

The British Columbia Cancer Agency: A Comprehensive and Integrated System of Cancer Control

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This article describes progress being made towards developing a comprehensive and integrated system of cancer control in British Columbia. It includes a description of the role of the BC Cancer Agency, its history, how and why it decided to move in this direction, as well as the reasons for recent changes, further improvements that are needed and some of the lessons that have been learned.

CANADIAN CONTEXT

A brief comment about cancer control in Canada provides a useful context. Seven out of 10 of Canada's provinces have formally structured cancer control agencies, most of which have a responsibility for a system of cancer control. Agency activities are generally directed towards similar missions that include:

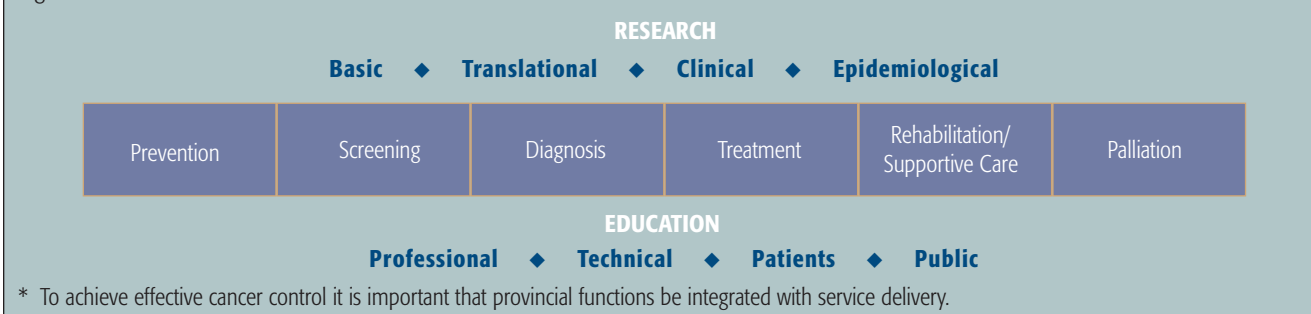
- Reducing the incidence of cancer.
- Reducing mortality from cancer.
- Improving the quality of life of those living with cancer.

A few decades ago, most provincial cancer agencies were devoted to clinic-based, modality-oriented treatment such as radiation and systemic therapy. There has been gradual progression towards developing population-based systems of cancer control along with geographically distributed services, including networks and linking systems to achieve consistent patient-centred, evidence-based care. Many of the provinces have cancer acts that clearly define these responsibilities. Those without cancer acts have government-approved

mandates established under provincial societies acts or other enabling legislation (Carlow, in press). However, there continues to be variation in the extent to which cancer agencies have adopted this full population-based mandate as well as variations in the level of integration. Some provinces, for example, do not have the cancer registry integrated with a provincial system, and in some, screening programs have either not developed or lie outside the system. In some cases there has not been full integration of other elements of cancer control such as surgery (Hayter 1998), rehabilitation and palliative care. Further work is also needed on standard setting, diffusion and linking systems. Having said this, there has been significant movement towards the fuller realization of comprehensive and integrated systems, and this is occurring at an increasing rate.

These arrangements in the various provinces, however, are unique in comparison to the rest of the world. It is of interest that many countries have developed cancer strategies including goals and targets to reduce the burden of this disease (Bennett et al. n.d.), but few have any existing well-developed systems to enable implementation. For Canada, developing a national strategy with clear goals and specific directions linked to provincial cancer agency systems provides an unparalleled opportunity for a model system for cancer control delivery with a potential for even more favourable outcomes compared to the rest of the world. The population-based disease control model as exemplified by organized cancer systems may have applicability to other aspects of healthcare.

Figure 1: **PROVINCIAL CANCER CONTROL FUNCTIONS**



THE BC SYSTEM

Cancer control in British Columbia has progressed very significantly towards the realization of a comprehensive population-based integrated system. It is characterized by:

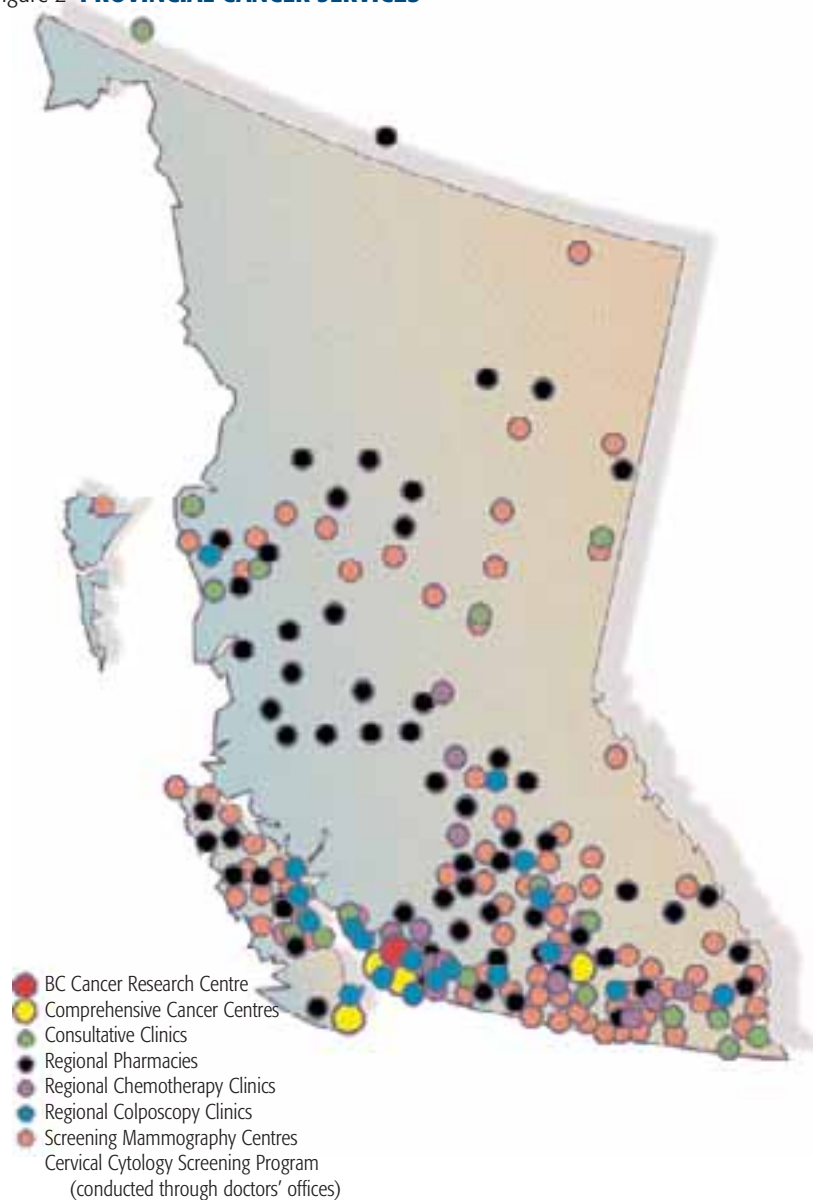
- A broad-based mandate including all elements of cancer control.
- A geographically-distributed network of services.
- Connection through standards, programs, processes and support systems.

