and occupational requirements			
1. Relative to other occupations, what impact will new or emerging technologies likely have on training requirements for individuals this occupation?			
2. Relative to other occupations, what impact will new or emerging technologies likely have on individuals' work in this occupation?			
D. Link between cancer control program scope and demand for qualified human resources			
Relative to other occupations, what impact would an expansion of cancer control programs (such as the launch of new programs or change in scope to existing programs) have on the demand for qualified workers in this occupation?			
E. Degree of study of the occupation			
Relative to other cancer control occupations, the human resource-related body of knowledge about this occupation is:			
F. Emergence of roles performed by individuals in the occupation and relationship with emergence of the discipline and cancer control delivery models			
1. Is this occupation part of an emerging cancer control *discipline* in Canada?	Yes	No	
2. To what degree is this *occupation* emerging?	Low	Medium	High

Cancer Workforce Scoping Study

Selection of Cancer Control Occupations to Study

Delphi Process Round 2

1.0 Round 1 Results

A two round Delphi[29] is being used to select the occupations to study in the cancer workforce scoping study and the Pan-Canadian labour market study. The first round of the process is now complete. Using criteria to guide their review, participants selected 15 occupations from the comprehensive list that they considered to most warrant inclusion in the scoping and Pan-Canadian labour market studies. Participants also provided the main reasons for their selections.

1.1 Summary of Results of the First Round of the Delphi Process:

Seven of 12 steering committee members responded to the first round. In the first round, 16 occupations were selected by three or more participants (refer to Appendix A). These occupations were distributed by category as follows: physician care (N=5); oncology (N=4); other health professionals (N=4); nursing care (N=2); and research (N=1).
Appendix B presents these 16 occupations across the cancer continuum.

2.0 Round 2

The second round of the Delphi process aims to identify and confirm the 10 occupations that will be studied in more detail for the purposes of the *Cancer Control Workforce Scoping* project. We will be using the literature and data review combined with the expert interviews to identify which of the 10 occupations warrant inclusion in the Pan-Canadian labour market study.

2.1 Instructions for the Second Round of the Delphi Process:

1. Please review:
   a. The 16 occupations presented in Appendices A and B together with the rationale for the selection of each.

   b. Appendices C and D.

      - *Appendix C* lists all the occupations that were identified by two participants in the first round of inquiry of the Delphi process.
      - *Appendix D* presents the revised comprehensive list of occupations defining the cancer control workforce, including several revisions suggested since the first round of the Delphi. Four new occupations have been added: Registered Psychiatric Nurse, Medical Laboratory Technician, Clinical Genetics Technologist, and, Psychosocial Researcher and are bolded in the attachment.

[29] You can access a short introduction to the Delphi technique (Dunham, 1996) at: http://www.medsch.wisc.edu/adminmed/2002/orgbehav/delphi.pdf

Based upon your review of appendices A, B, C and D, please select the **10** occupations that you recommend for further study in the *cancer workforce scoping project*.
Consider the following questions in your selection:

1. Do the 10 occupations selected:

    - adequately cover the continuum of care?
    - consider emerging roles?
    - cover the range of professional background

Please send your completed table to Christine Da Prat at christine@associationstrategygroup.com or by fax at (613) 233-6158 by end of business day **Monday, November 12, 2007**.

Appendix C: Comprehensive list of occupations for cancer control

Occupation		Prevention	Screening and Early Detection	Diagnosis	Treatment	Supportive & Rehab Care	Palliative Care
Physician Care							
1	Family Physician / General Practitioner (FP/GP)	1	1	1	1	1	1
2	Clinical geneticist	1	1	1			
3	Dermatologist	1	1	1	1	1	1
4	Gastroenterologist		1	1	1	1	1
5	Gynecologist		1	1	1		
6	Hematologist	1	1	1	1	1	1
7	Opthamologist		1	1	1	1	
8	Palliative care physician				1	1	1
9	Pediatric palliative care physician				1	1	1
10	Pathologist		1	1			
11	Pediatric Hematologist	1	1	1	1	1	1
12	Pediatrician	1	1	1	1	1	1
13	Psychiatrist					1	1
14	Rehabilitative physician					1	
15	Staff physician				1	1	1
16	General Surgeon		1	1	1	1	1
17	Plastic surgeon					1	
18	Surgical specialists: ENT, Thoracic, Plastic, Gynecologist, Orthopedic		1	1	1	1	1
19	Radiologist		1	1	1	1	1
20	Anesthesist		1	1	1		

Occupation		Prevention	Screening and Early Detection	Diagnosis	Treatment	Supportive & Rehab Care	Palliative Care
21	Urologist		1	1	1	1	1
	Oncology						
22	Medical oncologist		1	1	1	1	1
23	Clinical associate			1	1		
24	Radiation oncologist				1		1
25	Surgical oncologist				1		1
26	Paediatric oncologist		1	1	1	1	1
Nursing Care							
27	Nurse Practitioner	1	1	1	1	1	1
28	Clinical Nurse Specialist	1	1	1	1	1	1
29	Registered Nurse	1	1	1	1	1	1
30	Licensed/Registered Practical Nurse	1	1	1	1	1	1
31	Registered Psychiatric Nurse			1	1	1	1
32	Personal support worker/home care worker				1	1	1
33	Care aides/patient care assistant				1	1	1
Technical Care							
34	Biomedical electronic technologists		1	1	1		
35	Diagnostic cytology technologists	1	1	1	1		
36	Linear accelerator service technician				1		
37	Machinists		1	1	1	1	
38	Medical laboratory technologist	1	1	1	1	1	1
39	Clinical genetics technologist	1	1	1	1		
40	Pharmacy Technician				1	1	1

	Occupation	Prevention	Screening and Early Detection	Diagnosis	Treatment	Supportive & Rehab Care	Palliative Care
Other Health Professionals							
41	Dentist	1	1	1	1	1	1
42	Dental hygienist	1	1	1	1	1	1
43	Dietitian (registered)	1			1	1	1
44	Genetics Counsellor		1	1			
45	Medical physicist				1		
46	Medical Radiation Technologist (incl. MRI, Nuclear medicine tech., radiological tech. (incl. CT, X-ray, ultrasound, mammography)		1	1	1	1	
47	Medical dosimetrist/treatment planner				1		1
48	Radiation therapist (incl. cast/mould tech)				1		1
49	Oncology pharmacist				1	1	1
50	Pharmacist	1			1	1	1
51	Physiotherapist				1	1	1
52	Psychologist				1	1	1
53	Occupational therapist				1	1	
54	Speech language pathologist				1	1	
55	Audiologist		1		1	1	1
56	Hospice counsellors/coordinators					1	1
57	Optometrist	1	1		1	1	1
58	Social worker			1	1	1	1
Education, Complementary, Spiritual, Volunteer							
59	Health Education	1	1	1	1	1	1
60	Health Promotion	1	1				

Occupation		Prevention	Screening and Early Detection	Diagnosis	Treatment	Supportive & Rehab Care	Palliative Care
61	Complementary therapists (e.g., art and music)				1	1	1
62	Spiritual/Pastoral care			1	1	1	1
63	Family caregivers			1	1	1	1
64	Volunteers (incl. hospice volunteers and cancer agency volunteers)	1	1	1	1	1	1
Informatics							
65	Cancer registrars	1	1	1	1		
66	Clerical staff	1	1	1	1	1	1
67	Data managers	1	1	1	1	1	1
68	Health record technicians	1	1	1	1	1	1
69	Systems Analysts/ Computer programmers	1	1	1	1	1	1
Research							
70	Basic Researcher	1	1	1	1	1	1
71	Biostatistician	1	1	1	1	1	1
72	Clinical researcher		1	1	1	1	1
73	Epidemiologist	1	1	1	1	1	1
74	Health Services researcher	1	1	1	1	1	1
75	Population researcher	1	1	1	1	1	1
76	Psychosocial researcher				1	1	1
	Applied research						
77	Social science researcher	1	1	1	1	1	1
Leadership and Coordination							
78	Patient Navigator		1	1	1	1	1
79	Bereavement Coordinators						1

Occupation		Prevention	Screening and Early Detection	Diagnosis	Treatment	Supportive & Rehab Care	Palliative Care
80	Program / Clinical Manager	1	1	1	1	1	1
81	Nurse Educator	1	1		1	1	1
Education of Professions							
82	Educators				1	1	1
N = 82	***Total***	***33***	***51***	***51***	***75***	***65***	***63***
	Do we include the following:						
1	volunteer coordinator						
2	registered massage therapist or incl. as complementary therapists						
3	naturopathic physician						
4	nutrition researcher						
5	denturist						

Appendix D: Assessment of databases and data availability for the cancer control workforce

The material in this appendix documents the major data bases available in Canada that contain information relevant in particular to the 10 selected occupations in the cancer workforce. Table 4.1 lists the databases and provides contact information. Table 4.2 summarizes the purpose and content of each database, while quality is assessed in Table 4.3. Finally, Table 4.4 summarizes the gaps and opportunities. Not all databases were assessed for each table, as for some, information on the oncology workforce was limited.

