CANCER
INFO-KIT
FOR FIRST NATIONS OF QUEBEC

FOR CAREGIVERS WORKING WITH FIRST NATIONS POPULATIONS

ACKNOWLEDGEMENTS

The First Nations of Quebec and Labrador Health and Social Services Commission (FNQLHSSC) is pleased to present its Cancer Info-Kit, intended for caregivers working with First Nations.

We especially want to thank the caregivers in the communities who contributed by identifying the needs and by validating the kit's contents, and to Dr. Bouchard and Dr. Vollant for reviewing the information.

Finally, we wish to thank the Canadian Partnership against Cancer for its financial contribution to this project.

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This document is available in French. It is also available in its uncut version on the FNQLHSSC website: www.cssspnql.com

ISBN: 978-0-9783606-3-4

This kit has been prepared in solidarity which both cancer patient and all professionals and caregivers who are uniting their efforts in the fight against cancer with a common goal: to confront and defeat this disease.

This battle, that each is fighting, involves effort, vigilance, perseverance, exceeding one's limits, compassion and guidance.

The fight against cancer also requires an understanding of the situation, the risk factors, the prevention, the means necessary to diagnose and fight, as well as commitment, mobilization, sharing of knowledge and resources and cooperation in favour of the health and well-being of each individual.

Following the needs expressed at the Forum "Together, let's fight against cancer", this project is an initiative to try to better equip the caregivers in the various facets of their practice with the First Nations.

The passion of the caregivers, the dedication of the family caregivers and the courage of the fighters are a source of motivation, admiration and examples of the various battles we must face at one time or another over the course of our lives.

We hope that the contents of the kit will be helpful in your everyday work.

Sincerely,

Guylaine Gill,
Executive Director - FNQLHSSC

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PREFACE

The **Cancer Info-kit for First Nations of Quebec** is offering a synthesis of knowledge related to the problem of cancer in general and particularly its impact on the Aboriginal population of Quebec. This awareness tool is intended to be practical and includes a wealth of information on the continuum of care and services, from prevention to palliative care, while overseeing cancer treatment as well as symptoms of the disease, its detection, diagnosis and follow-up. The fifteen types of cancer most prevalent amongst First Nations and Inuit of Quebec have been more specifically targeted and various resources in the fight against cancer have been identified.

The technical and medical information contained in the **Cancer Info-kit for First Nations of Quebec** was taken from the documentation available online from the *Canadian Cancer Society* and « *The Canadian Cancer Encyclopedia™* » available on the same website under the tab « About cancer/Cancer encyclopedia ». The more analytical and/or general information on the current picture of cancer in Canada, in Quebec and within the Aboriginal population of Quebec was taken from memoirs, studies and various documents published, among others, by the First Nations of Quebec and Labrador Health and Social Services Commission (FNQLHSSC), the *Institut national de santé publique du Québec*, the Canadian Partnership Against Cancer and the Canadian Cancer Society. These resources are listed in the **References** section and, on some occasions, within the text. Furthermore, the statistical data quantifying the situation in Canada and in Quebec was taken from the reports *Canadian Cancer Statistics 2009 and 2010* and those centred on the Aboriginal population of Quebec, from the study «*Cancer among Aboriginal people living on reserves and in Northern villages in Québec, 1984-2004 – Incidence and mortality*. Finally, the information specifically addressing the connection between diet and cancer was derived from a book written by physicians and researchers Richard Beliveau and Denis Gingras and entitled *Foods that fight cancer*.

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THE CURRENT SITUATION AMONG THE ABORIGINAL PEOPLE OF QUEBEC

THE SOCIO-SANITARY CONTEXT

The *Quebec Region First Nations Regional Longitudinal Health Survey (RHS)* 2002-2003 provides a rather significant overview of health and social services in the First Nations communities of Quebec. Identifying numerous indicators that can be linked to known risk factors of cancer, as we shall see later, this survey, conducted by the First Nations between August 2002 and November 2003, could explain, in large part, the conclusions that the *Institut national de santé publique du Québec* reached in its March 2009 study. Entitled *Cancer among Aboriginal People living on reserves and in Northern villages in Quebec, 1984-2004 – Incidence and mortality* this study indicates the following in the foreword: "Cancer incidences and cancer deaths are increasing very rapidly among the Aboriginal populations. While the issue, some decades ago, was almost inexistent, it is today an important concern to those populations and to the public health authorities. "

From the outset, we can say that the *Institut national de santé publique du Québec*'s greatest merit would be its contribution to scientifically validate the sad reality that is the progression of cancer in Aboriginal and Inuit communities, over the last three decades. If this first scientific publication can be seen as an important support in the fight against cancer, the conclusions of the study are nevertheless not surprising to the caregivers working with the First Nations and Inuit of Quebec. Indeed, the increase in cancer among Aboriginal people in Quebec has been the subject of an empirical observation for several years and is reflected in numerous reports on the health of Aboriginal peoples, as is the case with that of the *RHS 2002-2003*.