Its government-approved mandate encompasses prevention, screening, diagnosis, treatment, rehabilitation/supportive care, palliation, professional, technical, patients and public education as well as research in basic, translational, clinical and epidemiological sciences (Figure 1). Its goal is to generate, synthesize and apply knowledge to the cancer control spectrum to achieve the elements of the mission previously described. The Agency carries out its mandate in partnership with many organizations, including the Canadian Cancer Society (British Columbia & Yukon Division), the BC Cancer Foundation, the provincial regional health authorities, the University of British Columbia and other cancer-related organizations/charitable foundations.

The Agency operates this system through a geographically distributed and connected network of services (Figure 2). This includes:

- A major cancer research centre.
- Four comprehensive cancer centres strategically located throughout the province.
- Seventeen co-managed systemic therapy clinics.
- Unifying provincial programs in radiation, systemic and surgical oncology.

Figure 2 **PROVINCIAL CANCER SERVICES**



- Provincial programs and networks in cancer rehabilitation and palliative care.
- A provincial screening program with over 30 sites and three mobile vans.
- A provincial cervical cytology program including 23 regional colposcopy clinics for follow-up.
- Consultative outreach clinics in 20 locations.

The entire system is connected through a number of organizational, information system and communication linkages including:

- Tumour groups, which determine provincial standards for managing specific forms of cancer. Standards are disseminated widely throughout the province with a comparatively high level of compliance.
- Provincial programs and networks that have developed common processes for care and service delivery throughout the provincial system.
- A provincial cancer registry, in existence since 1969, that provides comprehensive data on many aspects of the province's performance in cancer control, with 97% of all cancer cases registered. Data generated provides the statistical basis for planning of programs and services and for

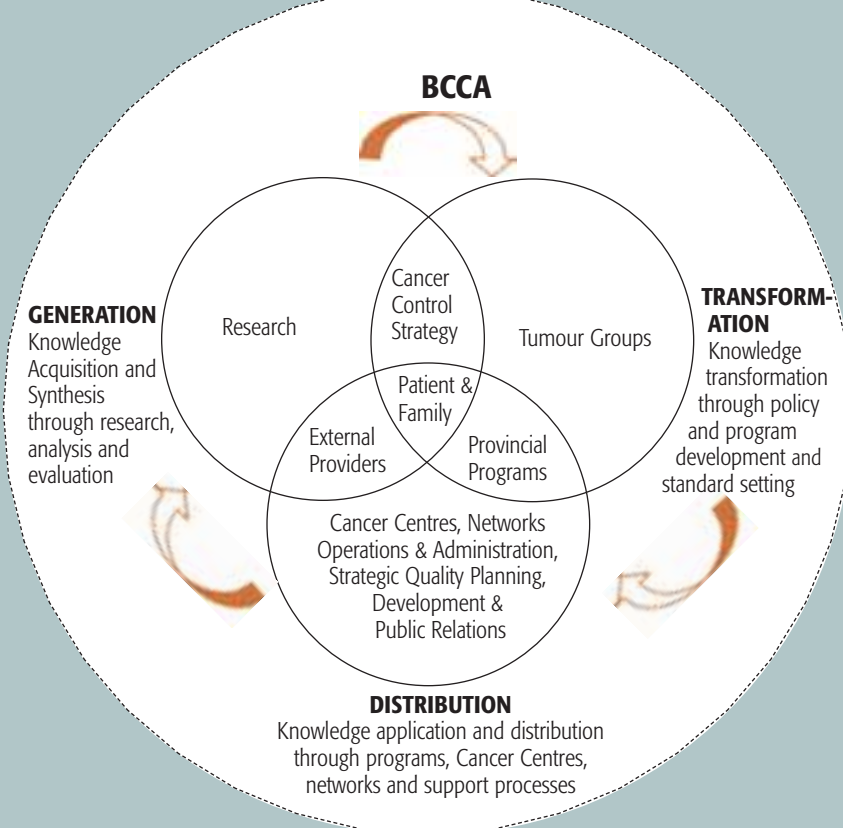
monitoring/surveillance of overall performance.

- Professional practice leaders for all of the oncology-related disciplines, who have a provincial responsibility for establishing and maintaining professional standards and working together to ensure a full understanding of professional relationships.
- Connecting systems for provincial planning, information management/information technology, human resources and finance.
- A well-developed videoconferencing system that provides the opportunity for meetings and conferences, both patient and non-patient related.
- Agency coordination of its activities province-wide from the point of entry into care – encompassing the whole care experience through community-based cancer care teams, as well as regional cancer advisory committees in five geographic areas of the province chaired by trustees who are also members of the Agency's board.

The BC Cancer Agency system of cancer control strives to link cancer research to cancer control standards, policy and program development and ultimately consistent evidence-based service delivery as depicted in Figure 3, and similar to

the National Cancer Institute of Canada (1994) cancer control framework. The Agency's goal is to tie together an entire system of cancer control to meet the needs of the population, based on the premise that the organization and design of the overall cancer control delivery system is key to improving survival and reducing mortality. This is based on the idea that the consistent delivery of evidence-based care drives down mortality and improves survival (Junor et al. 1994; Smith 1994; McKay and Langlands 1990; Stiller 1995; Wagner et al. 1995; Lennox et al. 1979; Kramer et al. 1984; Stiller and Draper 1989; Collette et al. 1999; Spurgeon et al. 2000;

Figure 3: **RESEARCH TO POLICY TO PRACTICE**



Stiller 1989). It is the opinion of the BC Cancer Agency that any cancer control strategy must address the overall organization of cancer control service delivery.

HISTORY OF THE BC CANCER AGENCY

In 1935 a special committee of the BC Medical Association was formed to investigate what could be done about the growing incidence of cancer and the lack of facilities to combat this disease. As a consequence, the British Columbia Cancer Foundation was incorporated under the Societies Act. The Foundation established a treatment centre in Vancouver, called the British Columbia Cancer Institute, where 288 patients were treated in 1938, its first year of operation.

Over the next two decades, a centre opened in Victoria, consultative clinics opened in Penticton, Kelowna, Vernon and Kamloops, training programs were introduced for radiotherapy technicians, new facilities were built to house modern radiation therapy equipment and a cervical screening program was launched in 1956. The BC Cancer Registry was established in 1969. In 1974 the Foundation made arrangements with the Ministry of Health to create a comprehensive provincial program in cancer control called the Cancer Control Agency of British Columbia (CCABC). The BC Cancer Foundation became the fund-raising organization for the Agency, but maintained ownership of the BC Cancer Research Centre, which is now operated under contract by the BC Cancer Agency to ensure an integrated program of cancer control. Additional chemotherapy clinics and consultative clinics were opened, the Screening Mammography Program was established, a new Vancouver centre opened with a capacity of 100 inpatient beds including two operating rooms and expanded clinical services, and the centre in Victoria moved into a new free-standing facility.