The remainder of this appendix will provide a narrative summary of information by provider group.

Physicians

The medical profession is one of the best documented provider groups at the national and provincial/territorial levels within Canada, however a number of gaps and inconsistencies occur, which require careful attention and planning to fully use and interpret data. Data holdings for physicians are maintained by the Canadian Medical Association (CMA), the College of Family Physicians of Canada (CFPC), and the Canadian Institute for Health Information (CIHI).

The CMA Master File contains 'head counts' of all physicians who are CMA members by specialty, age, gender and postal code and is produced in January of each year, however it lacks information on what physicians are doing, how many hours they work, or even if they are practicing in Canada at all. Scott's Medical Database, now maintained by CIHI, includes nearly all physicians in Canada and can be used to provide information each year on supply, distribution and migration of physicians. Data are available by age, gender, specialty, postal code and education, but do not include education or place of employment. CIHI also maintains the National Physician Data Base (NPDB), which annually monitors summary data on physician services and payments for planning purposes, including calculation of full-time equivalents (FTEs). The NPDB, while having many strengths in its ability to understand what services are provided by the medical profession is increasingly limited by its reliance on data provided through the Fee-for-Service (FFS) system; the NPDB does not include any information on physician services provided through other remuneration methods such as block funding for radiology and laboratory services, or to cancer centres.

The National Physician Survey (NPS) is maintained by the CFPC in collaboration with the CMA and the Royal College of Physicians and Surgeons of Canada (RCPSC). This survey is conducted every few years, most recently in 2004 and 2007, and aims to collect information from all physicians in Canada on a variety of topics including age, gender, specialty, workload, education, employment, remuneration, working conditions and so on. While providing much useful information not available elsewhere, interpretation of results is hampered by a relatively low response rate of 36% (2004).

Finally, the Canadian Post-MD Education Registry (CAPER) registry maintained by the Association of Faculties of Medicine (AFMC) tracks all physicians receiving post MD training in Canada by age, sex and sub-specialty, and is organized as a longitudinal file for national medical manpower planning. However, this data set does not capture residency training in

rural/remote settings, or on diversity topics such as income level, ethnic status or rural/urban origins. Finally, the AFMC also maintains a data set on International Medical Graduates which was not assessed further for this study, due to advice received that the data set was not particularly useful for oncology.

In addition to the above data sets, which regularly publish and disseminate information to the public, the Canadian Association of Radiation Oncology (CARO) annually collects information on its membership to monitor supply and demand. The data are used largely for internal planning purposes.

Six of the 10 selected occupations for the CWSS study are physician specialties. Data are readily available for family physicians, the largest group which includes both family practice specialists plus general practitioners. Data for radiation and medical oncologists are often presented in publications by medical specialty, although medical oncology can be lumped in with internal medicine. Pathology is included in laboratory medicine, and is therefore usually reported either by each of the four sub-specialties or together with all laboratory specialists.

However, major information gaps remain. Since palliative care is a relatively new specialty as of 1999, with relatively small numbers, many data sets do not track this group, with a major exception being CAPER for education and residency positions. Surgical oncologists as a specialty are not tracked separately in Canada. Most cancer surgery is performed by other surgical specialists (e.g., neurosurgery or urology) as well as by general surgeons.

Considerable challenges exist in fully exploiting these data sets to understand the many issues facing Canada's physician workforce. While the various organizations responsible for maintaining the data sets work closely together on many issues, privacy issues, the ability to link data sets, and the ongoing need to respond to changes in the health care system were identified as concerns.

Nurses

Considerable information is available for the regulated nursing workforce, which includes registered nurses (RNs), licensed practical nurses (LPNs), and registered psychiatric nurses (RPNs). More limited information is published for the much smaller numbers of oncology nurses and nurse practitioners. Main data holdings include the Registered Nursing Database maintained by CIHI, which includes considerable information on all RNs employed in Canada, and the 2005 National Survey of the Work and Health of Nurses (NSWHN), a joint project of CIHI and Statistics Canada, which includes information from a stratified sample survey of 23, 428 nurses (of whom 18,676 responded for an 80% response rate). Additional nursing data bases are maintained by CIHI on LPN, and RPN, however, only limited information on oncology is available in the LPN data base, while oncology is not an option on the RPN.

The Canadian Association of Nurses in Oncology (CANO) collects information on its membership. Their membership includes less than half of all nurses reporting working in oncology and is mainly used to monitor trends and concerns of its membership, primarily for internal purposes.

In addition the Canadian Nurses Association (CNA) manages a certification database and a nursing education program data bases which includes continuing education oncology certification programs. The Canadian Association of Schools of Nursing (CASN) has a

database that tracks only the undergraduate programs. The CNA and CASN also maintain a national student faculty data base. Data from some of these data sets are published in CIHI publications organization websites. The data bases were not assessed for this report.

Other selected occupations

Limited data are currently available for radiation therapists, however this will soon change as this occupation will be included in a new CIHI data base for all medical radiation technologists (MRTs) coming on stream for the 2008 data year.(CIHI, 2006) While CIHI reports on the numbers of MRTs, the most recent and detailed figures were published by CMART for 2005.(CAMRT, 2006) Notably, CIHI is developing five new databases for Occupational Therapists, Pharmacists, Physiotherapists, Medical Laboratory Technologists, and Medical Radiation Technologists, all of which are occupations working with cancer patients. Data collection for the first two groups started for the 2006 data year, for physiotherapists in 2007 and for the final two groups in 2008.

Medical physicists are identified in the CIHI health professionals' data base (not assessed in this table), which provides very basic supply-side data for various occupations.(CIHI, 2006) Data are limited in that only voluntary membership data are available for this group.

Additional data sources

Several data bases maintained by Statistics Canada that contain information about all occupation in the Canadian workforce also contain information relevant to the cancer control workforce. This is especially true for the larger occupational groups which have a dedicated 4-digit code in the Standard Occupational Classification used at Statistics Canada, including family physicians, specialist physicians, registered nurses, and medical radiation therapists (which include radiation therapists). Thus, for the following occupations, the coding structure is precise enough to permit tabulation of information for these groups.

Table 1: Coding structure for the Labour Force Study showing selected Occupations for CWSS study

D01	**Physicians, Dentists and Veterinarians**
D011	Specialist Physicians
D012	General Practitioners and Family Physicians
D03	**Pharmacists, Dietitians and Nutritionists**
D031	Pharmacists
D032	Dietitians and Nutritionists
D04	**Therapy and Assessment Professionals**
D042	Physiotherapists
D043	Occupational Therapists
D11	**Nurse Supervisors and Registered Nurses**
D111	Head Nurses and Supervisors
D112	Registered Nurses
D21	**Medical Technologists and Technicians (Except Dental Health)**
D211	Medical Laboratory Technologists and Pathologists' Assistants
D212	Medical Laboratory Technicians

D215 Medical Radiation Technologists

This coding structure is used by the Census of Canada (2001 and 2006), the Labour Force Survey on employment patterns and numbers and the Canadian Community Health Survey (CCHS). The Census, a comprehensive survey of all Canadians that is conducted every five years, collects occupation data on a 20% sample of respondents. Occupation data may then be analyzed by all other census variables. The monthly Labour Force Survey is a stratified sample survey that monitors labour force attachment of the Canadian workforce, and can provide very current information on the various occupations. The Canadian Community Health Survey, a large sample cross-sectional survey that collects information related to health status, health care utilization and health determinants for a large sample of the Canadian population. While the primary use of CCHS data is for health surveillance, such as in prevalence of disease and other forms of health research, it is possible to analyze these population work force health characteristics by the occupation of respondents.