The report of this survey among First Nations covers a period included within the two decades 1984-2004 corresponding to the study of Quebec authorities on the state of cancer among Quebec Aboriginal people. Many clues relating to the general state of health and habits of life of Aboriginal populations, that have a direct connection with the causes of cancer, are listed within.

For example, the report indicates that 40.1% of Aboriginal children are obese and 12.2% are overweight. Among Aboriginal youth, 20.3% are overweight and 21.7% are obese. Among Quebec Aboriginal adults, some chronic diseases, such as diabetes and respiratory problems, are increasing, according to a comparison made between the RHS survey of 1997 and that of 2002-2003. Nearly two-thirds of adults (63%) say they are suffering from medical problems. The most common are musculoskeletal problems (23.3%) and cardiovascular problems (21.8%). The RHS 2002-2003 survey also indicates that over two-thirds of adults (67%) are overweight or obese while only 26.4% of adults, just over a quarter of that age group, have a normal weight. Approximately 14.5% of adults have diabetes, women in a greater proportion (16.4%) than men (12.5%). In the case of seniors, 84.9% of this age group say they are suffering from medical problems, the most common being cardiovascular (49.1%), musculoskeletal (44.2%), visual or hearing (35.9%) and diabetes (33%). Finally, 51.4% of seniors are overweight and 29.4% are obese.

Smoking is of particular concern among the First Nations of Quebec. More than half of the adults are tobacco smokers. Just over a third of young Aboriginal people smoke, this number increases with age. The average age they start smoking is 12 years. At the time of the survey, a little more than half of the pregnant women said they were smoking.

In terms of alcohol consumption, the *RHS 2002-2003* survey stresses that the abstinence rates among Aboriginal people are higher than in the general population. Only 17.8% of Aboriginal adults reported drinking alcohol weekly or daily, compared to 44% of the general population. Yet, alcohol abuse is twice as high among First Nations than in the general population. As for drug use, the frequency of use of illegal drugs is relatively low. The *RHS 2002-2003* survey indicates a consumption rate of 7.3% in connection with five illicit substances among the Aboriginal population over the previous year. This rate is, however, two times higher than in the general population (3%). Marijuana is the most currently used substance.

In general, a decrease in alcohol and drug consumption was noted with age. The 18 to 29 years age group is, by far, the one with the highest frequency of consumption. The impact of alcohol and drug use in the Aboriginal communities is significant. Deaths related to alcohol are six times more frequent, while drug-related deaths are three times higher than in the general population.

Some risk factors and some behaviours are contributing to the spread of HIV and hepatitis C among First Nations. In Canada, the Aboriginal population is one of the most vulnerable to hepatitis C. During the year 2000, there were, per 100,000 people, 3.18 new cases of hepatitis C among the general population while, among Aboriginals, that ratio climbed to 17.5 new cases.

Finally, the *RHS 2002-2003* survey indicates that only 21% of adults perform thirty minutes of physical activity per day.

THE CANCER SCOURGE

AMONG THE ABORIGINAL POPULATION

For the first time, the status of cancer among Aboriginal people in Quebec has been measured in terms of incidence and mortality. The results found in the publication by the *Institut national de santé publique du Québec, Cancer among Aboriginal people living on reserves and in Northern villages in Quebec, 1984-2004*, clearly confirm the cancer progression among the First Nations and Inuit of Quebec.

As previously seen, in the *RHS 2002-2003* survey, First Nations and Inuit are now faced with many chronic diseases that have long been the prerogative of the non-Aboriginal population. Cancer, even though increasingly common, has always been unrecognized in terms of its prevalence in Aboriginal populations. Through the study by the *Institut national de santé publique du Québec*, the health services authorities among Aboriginals Quebec or Canada, can now better assess the extent of the cancer spread, despite the possibly low bias in terms of the methodology used for data collection.