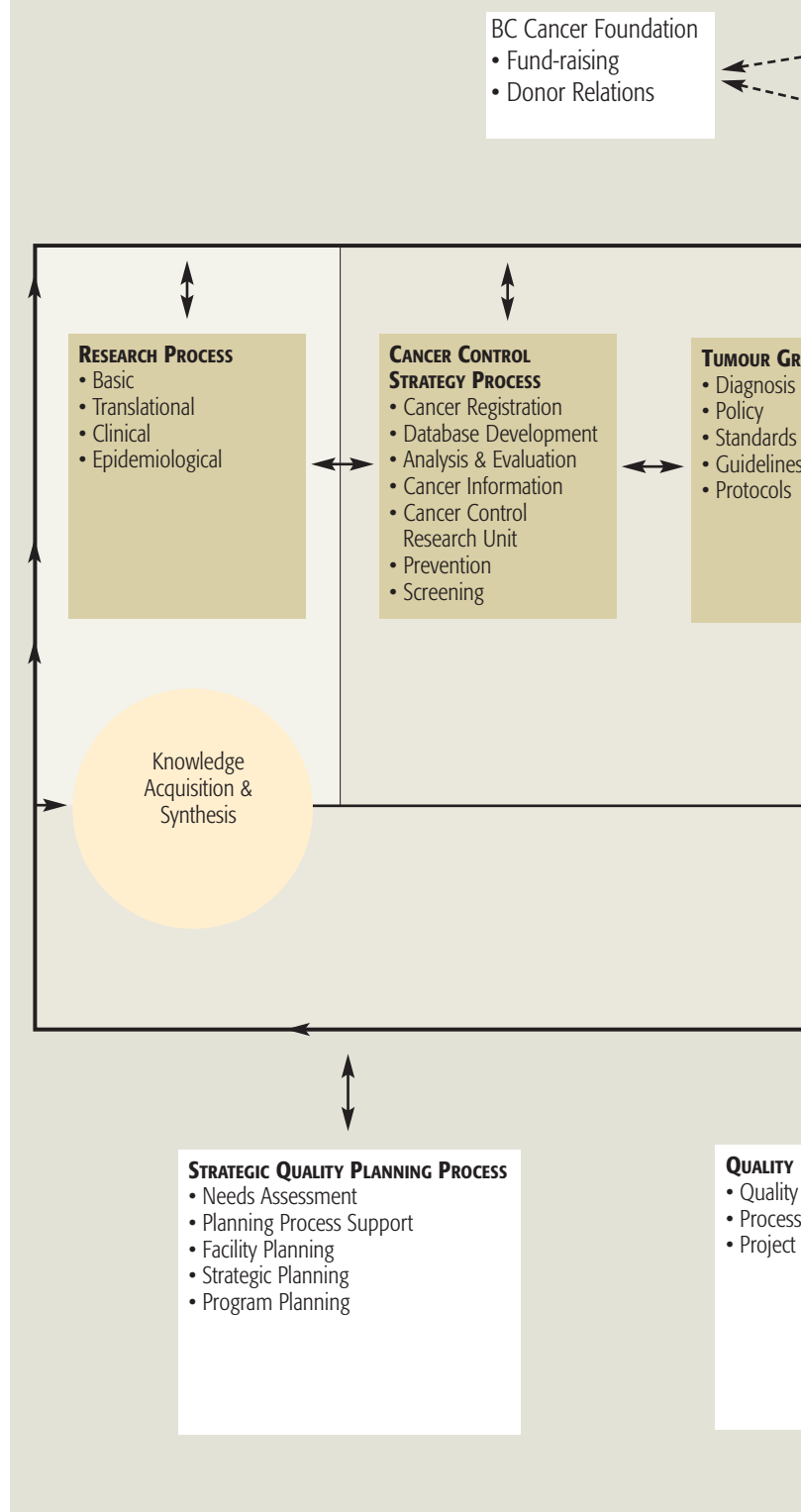
In 1990 the CCABC became the BC Cancer Agency. The Fraser Valley Cancer Centre was opened in 1995, and the Cancer Centre for the Southern Interior opened in 1998.