Table A1.1 – Contact information for databases containing information relevant to the cancer workforce

	Data Base - Name	Custodian Organization	Weblink	Contact Name	Phone Number	Location	Comments
Physicians Data							
1	National Physician Data base (NPDB)	CIHI	www.cihi.ca	Robert Kyte	613-241-7860	CIHI, Ottawa	fee for service data
2	Scotts Medical Database (SMB)	CIHI	www.cihi.ca	Robert Kyte Yvonne Rosehart	613-241-7860	CIHI, Ottawa	(formerly Southam Medical Database at CMA)
3	National Physician Survey (NPS)	CFPC	www.nationalphysiciansurvey.ca/nps	Sarah Scott	905-629-0900 ext 289	CFPC, Toronto area	formerly JANUS survey. Info provided by Lynda Buske
4	CMA Master File	CMA	www.cma.ca	Lynda Buske	613-731-8610, ext 2252	CMA, Ottawa	
5	Canadian Post-MD Education Registry	CAPER, AFMC	www,caper.ca	Steve Slade	613-730-1204, ext 224	AFMC, Ottawa	
6	International Medical Graduates (IMG)	CAPER, AFMC	www,caper.ca	NA	NA	AFMC, Ottawa	not seen as useful for oncology, monitors flows of IMGs
Nurses Data							
7	Registered Nurses Database (RNDB)	CIHI	www.cihi.ca	Andrea Porter-Chapman	613-241-7860 x 4440	CIHI, Ottawa	info provided by email
8	Licensed Practical Nurses Database (LPNDB)	CIHI	www.cihi.ca	"	Aporter-Chapman@cihi.ca	"	info provided by email
9	Registered Psychiatrice Nurses Database (RPDB)	CIHI	www.cihi.ca	"	"	"	info provided by email
10	Nursing Education Programs Database	CASN	www.casn.ca			CASN, Ottawa	info obtained from website of Canadian Association of Schools of Nursing
11	National Survey of the Work and Health of Nurses (NSWHN)	CIHI/STC	www.cihi.ca www.statcan.ca	Robin Carriere - CIHI - or Fil McLeod - STC	STC:613-951-9003	CIHI, Ottawa, STC, Ottawa	info obtained from STC Survey Report, K Wilkins and A Porter-Chapman

	Data Base - Name	Custodian Organization	Weblink	Contact Name	Phone Number	Location	Comments
Other Health Providers							
12	Occupational Therapist Data Base (OTDB), Pharmacist Data Base (PDB), Physiotherapist Data Base (PTDB), Medical Lab Technologist Data Base (MLTDB), Medical Radiation Technologist Data Base (MRTDB)	CIHI	www.cihi.ca	Michael Rajendram	613-694-6890	CIHI, Ottawa	These are 5 closely related databases currently under development at CIHI
Multiple Occupations							
13	HR-PIS, now CWPT (Cancer Workforce Planning Tool)	CAPCA	NA	Muneerah Kassam	604-451-5727	CAPCA, Vancouver	Database is under development
Professional Organization							
14	CARO	CARO	www.caro-arco.ca	Mike Milosevic	416-946-2125	PMH, Toronto,	Internal use for CARO
15	CANO	CANO	www.cano-acio.org	Kim Chapman	506-452-5220	New Brunswick	Managed by Malachite in Vancouver, 604-874-4378
16	Canadian Association of Pediatric Oncologists	not on selected list of occupations					
Other Sources							
17	Census of Canada 2001	STC	www.statcan.ca	Sandra Swain	613-951-6908	STC, Ottawa	4 digit codes, 2008 census to be released on March 4, 2008
18	Labour Force Survey (monthly)	STC	www.statcan.ca	Christel LePetit	613-951-3856	STC, Ottawa	At 4-digit level only
19	Canadian Community Health Survey	STC	www.statcan.ca			STC, Ottawa	Contains information by occupation, by 4-digit codes, some useful data available
Other databases suggested for review but not excluded from this analysis include: STC Education data; National Accounts, and Micro-economic analysis; also Taxation data							

Table A1.2 – Cancer Workforce Scoping Study - Data base Purpose and Content

Physician Data	1	2	3	4	5	6
Data Base Name	**National Physician Data base (NPDB)**	**Scotts Medical Database (SMB)**	**National Physician Survey (NPS)**	**CMA Master File**	**Canadian Post-MD Education Registry**	**International Medical Graduates**
Purpose	monitor summary data on physician services and payments to facilitate physician resource and service utilization planning	to provide information on the supply, distribution and migration (internal and external) patterns of Canadian physicians	to highlight trends in physician resource issues and to describe physician populations	provides head counts by speciality	longitudinal file for national medical manpower planning	not assessed
Coverage	all physicians billing to at least one service to a Fee-for-Service code; omits NU and NWT, and physicians on 100% salary or contract	almost all physicians in Canada	all medical doctors, 2nd year residents, all medical students	all CMA members	all physicians receiving post MD training in Canada	
Type	incomplete census	census, all provinces	census survey, 36% response rate	census, all provinces	census, all provinces	
Year	1970 on paper; 1984-electronic	~1970 electronic	2004 and 2007	1980s or earlier	1989 -	
Occupations	physicians by all sub-specialties	all physicians by up to 4 sub-specialties	all physicians by sub-specialty	all physicians by sub-specialty	all physicians by sub-specialty	
Data	aggregate (at national level); microdata at provincial	microdata, dynamic	individual microdata	individual microdata, dynamic	individual microdata	
Demographic	DOB, gender	age, gender	age, gender	age, gender	age, gender	
Geographic	postal code; place of graduation	postal code	province employed, rural/urban	postal code	provinces, faculty of training, some urban/rural, location of practice 2, 5 &10 yrs post training	
Education	Latest speciality; place of speciality; year of speciality	place of graduation	where and yr graduated, place completed for post-graduate	sub-speciality		

Physician Data	1	2	3	4	5	6
Data Base Name	**National Physician Data base (NPDB)**	**Scotts Medical Database (SMB)**	**National Physician Survey (NPS)**	**CMA Master File**	**Canadian Post-MD Education Registry**	**International Medical Graduates**
Employment	FTE indicator derived from FFS billing; quality deteriorating	(self-reported, not reliable)	full-time/part-time and hours of work; place employed			
Remuneration	possibly at provincial level	type	type			
Migration	use physician ID to track across Canada	use physician ID to track across Canada		tracked for last 10 yrs in and out of country		
Other	FFS codes to track services provided	includes physicians in both clinical and non-clinical, such as research, teaching and admin	JANUS in 2001	use January Master File		

Nurses Data	7	8	9	10
Data Base Name	**Registered Nurses Database (RNDB)**	**Licensed Practical Nurses Database (LPNDB)**	**Registered Psychiatric Nurses Database (RPDB)**	**National Survey of the Work and Health of Nurses (NSWHN)**
Purpose	to provide information on the supply and distribution of RNs in Canada	to provide information on the supply and distribution of LPNs in Canada	to provide information on the supply and distribution of Registered Psychiatric Nurse	to examine links between the work environment and the health of regulated nurses in Canada
Coverage	all RNs in Canada who are actively employed RNs; excludes registered RNs not employed in nursing	all LPNs in Canada who are actively employed; excludes LPNs not employed in nursing	all RPNs who are actively employed in MB, SK, AB and BC	all employed, regulated nurses, including RNs, LPNs, and RPNs in Canada
Type	complete census	complete census, except for Nunavut	census for 4 provinces only	stratified sample survey of 23,428 nurses; 18676 responded (80%)
Year	1980-present	2002- present	2002- present	2005
Occupations	RNs, Nurse Practitioners (since 2003), oncology an option	Licensed Practical Nurses, oncology an option	Registered Psychiatric Nurses, oncology not an option	RNs, RPNs, LPNs, oncology an option
Data	individual microdata	individual microdata	individual microdata	individual microdata

Nurses Data	7	8	9	10
Data Base Name	**Registered Nurses Database (RNDB)**	**Licensed Practical Nurses Database (LPNDB)**	**Registered Psychiatric Nurses Database (RPDB)**	**National Survey of the Work and Health of Nurses (NSWHN)**
Demographic	YOB, gender	YOB, gender	YOB, gender	age, gender, marital status
Geographic	province/territory of graduation; province/territory employed	province/territory of graduation; province/territory employed	province/territory of graduation; province/territory employed	postal code of residence
Education	initial education, highest degree obtained	education for practical nurse; other education	initial education, highest degree obtained	
Employment	multiple employer status; status as direct care, admin, education, research	multiple employer status; status as direct care and not stated	multiple employer status; status as direct care, admin, education, research	Type of care. Work setting, work hours, overtime, multiple jobs, shifts, flexibility
Remuneration	No	No	No	household income,
Migration	No, except from province of education to current province, as no national ID #	No, except from province of education to current province, as no national ID #	No, except from province of education to current province, as no national ID #	No
Other	place of work; area of responsibility,	place of work; area of responsibility,	place of work; area of responsibility: Note: oncology is not an option	oncology was chosen by 2% of respondents; many other variables on work and health

Other Health Providers	11
Data Base Name	**Occupational Therapist (OTDB), Pharmacist (PDB), Physiotherapist (PTDB), Medical Lab Technologist (MLTDB), Medical Radiation Technologist (MRTDB)**
Purpose	These five data bases will provide standardized comparable data on the demographic, geographic, education and employment characteristics for each of the professions in Canada
Coverage	all of these professionals registered with the provincial regulatory body (national for territories)
Type	census; PDB omits QC and NB, PTDB, all provinces; MLTDB and MRTDB still in planning stage
Year	OTBD, 2006; PDB, 2006; PTDB, 2007; MLTDB, 2008 MRTDB, 2008
Occupations	PTDB - oncology; OT and PD - palliative care; MRTDB and MLTDB - area of practice and certification by discipline
Data	individual microdata
Demographic	YOB, gender
Geographic	province employed, rural/urban