Indeed, researchers have used the residence (Geographical Code System) as registered in the *Fichier des tumeurs* (Tumour File) and the *Fichier des décès* (Record of Death) to identify cancer cases among Aboriginal people. Such methodology does not allow for the distinction between natives and the rest of the population, therefore including in the data processing Non-natives living on reserves and northern villages targeted by the study. Furthermore, Aboriginal people living outside these agglomerations could not be tallied. Beyond this gap, the results from this study provide a relatively accurate picture of the cancer situation in populations with a very large Aboriginal majority living in the targeted territories and can be considered reliable data.

Amongst other things, the study reveals that "1,603 new cases of cancer (795 men and 808 women) were found in the Tumour File and 766 deaths by cancer (427 men and 339 women) in the mortality file for the Aboriginal population. The number of new cases of cancer and deaths by cancer has more than doubled between 1984 and 2004." Moreover, the study characterizes the spread of cancer among Aboriginal populations by identifying the most common types of cancer and by making comparisons both among Aboriginal populations as with all of Quebec, which provides a series of additional indicators that may help better explain the causes while identifying high-risk

factors, as we will see later on. The following can be read in the summary findings of the *Institut national de santé publique du Québec*: "The most common cancers are lung and colon-rectum cancer (...) The results also show that cancer incidence and cancer mortality rates among Québec Aboriginal living in reserves and in Northern villages equal or even exceed those observed for all of Québec, although the difference is not statistically significant, the rates vary according to Aboriginal nations. The Attikamek, Huron-Wendat, Innu and Inuit show high rates while the Algonquin, Cree and Naskapi show lower rates."

More specifically according to the types of cancer, compared with Québec as a whole, the following information can be learned: "The cancer incidence rates are significantly higher among Québec Aboriginals than for all of Québec for liver, lung and kidney cancers for men as well as colorectal, lung and cervical cancers and other sites for women. In terms of mortality, Aboriginal men in Québec show a significantly higher rate for liver cancer. Among Québec Aboriginal women, the mortality rates are significantly higher for lung, cervical and other cancer sites. " The study also indicates that Aboriginals, when compared to the non-Aboriginal population of Quebec, show lower incidence rates for many cancers such as, for example, breast (in women), uterus, prostate, bladder, brain cancers as well as leukemia. They also show lower mortality rates for colorectal, stomach, pancreas, breast (in women), bladder, brain as well as non-Hodgkin's lymphoma and leukemia. *(See Appendix 5)*

IN QUEBEC AND IN CANADA

All in all, it can be said that the cancer situation among Aboriginal people of Quebec tends to resemble more and more that of Quebec and Canada and even, in some cases, to exceed it. Let us remember that, since 2005, cancer is the leading cause of mortality in Quebec. According to new statistics on cancer published in the report *Canadian Cancer Statistics 2010*, it is estimated that 173,800 new cases of cancer will be diagnosed in Canada in 2010, including 45,200 new cases in Quebec alone. Moreover, 76,200 deaths will be ascribable to this disease in all of Canada, including 20,300 deaths in Quebec.

The three types of cancer responsible for the majority of new cases among men are prostate, lung, colorectal and, among women, breast, lung and colorectal cancers. Lung cancer remains the most common cause of death due to cancer in Canada, both in men and in women. Overall, colorectal cancer is the second leading cause of cancer mortality.

Based on the current incidence rates, nearly 40% of Canadian women and nearly 45% of Canadian men will develop a cancer during their lifetime, so just over one in 2.5 women and nearly one in two man. Based on the current mortality rates, 24% of women and 29% of men, so approximately one in four Canadian, will die of cancer. Also the *Canadian Cancer Statistic 2010* report indicates that "the growth in the number of cancer cases and deaths which has occurred over the last 30 years is primarily the result of an aging population, and to a lesser extent, increasing population size. As long as current trends continue, there will be a commensurate annual increase in the number of new cases and deaths. "

To control as much as possible this upward trend in cancer cases in the increasing and aging population of Canada, concrete measures for the organization of the fight against cancer throughout Canada have been taken several years ago. From 2002, Canada released its integrated program of fight against cancer as an action plan. Thus has emerged the *Canadian Strategy for cancer control*, after an intense collaboration that brought together the federal government and its partners, namely the provinces, territories and several non governmental organizations, including oncology specialists, patients and cancer survivors as well as several volunteer groups dedicated to the fight against cancer. Subsequently, the Public Health Agency of Canada was mandated to develop, in cooperation with the partners, the implementation of the *Canadian Strategy for Cancer Control*. Thus the federal government announced, on November 24, 2006, the establishment of the *Canadian Partnership against Cancer*, an independent organization whose mission is to implement the *Canadian Strategy for Cancer Control*. This announcement was also accompanied by a federal funding commitment totaling $ 250 million over five

years. Since its creation, the *Canadian Partnership against Cancer* has played the crucial role of catalyst for the different groups working on the fight against cancer in Canada. Additional information on the *Canadian Partnership against Cancer* can be found in **Appendix 1** of the **Cancer Info-kit**.