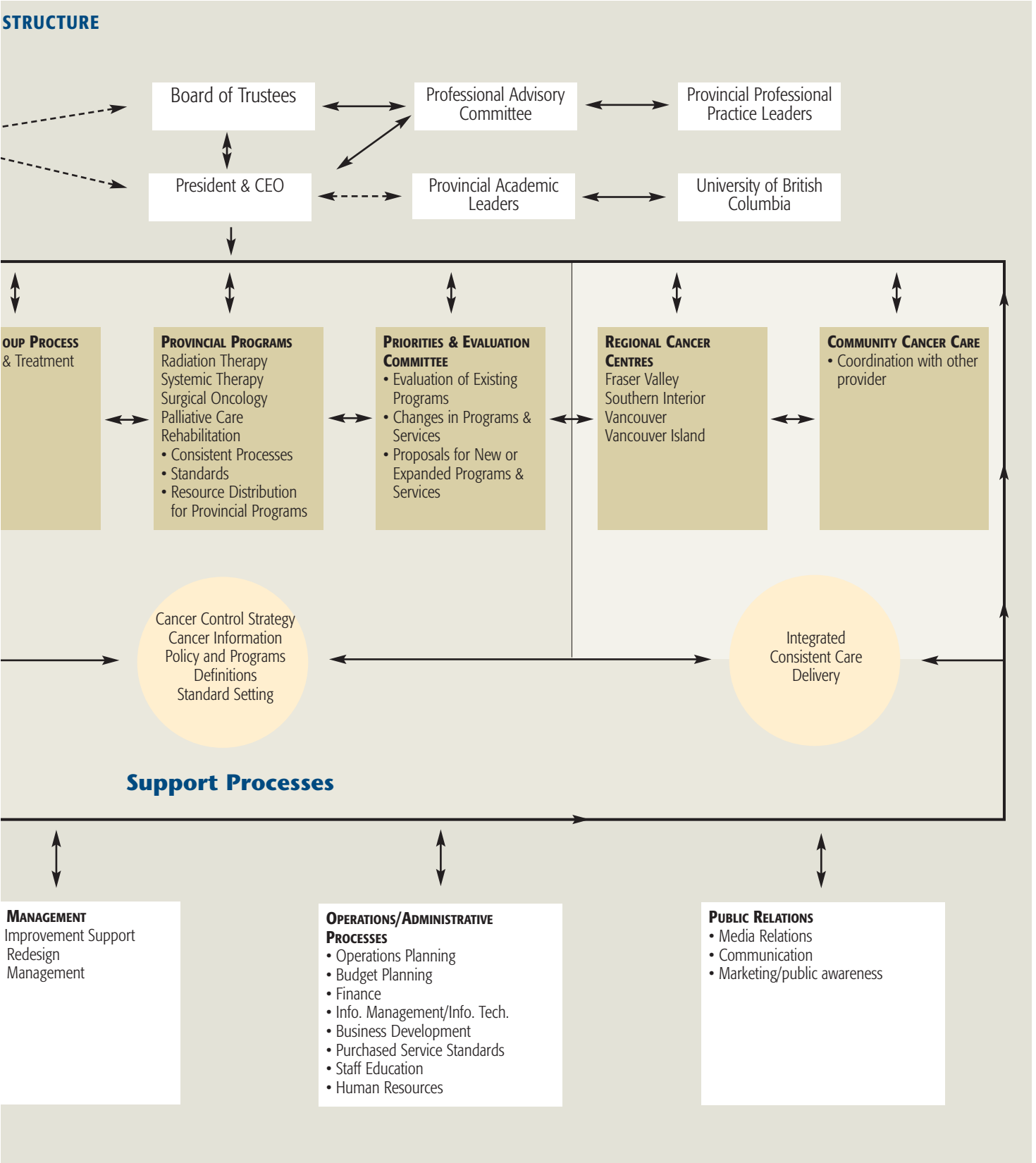
THE NEED FOR CHANGE

Although the BC Cancer Agency had established a solid basis for an effective program in cancer control, a number of issues and developments occurring in the early and mid-1990s created an imperative for the organization to change. These imperatives included a desire to focus more on patients – something that we learned from community consultations; a desire to become a process, team-based organization rather than an aggregation of functional silos – something that we learned from our staff; and a need to become more adaptable in relation to changes that are occurring in the healthcare environment.

Those imperatives more directly related to the further development of a comprehensive and integrated system

Figure 4: **PROVINCIAL PROGRAM AND CANCER CONTROL PROCESS**





included the following:

- Although the Agency had been given a responsibility to operate a provincial program of cancer control in 1974, the structure and processes had not been adapted or realigned to fully achieve this mandate. Paramount was recognition of the importance and the impact of the overall organization for cancer control delivery. It was felt that there was little point in generating knowledge if it could not be consistently delivered through the effective organization and design of the system.
- The Agency's programs and services were rapidly decentralizing. The Agency had to determine how to maintain effective standards of care and service to deliver favourable outcomes that had characterized its highly centralized services in the 1970s, 1980s and early 1990s.
- Healthcare reform was leading to the development of regionalization of healthcare delivery and governance. This not only brought threats to the integrity of a provincial cancer control program, but raised questions as to how a provincial cancer agency could effectively integrate the cancer program within a regionalized system.

As a consequence of these driving forces, the Agency pursued a very ambitious organizational improvement plan, which included major process redesign, organizational restructuring and system-wide restructuring. Some of the outcomes included the elimination of departments with creation of provincial programs and the establishment of Agency-wide common processes. Corporate restructuring of the Agency Executive Team took place, aligning the composition of this team to be consistent with the concept of research to policy to practice. It also included coordinating the activities of the Agency better within the broader regionalized healthcare system. Five Regional Cancer Advisory Committees were established and linked to the major cancer centres that coordinate the activities of these committees. These committees in turn are linked to community-based cancer care teams. The chair of the regional cancer advisory committee is a trustee, nominated by the Regional Health Board, who also serves as a member of the Agency's Board of Trustees.

ELEMENTS OF THE COMPREHENSIVE INTEGRATED SYSTEM

The elements of this system are exemplified in the Agency organization chart (Figure 4).

RESEARCH

In keeping with the theme of research to policy to practice, the Agency declared research as process #1. This provides a clear sense of direction and mission to the entire organization about

the importance of generating knowledge and not maintaining the status quo. All basic science research initiatives were unified through the appointment of a vice-president of research who became a member of the Agency Executive Team. To integrate basic, translational, clinical and epidemiologic research, the research management committee was restructured to represent these various groups. Having the VP Research on the leadership team has been helpful in ensuring the translation of research innovations into policy in a coherent and organized manner, rather than in the more usual way of one-on-one interactions between scientists and clinicians. The VP Research guides all provincial activities in cancer research within the mandate of the BC Cancer Agency. With a focus on innovation, collaborative creativity has been fostered throughout the organization, through linkages and partnerships with all disciplines, with multi-university faculties and other provincial programs with a strong research culture.

The BC Cancer Agency recently established Canada's first high-throughput genome sequencing centre, located in the Vancouver Cancer Centre. This development is based on the fundamental knowledge that cancer results from mutations in genes. The vision is to unlock the mysteries of cancer through sequencing tumour genes, understanding their function and developing much more targeted therapies to reduce the burden of this disease on society. The Genome Sequence Centre is linked with the Biotechnology Laboratory at the University of British Columbia to create a Centre for Integrated Genomics. A major goal for this centre is to bring together expertise in genomics, cancer research, clinical care and biotechnology.

CANCER CONTROL STRATEGY

During redesign the Agency created a process to provide for a strategic cancer control and information resource to support the Agency's mission. Central to this was a recognition of the importance of strengthening the cancer registry and linking it with a number of other activities in a defined portfolio, including cancer control research, cancer prevention, evaluation of patterns of care and outcomes, cancer control planning and policy development, monitoring and surveillance, cancer information and leadership for screening programs such as cervical, breast and hereditary cancers. In many respects, this arrangement is similar to that described by Armstrong (1992) on the expanded role of the cancer registry in cancer control.

Cancer Registry

Cancer registration – the systematic collection and maintenance of a permanent centralized database of cancer records – is increasingly a valuable tool in cancer surveillance and control and vital to improving survival (BMJ 2000). The BC Cancer Registry has been operating since 1969. It registers 97% of all new cases of cancer annually. It has a clear mission – to provide

population-based information for cancer control activities and population-based research. The location of the registry within the BC Cancer Agency connects it with population-based research, strategic planning, services planning, program evaluation and outcomes-based clinical assessment. This arrangement also provides for the necessary scientific and technical expertise in database management, product development and interpretation. Because the population-based registry data and clinical data from the treatment centres are integrated in the same database, the comprehensiveness of the patient rolls, data quality and the range and quality of registry products are enhanced. Some examples of registry information products include:

- Calculation of cancer trends over time and within provincial regions for surveillance purposes.
- Projected estimates of the numbers of future cancers for facilities and workload planning.
- Assessment of progress in cancer survival among patients in British Columbia.

Epidemiologic studies using registry data have identified special populations at risk for cancer, including those occupationally exposed to cancer-causing agents. Collaboration with clinical groups has demonstrated improvements in survival of BC breast cancer patients due to treatment changes. Registry-based studies of regional rates of referral to specialized treatment centres have resulted in improved access to cancer services. In short, this integrated registry system encourages the development of registry information products that meet the needs of cancer surveillance and control for the province. It is guided by a strong group of cancer epidemiologists and biostatisticians.