Other Health Providers	11
Data Base Name	**Occupational Therapist (OTDB), Pharmacist (PDB), Physiotherapist (PTDB), Medical Lab Technologist (MLTDB), Medical Radiation Technologist (MRTDB)**
Education	level of basic and post-basic education, other education, grad yr,
Employment	place of employment, MRTDB includes cancer centre
Remuneration	No
Migration	track from place of education and place of work
Other	0.4% of 11,378 OT report palliative care; PDB - no oncology; PTDB - oncology as area of practice; MLTDB - diagnostic cytology and hematology; MRTDB - radiation therapy

Multiple Occupations	12
Data Base Name	**HR-PIS, now CWPT**
Purpose	to collect standardized data nationally from all cancer centres on supply of professionals and equipment, plus workload and demand for services
Coverage	pilot phase: collect data on 4 occupations (now 5)
Type	incomplete census, BC first, then SK in 2003, and Atlantic pilot around 2005
Year	2001- present with BC data
Occupations	medical oncologist, radiation oncologist, medical physicist, medical radiation therapist, dosimetrist
Data	aggregate data at cancer centre level
Demographic	5-yr age group, gender
Geographic	province and cancer centre
Education	length of service; country of accreditation
Employment	place of employment (cancer centre only), full-time, part-time, casual; active vs. on leave; FTE
Remuneration	employee, FFS, contract
Migration	No
Other	detailed data by centre on workload activity (e.g. new referrals by specialty); program data (e.g., systemic therapy IV chairs and beds, pharmacy) and number of RT courses, and RT equipment

Professional Organization	13	14
Data Base Name	**CARO, Canadian Association of Radiation Oncologists**	**CANO, Canadian Association of Nurses in Oncology**
Purpose	monitor supply and demand based on workforce and workload	monitor membership
Coverage	all radiation oncologists and residents in Canada, about 350 radiation oncologists projected to about 400 in 2011	about 950 nurses in oncology
Type	annual census	incomplete census
Year	late 1990s - present	late 1980s - present
Occupations	about 350 radiation oncologists and residents	nurses in oncology, may or may not have specialization
Data	aggregate data at cancer centre level	individual records
Demographic	5yr age group, gender	age, gender
Geographic	province, based on cancer centre	province, need to check on rural/urban
Education	tracks residents	education level; tracks certification
Employment	cancer centre, limited data on FTE	full-time/part-time; type of role; details on place of employment
Remuneration	No	No
Migration	not an issue as most stay in a centre, once hired	
Other	numbers on residency programs; expected retirements; workload by new patients, re-treatment and palliative; estimated positions needed/available	yrs of nursing and of oncology nursing practice; focus of care; other data

Other Sources	15	16	17
Data Base Name	**Census of Canada 2001**	**Labour Force Survey (monthly)**	**Canadian Community Health Survey (CCHS)**
Purpose	collect comprehensive information on Canadian society every 5 years	monitor labour force attachment of Canadian residents	collect information on health status of Canadians
Coverage	occupations are reported in the 20% sample	sample survey	sample survey
Type	20% sample		
Year	2006, 2001, 1996, 1991, etc	monthly	annual
Occupations	limited occupation breakdown	limited occupation breakdown	limited occupation breakdown
Data	microdata within STC	microdata within STC	microdata within STC
Demographic	age, gender	age, gender	age, gender
Geographic	province/territory of residence	province/territory of residence	province/territory of residence
Education	educational level	educational level	educational level
Employment	labour force status	labour force status	labour force status
Remuneration	income	?	income
Migration	some data	?	?
Other	residence of work	residence of work	other variables on health status, work stress, etc.

Table A1.3 – Cancer Workforce Scoping Study - Database Quality Assessment

		Quality Attributes								
		Coverage	Accuracy	Data items	Timeliness	Classifi-cations	Compre-hensive	Quality Assurance	Key Oncology Occupations	Overall
Data Base Name		Completeness of population covered	Data are validated and edited,	Completeness of data collected	Available within a useful time frame	Constancy of coding classifications	Range of data items collected	Data dictionary, methodology described, process	Identifiable?	Usefulness for cancer control
Physician Data										
1	National Physician Data base (NPDB)	**	***	**	**	**	***	***	***	***
2	Scotts Medical Database (SMB)	***	***	***	***	***	**	***	****	***
3	National Physician Survey	*	***	**	***	?	***	***	2004 only ****	***
4	CMA Master File									
5	Canadian Post-MD Education Registry	***	***	**	***	***	**	***	****	***
6	International Medical Graduates	not assessed								
Nurses Data										
7	Registered Nurses Database	***	****	***	***	***	**	****	**	**
8	Licensed Practical Nurses Database	***	****	***	***	***	**	****	*	*
9	Registered Psychiatric Nurses Database (RPDB)	not assessed as oncology is not an option							No	
10	National Survey of the Work and Health of Nurses (NSWHN)	***	****	****	***	***	****	****	**	**
Other Professional/Technical										
11	Occupational Therapist Data Base	****	***	***	***	***	***	***	**	**

		Quality Attributes								
		Coverage	Accuracy	Data items	Timeliness	Classifi-cations	Compre-hensive	Quality Assurance	Key Oncology Occupations	Overall
Data Base Name		Completeness of population covered	Data are validated and edited,	Completeness of data collected	Available within a useful time frame	Constancy of coding classifications	Range of data items collected	Data dictionary, methodology described, process	Identifiable?	Usefulness for cancer control
	(OTDB),									
12	Pharmacist Data Base (PDB),	**	***	***	***	***	**	***	No	*
	Note: other CIHI databases not assessed as no data collected as yet									
Multiple Occupations										
13	HR-PIS, now CWPT	**	**	**	**	**	****	**	****	**
Professional Organization										
14	CARO	***	**	***	***	**	*	*	****	**
15	CANO	**	not assessed				**		****	**
Other Sources										
16	Census of Canada 2001	****	**	***	**	***	**	****	**	**
17	Labour Force Survey (monthly)	****	***	**	****	***	**	****	**	**
18	CCHS	****	****	***	***	***	***	****	**	**

Quality Assessment Legend		
	****	excellent, exceeds normal standards
	***	good, meets normal standards
	**	fair, lacking in some areas
	*	poor, or no information available

Table A1.4 – Cancer Workforce Scoping Study – Plans, Gaps, Challenges and Opportunities for Databases,

	Data Base Name	Plans	Gaps	Challenges	Opportunities	Other
Physician Data						
1	National Physician Data base (NPDB)	develop data for alternative payment methods	non-FFS work; also radiology and lab info as these are block-funded	keeping good relations with provinces; exploring additional data items	physician level alternative payments	privacy issues
2	Scotts Medical Database (SMB)	obtain data on locums i.e., physicians covering for a practice; track uncertified specialists	no info on what physician is doing; only have obvious specialties for cancer work; no info on place of employment	data supplier has little interest in collecting additional items	a link to NPDB would help to understand reported vs working specialty and help with data quality	
3	National Physician Survey	hope to repeat in 2010; 2007 permission requested for cohort study ; consider option of a sample survey to improve response rate	response rate is low; disciplines not included in 2007 due to response time; definitions of alternative payment plans vary by province; need data on setting	response burden due to many physician surveys; need methods to study collaborative care	licensing bodies to conduct surveys; unique ID numbers assigned to all care providers not just physicians; link to master file to obtain setting	should look at liability/insurance issues when working in a team environment
4	CMA Master File				linkages	Master File links to CAPER for postgraduate information
5	Canadian Post-MD Education Registry	need data on distributed medical education; need to integrated under- and post- graduate databases	no info on distributed education (i.e., rotations in rural areas); no info on research funding; diversity (ethnic/cultural; SES; rural/urban	privacy concerns; lack of resources/skills to capture and submit data if additional items are needed	Health Canada funding to look at future of medical education, may include oncology training, national provider registry will be part of Canada Health Infoway, need common unique ID numbers,	MINC will help (Medical ID Number for Canada)
6	International Medical Graduates	not assessed				

	Data Base Name	Plans	Gaps	Challenges	Opportunities	Other
Nurses Data						
7	Registered Nurses Database	further develop information on nurse practitioners, including education specific to NP and type of NP practice	limited analysis on mobility; limited analysis of work/area of responsibility due to small cell values	lack of common national ID number; need ways to identify nurses working with cancer patients in all care settings		information is also collected through the National Survey of the Work and Health of Nurses
8	Licensed Practical Nurses Database	not specified	as above	as above		
9	Registered Psychiatric Nurses Database (RPDB)	NA	NA	NA	explore if psychiatric nurses do provide nursing care to cancer patients	
10	National Survey of the Work and Health of Nurses (NSWHN)	one-time survey	no salary information; how to capture data on all nurses caring for cancer patients	need to find ways to better characterize oncology nursing	good way to collect information that is not needed annually	does not give full picture of nurses who care for cancer patients
Other Professional/Technical						
11	Occupational Therapist (OTDB), Pharmacist (PDB), Physiotherapist (PTDB), Medical Lab Technologist (MLTDB), Medical Radiation Technologist (MRTDB)	current plans to get all 5 databases up and running and learn from initial data collection	some information such as workplace satisfaction or intent to retire is more appropriate for a survey; tracking migration	privacy challenges to collection 6 digit postal code, even though workplaces are generally public facilities	to explore databases specifically for oncology related data.	
Multiple Occupations						
12	HR-PIS,(now CWPT);	comprehensive evaluation of supply component, write up business architecture	needs to be more user-friendly; lack of standard definitions; cancer incidence and projection data not yet included?	hard to track positions not funded by cancer centres;	on-line version to input data; need $$ and/or dedicated human resources;	privacy concerns have led to aggregate data collection

	Data Base Name	Plans	Gaps	Challenges	Opportunities	Other
Professional Organizations						
13	CARO	need to formalize process (e.g., contract)	need to integrate with other databases, better predictive capacity	how to grow from a volunteer activity, workload data not public, avoid geographic comparisons re level of care	align with CPAC initiative and the RH and Standards Action Groups; Work with HR-PIS, continue to work on more relevant data	how to integrate data into a broader prediction effort
14	CANO	no plans, as recently updated membership form	workforce - who else is out there?, employment status	not considered	trends will be more evident with time	use the data more to see what they are telling us
Other Sources						
15	Census of Canada 2001	not assessed				
16	Labour Force Survey (monthly)	not assessed				
17	Canadian Community Health Survey	not assessed				

Appendix E: Key expert interview guides

Expert *(not involved with management of databases)* Consultations

Interview Guide

Introduction

- Introduce yourself and your role on the project.
- State why the respondent has been chosen: You have been selected as a respondent to this survey because of your expertise in human resource issues (data) relevant to cancer control (and as a result of a referral to us by Steering Committee member X or person Y.)
- Details of interview:
    - The Cancer Workforce Scoping Study aims to complete a pan-Canadian situational analysis and to develop a detailed research work plan for the cancer workforce. This work will be used by others to implement the research plan and ultimately to develop a human resource strategy for the cancer workforce.
    - We sent you a copy of the type of questions we would like to discuss with you and also, a list of occupations that are proposed to be studied in the pan-Canadian labour market study. **[Confirm receipt of interview guide and list of occupations]**
    - As indicated in our email to you, we are in the process of collecting and assessing the published and unpublished literature and data received to date and are now consulting with key experts in cancer care who have knowledge of human resources in the cancer control workforce, familiarity of the scientific and grey literature about human resources in cancer care, and familiarity with the databases and data existing for the cancer care workforce.
    - This is the purpose of our call and interview with you today.
    - The interview should take about 1 hour of your time. **[Confirm this is still a good time to conduct the interview]**
    - Stress confidentiality: Your responses will be strictly confidential and we will report your responses in a consolidated report with the results of the other consultations.

Do you have any questions before we proceed?

Section A: About the Cancer Workforce

1. Please tell me about your role in your organization and your background regarding research or data base management relevant to the cancer workforce.
   Probe: occupations studied; area of research expertise

2. What are the main human resource challenges you see facing the cancer workforce today?

3. What trends do you foresee in cancer workforce human resources over the next 5 years?

4. You have received a list of occupations we are considering as part of the pan-Canadian labour market study.
   - Are there any occupations missing from the list?
   - Are there any occupations you feel should be removed?

Section B: Availability of Literature and Data

5. Our goal is to learn about literature, reports and data that may be difficult for us to access through the standard medical literature.
   What reports are you aware of, particularly for your organization, that are related to the following topics? Are there other important reports in these areas we should be aware of?

   Note: we may wish to follow up with you to obtain a copy of these reports.

   HR issues:

   - Current trends in cancer
   - Health care economic and social policy trends
   - Cancer workforce demographics
   - Supply and demand
   - Retention issues and challenges
   - Recruitment issues and challenges
   - International graduates
   - Career pathing (incentives and disincentives)
   - Remuneration trends and models
   - Work organization (staffing, scope of practice, workplace satisfaction)
   - Models of care (service delivery models / teams)
   - Inter- and trans-disciplinary relationships/collaborations
   - Working conditions (job satisfaction, work – life balance)
   - Education (program availability; supply and demand of educators)
   - Training and professional development trends and initiatives

[Where possible, obtain copies of documents]

6. From your perspective, what gaps exist in the information and research you have available to you? In particular:
   - What information/research do you need that you do not have?
   - Considering the information/research available to you, what are the main ways in which it could be improved?
     Probe: completeness of information; dates; focus of information; gaps of information.

7. What are the challenges in obtaining the information that you need?

8. Thinking ahead over the next several years, what opportunities do you see that could help to overcome these challenges and enable you to obtain the information you need?

9. Are there other areas of research not included above that we should be considering?
   Probe: information and data available and where the gaps are.

Section C: Conducting a Pan-Canadian Labour Market Study of the Cancer Workforce

10. What do you see as challenges to undertaking a Pan-Canadian labour market study at this time?
    Probe: support from stakeholder groups; generation of missing data.
    Probe: challenges with some methods of collecting information

11. What opportunities do you see for undertaking such a study and to address some of the challenges?
    Probe: collaborating with existing research work, etc.
    Probe: advantages of employing some methods to collect information

12. Do you have any suggestions on how we might approach a Pan-Canadian labour market study?

13. Do you have any other comments to guide our work?

Conclusion

Thank you very much for your time and for the information you have provided.

Our next steps are to complete the consultations and the literature and data review and to prepare an interim report for the Steering Committee. We anticipate completing this work by November of this year.

If you would like any further information about the initiative you can contact Muneerah Kassam at 604.451.5757.

Expert *(involved with management of databases)* Consultations

Draft Interview Guide

Introduction

- Introduce yourself and your role on the project.

- State why the respondent has been chosen: You have been selected as a respondent to this survey because of your expertise in the XX data base and in human resource issues relevant to cancer control (and as a result of a referral to us by Steering Committee member X or person Y.) `

- Details of interview:
    - The Cancer Workforce Scoping Study aims to complete a pan-Canadian situational analysis and to develop a detailed research work plan for the cancer workforce. This work will be used by others to implement the research plan and ultimately to develop a human resource strategy for the cancer workforce.

    - We sent you a copy of the type of questions we would like to discuss with you and also, a list of occupations that are proposed to be studied in the pan-Canadian labour market study. **[Confirm receipt of interview guide and list of occupations]**

    - As indicated in our email to you, we are in the process of collecting and assessing the published and unpublished literature and data received to date and are now consulting with key experts in cancer care who have knowledge of human resources in the cancer control workforce, familiarity of the scientific and grey literature about human resources in cancer care, and familiarity with the databases and data existing for the cancer care workforce

    - This is the purpose of our call and interview with you today.

    - The interview should take about 1 hour of your time. **[Confirm this is still a good time to conduct the interview]**

    - Stress confidentiality: Your responses will be strictly confidential and we will report your responses in a consolidated report with the results of the other consultations.

Do you have any questions before we proceed?

Section A: About the Cancer Workforce

1. Please tell me about your role in your organization and your background regarding research or data base management relevant to the cancer workforce.
   Probe: occupations studied; area of research expertise

2. What are the main human resource challenges you see facing the cancer workforce today?

3. What trends do you foresee in cancer workforce human resources over the next 5 years?

4. You have received a list of occupations we are considering as part of the pan-Canadian labour market study.
   - Are there any occupations missing from the list?
   - Are there any occupations you feel should be removed?

Section B: Availability of Literature and Data

Our goal is to learn about literature, reports and data that may be difficult for us to access through the standard medical literature. Once again, we are focusing on collecting information for the following HR issues:

- Current trends in cancer
- Health care economic and social policy trends
- Cancer workforce demographics
- Supply and demand
- Retention issues and challenges
- Recruitment issues and challenges
- International graduates
- Career pathing (incentives and disincentives)
- Remuneration trends and models
- Work organization (staffing, scope of practice, workplace satisfaction)
- Models of care (service delivery models / teams)
- Inter- and trans-disciplinary relationships/collaborations
- Working conditions (job satisfaction, work – life balance)
- Education (program availability; supply and demand of educators)
- Training and professional development trends and initiatives

Where possible, obtain copies of documents

The next set of questions pertains to the database you are currently managing/working with.

5. What is the name of the database you manage or work with?

Obtain: Custodian organization (including web link)

Contact person and locators (name, address, e-mail, telephone and fax numbers (etc)

6. Please describe the purpose of the data base.

7. Please describe the type of data base in terms of:
    - Coverage
        i. For example: all radiation oncologists in Canada, or all members of the CARO, or all of occupation X, except Quebec, or all nurses in Canada
    - is it a sample survey or census?
    - year started
    - occupations included
    - any gaps such as provinces and territories included or not included?
        - individual microdata or aggregate

6. Please describe the data items included:
    - Demographics : Age, Gender
    - Geography: province employed; rural/urban
    - Education/Training: status; qualifications achieved
    - Employment status: part-time, full-time, retired, other leave
    - Place of employment: cancer centre, hospital, other institution, community, RHA
    - Remuneration: salary, Fee-For-Service, contract
    - Migration
    - Other items

7. What publications or reports include these data? Please send a list if possible.

8. What is the metadata available for the data base (i.e., the record layout, user guides, data dictionary, general descriptions, edits)? How may we receive a copy?