Screening Programs

Within the cancer control strategy group, the leadership and management of screening programs was centralized, allowing for the development of common provincial policy, consistent standards of operation, uniform centralized quality control and quality management, provincial and regional reporting of outcomes, equal access across the province and concentrated expertise. A centralized data system allows the results of follow-up interventions to be addressed.

Cervical Cancer

For a long time, British Columbia has had a well-developed provincial cervical cytology screening program, which has become a benchmark for the world. Approximately 70% of the population at risk has been screened in the past three years. Samples for screening are taken by physicians in their offices, with slides being referred to a central laboratory at the BC Cancer Agency. To ensure consistent follow-up, abnormal

screens are assessed in regional colposcopy clinics, staffed by gynecologists who are sessionally funded by the BC Cancer Agency working within the standards established by the program. Since its inception the program has achieved a reduction in incidence of cervical cancer by 85% and a reduction in mortality by 78% (BC Cancer Agency 2000).

Breast Cancer

The BC Cancer Agency launched the Screening Mammography Program of British Columbia in 1989. Currently 50% of the population at risk is being screened. Outcome analysis of cancers detected from 1989 to 1996 shows that women attending this program have smaller cancers that are less likely to have spread to axillary nodes as compared to other women diagnosed with breast cancer in the province. Women with breast cancer found within three years of attending the program were more likely to be treated with breast conservation and less likely to experience more radical treatment, and women who attend the program are also more likely to be disease-free five and eight years following the date of diagnosis (BC Cancer Agency 1999). The program has the highest volume of screens of any province and has had the highest number of detected cancers, while providing screening at comparatively low cost.

Hereditary Cancer

The BC Cancer Agency operates a hereditary cancer program currently focused on the hereditary risk for breast cancer. The program includes risk analysis, genetic counselling, laboratory testing and appropriate strategies related to risk for individuals and families.

PROVINCIAL TUMOUR GROUPS

The Agency created tumour-specific groups to develop a standard-setting system. These groups were also forums for professional collaboration to develop and implement provincial guidelines and policies for the diagnosis and management of cancers and, in particular, to apply these across the province. Tumour group work continues, and the Cancer Management Manual is a vital resource for cancer care and control in British Columbia and is available on the Agency's website. Today, a central tumour group office and executive leader further support and strengthen these activities.

A tumour group council outlines the broad framework for the activities of individual tumour groups, developing standards, policies and guidelines, cancer control strategies, evaluating outcomes and providing tumour site-specific consultative services to physicians throughout British Columbia.

Further work is needed to strengthen the linkage to the overall care process throughout the province as well as to define a stronger role in clinical quality and clinical resource

management. Also important will be the development of improved support for clinical information and clinical management tools. Further work is also needed on the evaluation of levels of compliance with evidence-based treatment policy, and better support is needed for health systems delivery research that can guide further improvements to the organization of the system.

PRIORITIES AND EVALUATION

A key concept that emerged from organizational change in 1996 was the need for an internal body that would support decision-making at the executive level. The Priorities and Evaluation Committee (PEC) was established with members drawn from each of the six major processes – radiation therapy, systemic therapy, cancer control strategy, patient care, planning and finance, with surgical oncology joining later. The initial broad mandate was to align resource acquisition and use with the mission to prevent, cure and palliate cancer by designing an equitable review mechanism that meshed with the annual budget cycle. PEC set up an annual cycle to review proposals for new activities of all types, using an open and explicit methodology for assessing benefits and harms to patients or population, and resource impacts on the organization and others. Proposals are solicited from the provincial tumour site expert groups and others, with an average of 25 proposals per year for new evidence-based cancer interventions and mission-aligned patient care activities. PEC provides rigorous arm's-length evaluations in consistent and comparable format by establishing review panels that include a balance of both expert and non-expert members, thereby obtaining multiple perspectives and drawing the organization at large into the process. The PEC evaluation process has developed a reputation for being objective, credible and useful. It has been well accepted because it provides a bridge rather than a barrier between those who wish to introduce new activities and those who must choose among them.

PROVINCIAL PROGRAMS

To ensure consistency in standards of care for radiation, systemic and surgical oncology, a provincial program structure was established for the Agency. Also developed were provincial programs in rehabilitation and palliative care, which were networked to the rest of the province. Each program is led by a specialist in the particular discipline, and a team works to develop plans, standards and common processes. Teams are comprised of the provincial leader along with process leaders that function for that discipline within each of the cancer centres. Due to local circumstances there is some regional variation; however, by adopting a provincial approach and defining common processes, the way work is done in each of

the centres is essentially similar. A large portion of the Agency's budget is distributed through provincial programs based on established standards and common processes. This allows for balancing, equitable resource distribution and the effective management of a total provincial resource in responding to provincial needs.

Radiation Therapy

In 1996 the Agency developed a provincial program model for the delivery of radiation therapy to the estimated 10,000 patients who require such treatment each year at its four cancer centres. The objectives of this program approach are to:

- Improve access to treatment by balancing supply and demand for service across the province.
- Achieve consistent standards for treatment, technology and process across the system with the goal of improving treatment outcomes.
- Make the system more cost effective through process redesign with a particular emphasis on new technology applications.

The entire radiation therapy process has been redesigned around the three sub-processes of assessment, planning and treatment. Design of the planning and treatment processes has relied heavily on integrating radiation therapy and existing patient information computer systems to reduce the number of hand-offs in the process and to reduce duplication. The ability to link all four centres through a sophisticated client-server computer system operating on a high-speed fibre optic network means significant cost savings in computer hardware. On the software side, significant cost savings have been achieved by adopting site-based licensing arrangements with the major vendors. This was possible as a result of decisions to standardize hardware and software to run treatment planning and treatment systems on a provincial basis.

In order to maximize the benefits of new technology, the Agency has invested heavily in training and education of staff. Through restructuring of staffing arrangements, four full-time training positions have been created in radiation therapy. As a result of the flexibility offered by a provincial program approach, the Agency has been able to reallocate services for patients within the province and in 1997 discontinued the referral of patients for treatment to Washington State. The flexibility inherent in a provincial program model has also minimized the impact of a national human resources crisis for radiation technologists and medical physicists, which developed in Canada in 1999. Innovative use of technology has attracted interest from major vendors in the industry, leading to opportunities for technology development and research collaboration. This will in turn enhance staff retention and future recruitment particularly in the areas of medical physics and radiation oncology.

Systemic Therapy

A provincial model was also developed for systemic therapy. In 1996 a provincial leader for the program was appointed to be responsible for the development, implementation and evaluation of standards of systemic (oncology drug) care for patients throughout British Columbia. Systemic care comprises patient assessment, planning and delivery of care plans, including oncology drug treatment, supportive care, appropriate referral to other programs and community care. The goal is to ensure consistent, high-quality cancer care throughout the province according to the following key principles:

- Provincial standards being applied consistently.
- Services to be provided by professional staff being done on a province-wide basis by those who are knowledgeable in the treatment of cancer.
- Treatment protocols and symptom management guidelines reflect best practice and the best available evidence to improve the survival and quality of life for patients.
- Resources are being managed fairly and equitably to meet the needs of patients being served in all communities.
- Clinical research is an integral component of the program to improve outcomes for patients.
- Consistent information about program services and outcomes collected and analyzed for continuous improvement.
- Service delivery provided as close to the patient's home as possible consistent with maintaining standards of care.
- Quality management an integral component of the program.