9. What basic tabulations are available?
   Probe: frequency tabulations to show content and completeness of main data items.

10. Please describe the type of quality assurance approach followed in particular, the policies and procedures? Is there a report on this we could obtain?

11. What is the management structure for the database?

12. Are there any plans to further develop the data base?
    - If yes, can you discuss in what way and the timelines?

13. From your perspective, what gaps exist in the database?

14. What are the challenges in addressing these gaps?

15. Thinking ahead over the next several years, what opportunities do you see that could help to overcome these challenges and enable you to obtain the information you need?

16. Are there other areas of research that we should be considering?
   Probe: information and data available and where the gaps are.

Section C: Conducting a Pan-Canadian Labour Market Study of the Cancer Workforce

17. What do you see as challenges to undertaking a Pan-Canadian labour market study at this time?
    Probe: support from stakeholder groups; generation of missing data.
    Probe: challenges with some methods of collecting information

18. What opportunities do you see for undertaking such a study and to address some of the challenge?
    Probe: collaborating with existing research work, etc.
    Probe: advantages of employing some methods to collect information

19. Do you have any suggestions on how we might approach a Pan-Canadian labour market study?

20. Do you have any other comments to guide our work?

Conclusion

Thank you very much for your time and for the information you have provided.

Our next steps are to complete the consultations and the literature and data review and to prepare an interim report for the Steering Committee. We anticipate completing this work by November of this year.

If you would like any further information about the initiative you can contact Muneerah Kassam at 604-451-5757.

Appendix F: Distribution of participants consulted for the CWSS

List of Participating Organizations

Organization	Region
Professions	
Medical Oncology	
BC Cancer Agency	BC
Cancer Care Manitoba	MB
Cancer Care Ontario	ON
Radiation Therapist	
BC Cancer Agency	BC
Cancer Care Manitoba	MB
CAMRT	National
The Ottawa Hospital	ON
Radiation Oncology	
BC Cancer Agency	BC
New Brunswick Cancer Network	NB
Medical Physicist	
BC Cancer Agency	BC
Dr Leon-Richard Oncology Centre	NB
Saint John Regional Hospital	NB
Eastern Health Cancer Program	NL
Ottawa Hospital	ON
University Health Network	ON
PEI Cancer Treatment Centre	PEI
Pathologist	
University Health Network	ON
Palliative Care Physician	
Pallium Project	AB
Palliative Care Program	PEI
GP/FP	
Cancer Care Manitoba	MB
Dryden Regional Hospital and Family Health Centre	ON
Juravinski Cancer Centre	ON
Oncology Nurse	
Hopital Charles-Lemoyne	QC
Dryden Regional Hospital and Family Health Centre	ON

List of Participating Organizations

Organization	Region
Nurse Practitioners/APNs	
Royal Victoria Hospital	ON
Ottawa General Hospital	ON
Provincial Cancer Agencies or Programs	
BC Cancer Agency	BC
Alberta Cancer Board	AB
Cancer Care Manitoba	MB
Cancer Care Ontario	ON
The Quebec Centre of Cancer Control	QC
Cancer Care Nova Scotia	NS
PEI Cancer Treatment Centre	PEI
New Brunswick Cancer Network	NB
Eastern Health Cancer Program	NL
Educational institutions	
CMA Conjoint Accreditation Committee	National
Canadian College of Physicists in Medicine	ON
BC Academic Health Council	BC
BC Institute of Technology, School of Rad. Therapy	BC
Fraser Health Authority	BC
University of Western Ontario	ON
Manitoba School of Radiation Therapy	MB
McMaster University	ON
Michener Institute	ON
University of ON Institute of Technology	ON
University of Toronto	ON
Lakehead University	ON
Patients	
Patient Advocate Group	SK
SK Cancer Action Network	SK
Researchers and Planners	
Cancer Care Manitoba	MB
Cdn Strategy for Cancer Control, BC/YK	BC
BC Cancer Agency	BC
Other	
Canadian Association of Psychosocial Oncology	National

List of Participating Organizations

Organization	Region
Thunder Bay, Director of Communications	ON
Dryden Hospital and Family Health Centre (Pharmacist)	ON
Thunder Bay	
Occupation	
Nurse Educator	ON
Director Supportive Care	ON
Communications Department	ON
Director Preventive Oncology	ON
VP Patient Services	ON
Supportive Care	
Chaplain	ON
Counsellor, supportive care	ON
Oncology nurse	ON
Supportive care	ON
Director Supportive Care	ON
Research Radiation Therapist	ON
Tobacco Treatment Specialist	ON
Supportive care	ON
Prevention & Aboriginal Focus Group	
First Nations & Inuit Health, HC	ON
Screening Coordinator	ON
Director Preventive Oncology	ON
Consultant, Ontario Breast Cancer Information Exchange	ON
Interprofessional Education Focus Group	
Dean, Professional Schools	ON
Occupational Therapist, NOSM	ON
Nurse	ON
Director, School of Nursing	ON
Dryden	
Community Network Focus Group	
Social worker	ON
Pharmacy technician	ON
Pharmacy technician (3rd day on job)	ON
FP, Oncology	ON
Pharmacist	ON
Oncology nurse	ON

List of Participating Organizations

Organization	Region
Director Patient Care	ON
Supportive care	ON
Cancer Care Manitoba	
Community Cancer Program Network Focus Group	
Community Liaison Nurse	MB
Program Director	MB
Program Administrator	MB
Saint John Regional Hospital	
Nurses Focus Group	
Radiation Therapy Nurse	NB
Clinical Onc Resource Nurse	NB
Onc Nurse	NB
Palliative Care Nurse	NB
Pediatric Onc Nurse	NB
RN, Nurse Manager	NB
Medical Physicist/Dosimetrist Focus Group	
Medical Physicist	NB
Dosimetrist	NB
Radiation Therapy Focus Group	
Radiation Therapist	NB

Appendix G: Interview guides for educators, managers, professions and cancer agencies

Component 3: Human Resources Challenges and Trends

Interview Guide – Educators

Introduction

- *Introduce* yourself and your role on the project.

- *Details* about project:
    - The Cancer Workforce Scoping Study aims to complete a pan-Canadian situational analysis and to provide information and recommendations that will lead into the development of action for human resources in cancer control. The intention is to provide the much needed information and suggested actions to stakeholder groups in cancer control.

- *Purpose of interview*: As indicated in our email to you, we are in the process of conducting interviews and site visits across Canada and including a number of different stakeholder groups in cancer control such as educators, cancer care providers, cancer agencies, patients, researchers, and provincial/territorial governments. We would like to discuss with you the changes or planned changes to programs, challenges, issues with enrolments, and the integration of IPE into programs.

    - The interview should take about 30 minutes of your time. **[Confirm this is still a good time to conduct the interview]**

    - Stress *confidentiality*: Your responses will be strictly confidential and we will report your responses in a consolidated report with the results of the other consultations.

Do you have any *questions* before we proceed?

1. Please tell me about your background and role in your organization.

About the educational program

2. How has the program evolved or changed over the last five years and what have been the main challenges?
   Probe: impetus for changes; challenges with enrolments and completion rates; enrolment patterns (i.e., increases/decreases); enrolments of international students.

3. How will the program(s) change in the next few years if at all?
   Probe: impetus for changes

4. What do you believe will be the implications of these issues and trends on the program(s) and workforce?

5. Thinking about a cancer focus:

   - What are the issues/challenges in terms of including a focus on oncology/cancer in your program? (especially for occupations that are not cancer-specific)

6. Thinking about where we can aspire to get to:

   i) Thinking beyond your specific program, what trends do you see occurring over the next 5 to 10 years in health workforce education that would have an impact on your program?
   ii) In your view, what would an ideal education program look like in five to ten years?
   iii) What is needed to be put into place to get there?

Inter-professional Education

7. How has Inter-professional Education (IPE) been integrated into the program if at all? If it has not been integrated, why not and are there plans to integrate IPE?
   Probe: training current faculty members have taken if required at all.

8. What have been the benefits of integrating IPE into the program?

9. What are the challenges of integrating IPE?

Faculty

10. Is the availability of faculty an issue for your program?
    Probe: what are the issues.

11. What are some of the challenges you anticipate in the next five years with respect to having faculty for the program? the development (training and education) of faculty?
    Probe: recruitment, experienced faculty, time availability to teach, research and practice, remuneration.

12. What development opportunities are currently provided to faculty to maintain their knowledge and skills?

Successful examples

13. Can you identify and elaborate on any new approaches and/or examples that have been implemented in education to address any of the challenges you outlined above?
    Probe: location, what was the challenge/situation to warrant the solution; can this be applied elsewhere?

General

14. What are the main human resource challenges you see facing the cancer workforce today?
    Probe: implications to education.

15. What trends do you foresee in cancer workforce human resources over the next 5 years.
    Probe: implications to education.

Conclusion

16. Do you have any other comments to guide our work?

17. Is there any literature you would recommend or can provide us that would be beneficial to our work?

Obtain electronic copies wherever possible.

Thank you very much for your time and for the information you have provided.

Our next steps are to complete the consultations and site visits and to prepare the situational analysis and final reports for the Steering Committee. We anticipate completing this work by June of this year.

If you would like any further information about the initiative you can contact Muneerah Kassam at 604.786.9201.

Component 3: Human Resources Challenges and Trends

Interview Guide – Managers and Supervisors

Introduction

- *Introduce* yourself and your role on the project.

- *Details* about project:
    - The Cancer Workforce Scoping Study aims to complete a pan-Canadian situational analysis and to provide information and recommendations that will lead into the development of an action for human resources in cancer control. The intention is to provide the much needed information and suggested actions to stakeholder groups in cancer control.

Purpose of interview: As indicated in our email to you, we are in the process of conducting interviews and site visits across Canada and including a number of different stakeholder groups in cancer control such as educators, cancer care providers, cancer agencies, patients, researchers, and provincial/territorial governments. We would like to discuss with you the human resources issues, challenges and trends in cancer control.

- The interview should take about 30 minutes of your time. **[Confirm this is still a good time to conduct the interview]**

- Stress *confidentiality*: Your responses will be strictly confidential and we will report your responses in a consolidated report with the results of the other consultations.

Do you have any *questions* before we proceed?

General

1. Please tell me about your work and your role in cancer control.
   Probe: collaboration within cancer control team; amount of time spent in cancer care; technology used.

Changes to occupation and work place

2. How has your work changed in the last couple of years?
   Probe: impetus for changes; role within cancer control team; technological changes; work place changes; collaborative team approaches.

3. What implications has this had for you?
   Probe: new knowledge and skills acquired; changes within cancer control team.

4. In your opinion, how will your work change in the next few years if at all?
   Probe: impetus for changes; changes within cancer control team; technological changes; work place changes; collaborative team approaches.

5. What do you believe will be the implications of these changes for you and for the overall care provided?

6. What is working well for you right now?

Challenges

7. What are the overall challenges facing you in your current position? (e.g. rising incidence, prevalence, advances in technology, funding, and shortages)

8. What are some of the factors that influence the decisions taken with respect to managing and supervising staff?

9. In what areas do you face the greatest pressures?

10. What would help ease the pressure?

Conclusion

11. Thinking about where we can aspire to get to:
    - What would an ideal work place look like in five to ten years?
    - What is needed to be put into place to get there?

12. Do you have any other comments to guide our work?

Thank you very much for your time and for the information you have provided.

Our next steps are to complete the consultations and site visits and to prepare the situational analysis and final reports for the Steering Committee. We anticipate completing this work by June of this year.

If you would like any further information about the initiative you can contact Muneerah Kassam at 604. 786.9201.

Component 3: Human Resources Challenges and Trends

Interview Guide – Professions

Introduction

- *Introduce* yourself and your role on the project.

- *Details* about project:
    - The Cancer Workforce Scoping Study aims to complete a pan-Canadian situational analysis and to provide information and recommendations that will lead into the development of action for human resources in cancer control. The intention is to provide the much needed information and suggested actions to stakeholder groups in cancer control.

Purpose of interview: As indicated in our email to you, we are in the process of conducting interviews and site visits across Canada and including a number of different stakeholder groups in cancer control such as educators, cancer care providers, cancer agencies, patients, researchers, and provincial/territorial governments. We would like to discuss with you the human resources issues, challenges and trends for the profession in cancer control.

- The interview should take about 30 minutes of your time. **[Confirm this is still a good time to conduct the interview]**

- Stress *confidentiality*: Your responses will be strictly confidential and we will report your responses in a consolidated report with the results of the other consultations.

Do you have any *questions* before we proceed?

General

1. Please tell me about your work and your role in cancer control.
   Probe: collaboration within cancer control team; amount of time spent in cancer care; technology used.

Changes to occupation and work place

2. How has your work changed in the last couple of years?
   Probe: impetus for changes; role within cancer control team; technological changes; work place changes; collaborative team approaches.

3. What implications has this had for you?
   Probe: new knowledge and skills acquired; changes within cancer control team.

4. What is working well right now?

5. In your opinion, how will your work change in the next few years if at all?
   Probe: impetus for changes; changes within cancer control team; technological changes; work place changes; collaborative team approaches.

6. What do you believe will be the implications of these changes for you and for the overall care provided?

Challenges

7. What are the overall challenges facing you in your current position?
   (e.g. rising incidence, prevalence, advances in technology, funding, and shortages)

8. In what areas do you face the greatest pressures?

9. What would help ease the pressure?

Conclusion

10. Thinking about where we can aspire to get to:
    - What would an ideal work place look like in five to ten years
    - What is needed to be put into place to get there?

11. Do you have any other comments to guide our work?

Thank you very much for your time and for the information you have provided.

Our next steps are to complete the consultations and site visits and to prepare the situational analysis and final reports for the Steering Committee. We anticipate completing this work by June of this year.

If you would like any further information about the initiative you can contact Muneerah Kassam at 604. 786.9201.

Component 3: Human Resources Challenges and Trends

Interview Guide – Provincial Cancer Agencies

Introduction

- *Introduce* yourself and your role on the project.

- *Details* about project:
    - The Cancer Workforce Scoping Study aims to complete a pan-Canadian situational analysis and to provide information and recommendations that will lead into the development of an action for human resources in cancer control. The intention is to provide the much needed information and suggested actions to stakeholder groups in cancer control.

Purpose of interview: As indicated in our email to you, we are in the process of conducting interviews and site visits across Canada and including a number of different stakeholder groups in cancer control such as educators, cancer care providers, cancer agencies, patients, researchers, and provincial/territorial governments. We would like to discuss with you the human resources issues, challenges and trends in cancer control and in particular, the challenges facing cancer agencies.

- The interview should take about 30 minutes of your time. **[Confirm this is still a good time to conduct the interview]**

- Stress *confidentiality*: Your responses will be strictly confidential and we will report your responses in a consolidated report with the results of the other consultations.

Do you have any *questions* before we proceed?

General

1. Please tell me about your program area and your role in the agency.

Changes to occupation and work place

2. How has cancer care changed/evolved over the last several years in your program area?
   Probe: impetus for changes; role within cancer control team; technological changes; work place changes; collaborative team approaches.

3. What implications has this had for the workforce in your program area?
   Probe: new knowledge and skills acquired; changes within cancer control team.

4. In your opinion, how will cancer care in your program area change in the next few years if at all?
   Probe: impetus for changes; changes within cancer control team; technological changes; work place changes; collaborative team approaches.

5. What do you believe will be the implications of these changes for workforce?

Challenges

6. What are the overall challenges facing your program in the cancer agency? (e.g. rising incidence, prevalence, advances in technology, funding, and shortages)

7. How are these being addressed?

8. In what areas do you face the greatest pressures?

9. What would help ease the pressure?

Conclusion

10. Thinking about where we can aspire to get to:
    - What would the ideal work place and cancer care in your program area look like in five to ten years?
    - What is needed to be put into place to get there?

11. Do you have any other comments to guide our work?

Thank you very much for your time and for the information you have provided.

Our next steps are to complete the consultations and site visits and to prepare the situational analysis and final reports for the Steering Committee. We anticipate completing this work by June of this year.

If you would like any further information about the initiative you can contact Muneerah Kassam at 604. 786.9201.

Component 3: Human Resources Challenges and Trends

Interview Guide – Patients

Introduction

- *Introduce* yourself and your role on the project.

- *Details* about project:
    - The Cancer Workforce Scoping Study aims to complete a pan-Canadian situational analysis and to provide information and recommendations that will lead into the development of action for human resources in cancer control. The intention is to provide the much needed information and suggested actions to stakeholder groups in cancer control.

Purpose of interview: As indicated in our email to you, we are in the process of conducting interviews and site visits across Canada and including a number of different stakeholder groups in cancer control such as educators, cancer care providers, cancer agencies, patients, researchers, and provincial/territorial governments. We would like to discuss with you the changes in care provided, challenges for patients, and suggestions for enhancements in the care provided.

- The interview should take about 30 minutes of your time. **[Confirm this is still a good time to conduct the interview]**

- Stress *confidentiality*: Your responses will be strictly confidential and we will report your responses in a consolidated report with the results of the other consultations.

Do you have any *questions* before we proceed?

General

1. Please tell me about your work and your role in cancer control.

Changes in care provided

2. How has the cancer care provided evolved in the last couple of years?
   Probe: impetus for changes; role within cancer control team; technological changes; work place changes; collaborative team approaches.