Policies and guidelines developed by the tumour groups and the systemic therapy program are implemented throughout the four cancer centres and associated community oncology centres. Physicians have access to all of this information, either through direct contact with medical oncologists or provincial pharmacy staff in cancer centres or through access to the rapidly expanding Agency website. Information transfer occurs via the Cancer Management Manual, the Oncology Drug Manual written by our provincial pharmacy staff, the "Systemic Update" newsletter and published treatment protocols that are broadly available. Access to this information is important to achieve a consistent approach and a rapid transfer of new developments to practice.

The Agency funds all oncology drugs delivered in any B.C. hospital. New and existing oncology drugs are thus available consistently for the same indications in all provincial hospitals. A province-wide reimbursement system for community hospitals and for Agency centres is one of the key factors in achieving equitable cancer care across the province. The ability to plan for new and existing drug programs on a provincial basis means emerging new treatments are available quickly to all patients.

Linking categories of patients with specified diagnoses to

the delivery of oncology drugs and to provincial vital statistics databases means a better ability to evaluate the impact of new treatment initiatives on patient outcomes. Improvements in integrated computer systems will further enhance the Agency's ability to do province-wide outcome and pharmaco-economic analyses.

Surgical Oncology

Although some excellent initiatives have been undertaken in surgical oncology, developing a provincial surgical oncology program is in the early stages. Positive developments have occurred in areas such as ocular oncology, musculoskeletal and sarcoma, and gynecologic oncology. Standards and education programs for the various gynecological tumour sites have been developed, leading to performance levels for ovarian, endometrial and cervical cancers that have been noteworthy compared to the rest of Canada and internationally.

In the past, patients with sarcoma had inadequate and inconsistent surgical care without appropriate pre-operative investigation. In response to this a centralized, multidisciplinary musculoskeletal and sarcoma program was introduced approximately four years ago. This has resulted in a 38% reduction in complication rates.

The same level of structure and development does not characterize all other aspects of surgical oncology. However, a provincial program and academic leader in surgical oncology now serves as a member of the Agency's Executive Team. A strategic planning process has also recently been established. This includes a provincial steering committee and principles, well described in the literature (Sosa et al. 1998; Nguyen et al. 1993; Porter et al. 1998; Silvestri et al. 1998; Woodman et al. 1997; Gillis and Hole 1996; JAMA 1998; Begg et al. 1998; Taylor 2000) that will guide the development of a plan encompassing:

- Centralization of the treatment of small-volume tumours.
- Critical masses of patients to ensure reasonable experience.
- Technical competence of surgeons.
- Multidisciplinary practice.
- The ability of the hospital infrastructure to support surgical oncology practice.

It is likely that the outcome of this strategy will mean fewer surgeons doing procedures, fewer hospitals being involved in surgical oncology and a higher level of standardization through the development and diffusion of standards to ensure excellence in surgical oncology practice. Through this approach, we hope to address issues such as low volumes of some procedures being done in some facilities, variations in application of standards, higher than acceptable complication or recurrence rates following surgical procedures and the resolution of significant access issues that in the current

resource-constrained environment show indications of adversely impacting on outcome.

Cancer Rehabilitation

Rehabilitation issues have become more prominent in view of increasing survival rates, which now approach 50%, and a recognition of the importance of quality of life to patients and their families. Accepting the principle that cancer rehabilitation transcends the cancer trajectory and is not confined to the post-treatment or late stages of the disease, the Agency created the cancer rehabilitation program and network. Its goals are to broaden the scope of rehabilitation practice, develop community links, strengthen interdisciplinary functioning, develop standards of care and implement systems to monitor treatment outcomes.

The Agency has had a well-developed and highly regarded rehabilitation and support group program in the cancer centres that integrates clinical practice, research and education. The network will extend this to other communities in the province. Elements within the program and the network include professional groups, programs and activities, patient and family counselling, psychiatric consultative expertise, multicultural and diversity programs, physical therapies, nutritional counselling, pain and symptom management, and community consultation for care, support, community assessment, education and training. As a result of the 1995 community consultation, the Agency launched a demonstration project in collaboration with the West Kootenay Boundary Health Region to assess supportive care and informational needs of cancer patients in the region and to implement and evaluate a model for community care. The outcome of the project is currently being assessed in consideration of its further application to other communities. This has been the first effort to develop an integrated community-based model of cancer information, care coordination and psychosocial support using a participatory approach to involve the community in designing a service for meeting the needs of cancer patients.

Palliative Care/Pain and Symptom Management

The Agency recognized that while its existing programming was comprehensive, there was not a systematic means to ensure that pain and symptoms were treated according to a standard of care and a process whereby patients whose prognosis was terminal would be seamlessly connected with palliative care providers in their community. A network of care providers from within and outside the Agency came together to develop the Agency's Pain and Symptom Management/Palliative Care (PSMPC) Program. The PSMPC Program is provincial in scope, with interdisciplinary consultative teams and clinics at the four cancer centres. Patients and families are seen anywhere in their trajectory of care, when the manage-

ment of their symptoms outstrips the resources of their primary care team, or where end-of-life planning is looked for by the patient and family.

The PSMPC Program is aligned externally and internally; programming is based and evaluated according to the standards established by the Canadian Palliative Care Association (CPCA) and is inclusive of partnerships throughout the province. Key program activities are linked to the Agency's core processes of knowledge generation, policy/standard development and transformation into practice. The cancer centres are formally linked with palliative care providers in their catchment area to ensure that care planning is seamless and that opportunities for collaborative projects are fully realized.

The vision for the future of the PSMPC Program is to strengthen the partnership with a consortium of provincial palliative care providers and create symptom management standards, interdisciplinary care guidelines and patient education materials that are evidence-based and define best practice. It is hoped that these can link with the Canadian Association of Provincial Cancer Agencies to provide a process and outcomes for a national template. At the same time, the consortium will determine the priorities for symptom management research and create the beginnings of a minimal data set for a symptom management data repository for the province.

CANCER CENTRES

Cancer centres are led by a regional vice-president, a practising oncologist who sits as a member of the Agency Executive Team at the provincial level. In this regard, activities at the corporate policy level are integrated with operations at the regional level. Each of the centres, under the VP's direction, has a leadership team comprised of process, professional practice and a regional operations/cancer care leader. This latter position is responsible for shared services arrangements with the host hospital and the integration of the regional cancer centre's program with the various communities within the catchment area. This position also provides major resource support to the regional cancer advisory committee for that region. The process leaders within the centres have a reporting relationship to the provincial program leader for planning, standards and common processes and report on a day-to-day basis to the regional vice-president to ensure coordinated, integrated care delivery in keeping with the standards that are established at the provincial level.

Most of the budgeting for the Agency is done through provincial programs. Once defined, this is rolled into a single budget package, which becomes the responsibility of the regional vice-president. The regional vice-president in turn distributes this to process leaders, who again function within the framework of common standards and processes for the operation of the centre.

SYSTEMIC THERAPY CLINICS

An important linking system, and one that helps to ensure standardization of care throughout British Columbia, is the existence of 17 systemic therapy clinics that report within the Provincial Systemic Therapy Program for standards, reside within community hospitals and link to major cancer centre for day-to-day operations. These are designed to assure transfer and application of standards and protocols (Kaluzny et al. 1989). These clinics are co-funded by the BC Cancer Agency and the local hospital, with the Agency providing financial support for oncologists, nursing, patient and family counselling, pharmacy as well as the drug budget. Standards for the clinics are established through the Provincial Systemic Therapy Program. Standards and protocols for cancer care and the use of chemotherapeutic agents are distributed to all chemotherapy clinics to ensure consistency.

Again, within common standards and processes, budgets are established for the operation of systemic therapy clinics. These budgets are then transferred to the regional cancer centre for their administration. This is to ensure a coordinated program of delivery between the cancer centre and the systemic therapy clinics that reside within the catchment area of the centre.

PROFESSIONAL PRACTICE LEADERS

With the move to programs and processes and the dismantling of departments, provincial and regional professional practice leaders were established to provide guidance for the development of standards in a consistent manner within the provincial system. Provincial professional practice leaders fulfill this role along with their regional counterparts for disciplines such as radiation oncology, medical oncology, oncology nursing, radiation therapy, physics, pharmacy, social work and nutrition. This arrangement facilitates integration and consistent application of professional standards.

PROFESSIONAL ADVISORY COMMITTEE

Professionals working in programs or processes require a forum whereby they share interests and issues common to their discipline and integrate their activities with others responsible for professional standards. There are also needs for communication among professional groups, for clarity around professional boundaries and for integration of care delivery in the context of provincial programs. This is the intended role of the Professional Advisory Committee. Having said this, there is recognition that the integration of care among a number of programs and disciplines requires further attention. The responsibilities of the Provincial Tumour Group Council as it relates to standards and care processes diminishes a meaningful role for the Professional Advisory Committee. As a consequence, serious consideration is being given to

unifying the activities of the tumour group council with those of the Professional Advisory Committee to ensure a linkage between standard and guideline development and the application of these to care delivery throughout the centres, chemotherapy clinics and community-based programs.

INFORMATION MANAGEMENT

Integrated information management is essential to carry out a provincial cancer control mandate. The Agency is unique in its deployment of information management systems and information technology in a provincially decentralized, multifacility environment. A secure high-speed fibre optic network allows the Agency to operate all its programs and facilities with centralized software products working in a client-server environment. The standardized practices of provincial programs are carried out in a uniform manner with the benefit of common hardware and software. Benefits through the facilitation of common patient care and support practices and processes are significant. Financial benefits have resulted from eliminating the need for multiple software licences and maintenance agreements. Standardization of client and server hardware has resulted in significant economies in hardware replacement costs and maintenance requirements. Training times and costs are also reduced. All staff members can access any information they require, from any venue, with a hardware and software infrastructure they are familiar with.

Common and centralized information systems create opportunities for sharing of resources and redesign of processes within a provincial system. Only one medical record is needed for patients, no matter where they access care in the provincial cancer system. Staff at any of the Agency's centres, depending on workload distribution, can transcribe medical notes that are dictated in any centre. Staff recognize that the infrastructure in place has created significant benefits already, but more important the organization has laid the groundwork for even greater innovation in the future.

HUMAN RESOURCES

Like many multifacility healthcare organizations, the BC Cancer Agency has created standardized roles and job descriptions for staff working within its centres. Further value has been added to this arrangement through negotiations with unions representing Agency staff to create a common bargaining unit. This enables many staff to bid on and access jobs in any cancer centre, which in turn enables the Agency to retain the expertise it has developed. This has been a critically important factor in the opening of new cancer centres where the majority of staff have come from existing centres. New cancer centres can come into full productive operation with staff who are already familiar with the technology and work processes employed.

VIDEOCONFERENCING

All of the centres are linked by a videoconferencing system that allows for tumour group meetings, patient clinics and conferences and administrative meetings to be held with full real-time participation of these major components of the system. Over time, this will be progressively expanded to link all other aspects of the BC Cancer Agency system.

FACILITY PLANNING

A provincial approach has been adopted for the development of cancer facilities programs and services. The Agency's central planning office coordinates all provincial planning for cancer programs, facilities and services based upon data that is provided by the BC Cancer Registry, annualized and interpreted by the Cancer Control Strategy group. Planning is based on standards for facilities and staffing and for the size of centres relative to critical masses and effectiveness. Through planning activities, the Agency has been able to identify facility and other capital requirements to 2010, including size, scope and location of services.

RESULTS/OUTCOMES

FAVOURABLE MORTALITY OUTCOMES

Recently, the health statistics division of Statistics Canada (1998) developed a comprehensive report on cancer mortality across the nation. This report was based on mortality data for 1994 to 1996. The data from British Columbia were used as the standard by which the experience of all other provinces for all cancers were compared. British Columbia's experience was used to define the expected numbers of deaths in each of these categories for each province. This was then compared to the observed death. For British Columbia, the report shows a 15.1% better survival rate for all male cancers and a 5.6% better survival rate for all female cancers compared to the rest of Canada combined.

There has been considerable debate about the reason for these favourable outcomes in British Columbia, and no doubt more research is needed to explain these differences. Is it lifestyle? Is it the organization of the system itself? Certainly, there is an increasing body of literature throughout the world that is indicative of a strong correlation between the ability of an organized system to deliver consistent, evidence-based service and treatment to a population and favourable mortality outcomes. While the debate continues and further studies are needed there are reasons to believe that these favourable outcomes may be linked to the organization of cancer control service delivery in this province.

The Cancer Management Manual has been produced for many years. Agency staff believe it is the consistent application of these treatment policies through the organization of the B.C. system that contributes significantly to the more

favourable outcomes in British Columbia compared to the rest of Canada. The Agency also believes that the system facilitates rapid application of new developments into practice – something else that the literature defines as contributing significantly to reduced mortality.

Although data on the level of compliance with all treatment policies are incomplete, some unpublished data on several tumour sites suggest and studies on breast cancer conclude that compliance and consistency in British Columbia are high (Sawka et al 1997; Olivotto et al. 1997). More information is needed about the level of performance for all tumour sites. In addition, more specific data about the level of compliance with treatment policy in the regions can serve as the basis for continuous improvement.