3. What implications has this had for patients?

4. In your opinion, what further changes are expected in the next few years if at all?
   Probe: impetus for changes; changes within cancer control team; technological changes; work place changes; collaborative team approaches.

5. What do you believe will be the implications of these changes for patients?

Challenges

6. What are the challenges patients face in accessing and receiving care?

7. In what areas do they face the greatest pressures?

8. What would help ease the pressure?

9. What has been working well? How can it be enhanced?

Conclusion

10. Thinking about where we can aspire to get to, what would an ideal care environment look like in five to ten years?
    - What is needed to be put into place to get there?

11. Do you have any other comments to guide our work?

Thank you very much for your time and for the information you have provided.

Our next steps are to complete the consultations and site visits and to prepare the situational analysis and final reports for the Steering Committee. We anticipate completing this work by June of this year.

If you would like any further information about the initiative you can contact Muneerah Kassam at 604. 786.9201.

Appendix H: Interview guides for focus groups

Component 3: Human Resources Challenges and Trends

Site Visits: Focus Group – Cross Section of Disciplines

Introduction

- *Introduce* yourself and your role on the project.

- *Details* about project:
    - The Cancer Workforce Scoping Study aims to complete a pan-Canadian situational analysis and to provide information and recommendations that will lead into the development of action for human resources in cancer control. The intention is to provide the much needed information and suggested actions to stakeholder groups in cancer control.

- *Purpose of focus group*: We are in the process of conducting interviews and site visits across Canada and including a number of different stakeholder groups in cancer control such as educators, cancer care providers, cancer agencies, patients, researchers, and provincial/territorial governments. We would like to discuss with you the human resources issues, challenges and trends for the profession in cancer control.

    - The focus group should take about 60 minutes of your time.

    - Stress *confidentiality*: Your responses will be strictly confidential and we will report your responses in a consolidated report with the results of the other consultations.

    - Advise if recording and ask if anyone is not comfortable with this.

- **Ask to complete the attendance sheet: print name, organization and sign, phone number and email?**

Do you have any *questions* before we proceed?

1. Roundtable: briefly tell us about your work and your role on the cancer care/control/oncology team/community network.

Challenges and trends

2. What are or have been the challenges facing you in your work (with respect to ensuring quality care is delivered) and as part of the cancer care/control/oncology team/community network? Probe specifically to aboriginal/rural/remote issues

3. What implications has this had for you?

4. How will your work and the way care will be delivered by your program change in the next few years?

Successful and/or innovative practices

5. What is working well right now regarding how you/your program deliver care/ cancer control programs?

Conclusion

6. Thinking about where we can aspire to get to:
    - What would an ideal work place look like in five to ten years?
    - What is needed to be put into place to get there?

Thank you very much for your time and for the information you have provided.

Our next steps are to complete the consultations and site visits and to prepare the situational analysis and final reports for the Steering Committee. We anticipate completing this work by June of this year.

Component 3: Human Resources Challenges and Trends

Site Visits: Focus Group – Educational Institutions

Introduction

- *Introduce* yourself and your role on the project.

- *Details* about project:
    - The Cancer Workforce Scoping Study aims to complete a pan-Canadian situational analysis and to provide information and recommendations that will lead into the development of action for human resources in cancer control. The intention is to provide the much needed information and suggested actions to stakeholder groups in cancer control.

- *Purpose of focus group*: We are in the process of conducting interviews and site visits across Canada and including a number of different stakeholder groups in cancer control such as educators, cancer care providers, cancer agencies, patients, researchers, and provincial/territorial governments. We would like to discuss with you the changes or planned changes to programs, challenges, issues with enrolments, and the integration of IPE into programs.

    - The focus group should take about 60 minutes of your time.

    - Stress *confidentiality*: Your responses will be strictly confidential and we will report your responses in a consolidated report with the results of the other consultations.

    - Advise if recording and ask if anyone is not comfortable with this.

- **Ask to complete the attendance sheet: print name, organization and sign.**

Do you have any *questions* before we proceed?

1. Roundtable: briefly tell us about your program and how it has evolved or changed over the last couple of years.
   Probe: impetus for changes; challenges with enrolments and completion rates; enrolment patterns (i.e., increases/decreases); enrolments of international students.

Challenges

2. What have been the main challenges for the program in the last couple of years?
   Probe: recruitment and retention of faculty; enrolment; getting more seats; getting clinical placements; leadership training.

Trends

3. What trends do you see occurring over the next 5 to 10 years in health workforce education that would have an impact on your program? How will the program(s) change? **Probe:** clinical simulation; technological advancements; innovative learning delivery

Inter Professional Education

4. How has Inter-professional Education (IPE) been integrated into the program if at all? If it has not been integrated, why not and are there plans to integrate IPE?
   Probe: training current faculty members have taken if required at all.

5. What are the challenges of integrating IPE?

Conclusion

6. Thinking about where we can aspire to get to:
   - In your view, what would an ideal education program look like in five to ten years?
   - What is needed to be put into place to get there?

Thank you very much for your time and for the information you have provided.

Our next steps are to complete the consultations and site visits and to prepare the situational analysis and final reports for the Steering Committee. We anticipate completing this work by June of this year.

Component 3: Human Resources Challenges and Trends

Site Visits: Focus Group – IPE

Introduction

- *Introduce* yourself and your role on the project.

- *Details* about project:
    - The Cancer Workforce Scoping Study aims to complete a pan-Canadian situational analysis and to provide information and recommendations that will lead into the development of action for human resources in cancer control. The intention is to provide the much needed information and suggested actions to stakeholder groups in cancer control.

- *Purpose of focus group*: We are in the process of conducting interviews and site visits across Canada and including a number of different stakeholder groups in cancer control such as educators, cancer care providers, cancer agencies, patients, researchers, and provincial/territorial governments. We would like to discuss with you the integration of IPE into the health sciences programs.

    - The focus group should take about 60 minutes of your time.

    - Stress *confidentiality*: Your responses will be strictly confidential and we will report your responses in a consolidated report with the results of the other consultations.

    - Advise if recording and ask if anyone is not comfortable with this.

- **Ask to complete the attendance sheet: print name, organization, telephone number and e-mail address, and sign.**

Do you have any *questions* before we proceed?

Challenges

1. Discuss the IPE program and its integration within the health sciences programs.
   Probe: how leadership training is incorporated into the programs; how clinical placements are evolving.

2. What have been the main challenges for the program? and challenges to its integration?
   Probe: recruitment and retention of faculty; enrolment; getting clinical placements; leadership training.

Trends

3. What is working well with the program?

4. Where can improvements be made? And why?

5. What trends do you see occurring over the next 5 to 10 years in health workforce education that would have an impact on your program? How will the program(s) change? Probe: clinical simulation; technological advancements; innovative learning delivery

Conclusion

6. Thinking about where we can aspire to get to:
    - In your view, what would the ideal IPE program look like in five to ten years?
    - What is needed to be put into place to get there?

Thank you very much for your time and for the information you have provided.

Our next steps are to complete the consultations and site visits and to prepare the situational analysis and final reports for the Steering Committee. We anticipate completing this work by June of this year.

Component 3: Human Resources Challenges and Trends

Site Visits: Focus Group – Managers and Supervisors

Introduction

- *Introduce* yourself and your role on the project.

- *Details* about project:
    - The Cancer Workforce Scoping Study aims to complete a pan-Canadian situational analysis and to provide information and recommendations that will lead into the development of action for human resources in cancer control. The intention is to provide the much needed information and suggested actions to stakeholder groups in cancer control.

- *Purpose of focus group*: We are in the process of conducting interviews and site visits across Canada and including a number of different stakeholder groups in cancer control such as educators, cancer care providers, cancer agencies, patients, researchers, and provincial/territorial governments. We would like to discuss with you the human resources issues, challenges and trends in cancer control.

    - The focus group should take about 60 minutes of your time.

    - Stress *confidentiality*: Your responses will be strictly confidential and we will report your responses in a consolidated report with the results of the other consultations.

    - Advise if recording and ask if anyone is not comfortable with this.

- **Ask to complete the attendance sheet: print name, organization and sign.**

Do you have any *questions* before we proceed?

1. Roundtable: briefly tell us about your work and role in cancer control.

Challenges

2. In what areas do you face the greatest pressures?
   (e.g. rising incidence, prevalence, advances in technology, funding, and shortages)

3. What would help ease the pressure?

Trends

4. How will the way care provided change in the next few years if at all and what will it mean for you and the workforce?

Multi-disciplinary teams

5. How are multi-disciplinary teams enhancing the quality of care provided? What are/have been the challenges of multi-disciplinary teams?

Conclusion

6. Thinking about where we can aspire to get to:
    - What would an ideal work place look like in five to ten years?
    - What is needed to be put into place to get there?

Thank you very much for your time and for the information you have provided.

Our next steps are to complete the consultations and site visits and to prepare the situational analysis and final reports for the Steering Committee. We anticipate completing this work by June of this year.