PRODUCTIVITY/COST COMPARISONS

The Agency has a high level of productivity, consistency and comparatively low cost for some areas of its operations. In radiation therapy, compared to other provinces, British Columbia has the highest ratio of patients treated per machine per year. The best available information would indicate that British Columbia spends less per capita on cancer drugs while achieving more favourable outcomes. Agency staff believe that this is because there is a single provincial budget for all chemotherapeutic agents administered by the Agency, standardization of the formulary and an adjudication system to ensure compliance with treatment protocols.

ACCESS TO CARE

While access for radiation therapy services continues to be an issue, it is progressively improving. Fifty-eight percent of incident cancer cases receive radiation therapy, which is close to the optimal of 60%. Approximately 50% of patients requiring radiation therapy receive it within two weeks of a decision to treat by a radiation oncologist and 70% within four weeks. Although not optimal, the Agency has not had to resort to out-of-province referral, and by the spring of 2001 radiation treatment capacity will be available to meet the needs of the province's population. Despite some continuing access issues in radiation therapy, the presence of a provincial system has allowed for balancing of the distribution of resources along with the capacity to enable a reasonably consistent approach to access for those British Columbians in need. Significant access issues currently exist for surgical oncology patients due to a number of factors, including nursing shortages, which have led to the closure of many operating rooms, resource constraints, and inconsistent booking and priority-setting practices. Again, this will be addressed through the development and implementation of surgical oncology strategy.

FRAGMENTATION OF CARE

The Agency has put significant effort into coordinating care between its own and other providers in the province by establishing provincial, regional and community-based integrating structures. Further effort is required. Fragmentation that occurs by virtue of the fact that surgical oncology still lies outside the formal cancer system must also be addressed. There is a need to develop more explicit standards for surgical cancer practice, and to connect surgical oncology in a manner that embodies the principles previously described.

VARIATIONS IN PRACTICE

Reference has been made to the need to further develop the surgical oncology program. We are aware of low volumes of procedures done in some facilities, variations in the application of practice standards and unacceptably high complication or local recurrence rates. For example, rectal cancer affects about 700 patients annually in British Columbia. In a recent review, it was found that recurrence rates for rectal cancer among patients referred to the BC Cancer Agency was 23%. Best practice would predict that less than 5% of rectal cancer patients should have a local recurrence. It is noteworthy that over 140 surgeons perform these procedures throughout British Columbia and many perform fewer than five operations annually.

DIAGNOSIS – PATHOLOGY AND IMAGING

Further improvements are also needed in cancer pathology to reduce variation in practice and improve outcomes. Well-developed cancer pathology expertise is very important in achieving a precise diagnosis, accurate staging and an appropriate plan of treatment. It is also the cornerstone of reporting to the BC Cancer Registry where the incidence and mortality from this disease by site, sex and geographic region along with a number of other parameters are tracked. In short, accurate cancer pathology reports are central to cancer control. Worldwide experience, and British Columbia is no exception, indicates that for those specimens referred to a cancer pathology consultant group, there is a rate of change in diagnosis and staging in excess of 20%. This level of variation characterizes tertiary referral as well as community-based hospital pathology services. While many of these changes have been minor in British Columbia, there have been examples of diagnostic error leading to inappropriate treatment.

The issue of consistency in cancer pathology practice therefore remains to be addressed. The Agency will be undertaking major improvements to cancer pathology through the development of a core number of experts who will be connected through the province and who will establish tumour site specific standards for reporting, as well as criteria for second-level review. This group will continue to provide a consultation

service to other pathologists throughout the province on problem cases.

There are also issues to address in diagnostic imaging, including long waiting times for access to CT scanning, needless examinations being done, the need for standards for oncologic imaging and improved timing of the use of imaging modalities. Some procedures are done in parts of the province where appropriate diagnostic support is not available, and there are times when surgical procedures are being done to assess the presence or absence of cancer as well as the stage when a less invasive diagnostic imaging procedure would be more appropriate. The Agency will promote the development of standards for cancer diagnostic imaging, undertake studies to assess the level of compliance with standards and make recommendations arising from these results.


LESSONS LEARNED AS A CONSEQUENCE OF LARGE-SCALE ORGANIZATIONAL CHANGE

In the mid-1990s, the BC Cancer Agency underwent significant organizational change in order to better achieve its mission and vision and to respond to changes that were occurring in healthcare. Some of the lessons learned from this process of change are outlined below.

- The importance of a shared vision throughout the organization versus the vision of an individual, and the importance of building the capability of everyone versus the capability resting in the hands of one or a few.
- The importance of embracing a comprehensive and integrated approach to cancer control through a single organization with a dedicated budget.
- The importance of a provincial approach to planning and standard development as well as the development of common and consistent processes. Adopting a provincial approach has enabled us to equitably distribute resources and equalize the distribution of the patient load to achieve balanced access for all.
- The importance of the commitment and buy-in of the leadership team to this level of change, and developing and building their capability to lead and manage change in their areas of responsibility.
- The magnitude of the impact of the change and the level of commitment that would be required to see it to fruition was underestimated; organizational change was estimated to take two to three years; it is likely that it will take up to seven years to complete.

- To understand and apply the principles of change management. Ultimately a change management strategy was developed – this could have been introduced at an earlier stage of the process.
- The value of communication about the imperative. A powerful imperative is paramount in moving forward with change. Initially, staff felt that this was simply a cost-cutting exercise, when in fact we were attempting to build a provincial program to better achieve the mission and vision of the organization.
- The importance of consistency between what we say and what we do. It was difficult through the early phases to balance the level of change required and organizational values when “tough” decisions were needed to implement significant change.
- The need to clarify roles and responsibilities with this level of change. There was ambiguity about roles, responsibilities and relationships throughout the organization, which resulted from shifting from a hierarchical approach to management to one that was team and process-based.
- The need for a coherent implementation plan and strong project management.
- Balancing the emphasis on provincial programs relative to regional operations. While a provincial approach has brought significant consistency, there was initially felt to be a dominance at the provincial level. Although some issues remain, the pendulum has swung more towards the middle in establishing a balance between provincial and regional operations.
- The importance of risk taking and being prepared to take on very bold and audacious goals; while at the outset some directions seemed impossible to implement, they did serve as a powerful force to achieve what would otherwise not have been attempted.
- That an organization going through this level of change can be a great place to work – very creative, very stimulating, but not necessarily for everyone.

That this level of change has occurred throughout the BC Cancer Agency is a tribute to the commitment of the leadership team and all of the staff. While there is further work to be done, everyone can be proud of how far the organization has come and the achievements to date. Those who have gone before put together a strong basis for this organization in the

1970s and 1980s for it to move forward. In many respects the achievements of those individuals created the possibility for change today and most certainly established the basis for the BC Cancer Agency to show evidence of excellent performance. This work led the organization to be recognized through the receipt of a Quality Council of British Columbia Award of Distinction in Improvement Planning in 1999. 

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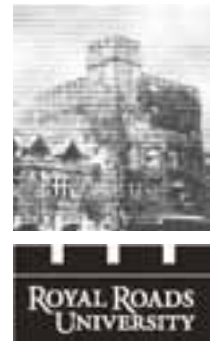
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