In Quebec, the development and publication in 1998 of the *Programme québécois de lutte contre le cancer* (free translation: Quebec Program against cancer) has revealed some gaps in the care and services available in Quebec, such as poor access to services including palliative care, lack of humanization in the transmission of information to patients and lack of support at all stages of the disease.

The Quebec strategy for the fight against cancer has led to the creation of the *Direction de la lutte contre le cancer* in 2004, whose mission is to guide and support the cancer control activities in response to the needs of the Quebec population, the cancer patients and their relatives. Its action plan is based on the *Orientations prioritaires 2007-2012 du programme québécois de lutte au cancer*.

In recent years, efforts have been particularly dedicated to the implementation of the *Plan québécois de lutte contre le tabagisme 2006-2010* and the Quebec Breast Cancer Screening Program introduced in 1998 as well as access to radio-oncology services, which has seen significant progress. Among other achievements, the following should be noted: evaluation and designation of Interdisciplinary teams to fight against cancer, the "oncology pivot nurses" integration promoting better coordination of care, and the publication of numerous clinical practice guidelines appropriate for physicians. Although many improvements have been observed, some noted gaps still remain a concern.

Many organizations involved in the fight against cancer emphasized some of these deficiencies and questioned the authorities. The view advocated by the *Coalition Priorité Cancer au Québec* (Coalition Priority Cancer in Quebec) can be found in **Appendix 2** of the **Cancer Info-kit**.

A HISTORICAL REVIEW

Today, unfortunately, it is now very clear that cancer has become a major public health problem for all communities living in Quebec and Canada. First Nations and Inuit populations as well as Canadian and Quebec are now faced with the same urgency to fight effectively against the cancer scourge.

In addition, numerous studies highlight how the abrupt changes that have occurred in the lifestyles of Aboriginals and Inuit had a devastating impact on their health. Some studies explain that in the mid 20th century, declining access to traditional food from hunting, trapping and fishing, combined with the marginalization of traditional activities and the increased use of subsidies from the State quickly caused a deterioration of health and the degradation of a certain quality of life among Aboriginal and Inuit populations. Aboriginal peoples are gradually facing a change from their traditional lifestyle to more sedentary ways of life. The practice of physical activity is decreasing. Furthermore, processed foods are becoming the standard in food supply. Current data on the health of First Nations clearly indicates that consuming carbohydrates, especially in soft drinks, has led to the serious problem of obesity that exists today, while people from Aboriginal communities of Quebec are two to three times more prone to obesity and being overweight, when compared to the Canadian population.

Furthermore, a study by the *Commission de l'éthique de la science et de la technologie du Québec* (free translation: Quebec Science and Technology Ethics Committee), published in November 2003, about Native American culture, states that: "The structural changes that aboriginal people are going through are vividly reflected in the health and social problems they are facing. Until 1960, all Aboriginal nations were characterized by health problems caused by infectious type diseases: diseases of the respiratory apparatus or the digestive system; from the 1980s, a kind Epidemiological turning point was noted: Infectious diseases remain stable and tend to decrease, while diseases of modernity tend to increase, in particular drug

addiction, diabetes, suicide and stroke." In light of the study from the *Institut national de santé publique du Québec*, published in March 2009, we can now add cancer to the list of health problems among Aboriginals of Quebec.

This improved control over infectious diseases has had an impact on the Native American life expectancy. Thus, in 1980, the life expectancy at birth for Aboriginals in Canada was 60.9 years for men and 68.0 years for women and, in 2001, 70.4 years for men and 75.5 years for women (source INAC 2005). The gap is closing, but life expectancy still remains lower than the general Canadian population's life expectancy that was, in 2001, 79.0 years for men and 82.3 for women. Since the risk of cancer increases with age, increasing the Aboriginal population life expectancy will also increase the risk of developing cancer.

2 THE IMPORTANCE OF PREVENTION AND SCREENING

THE IMPACT OF RISK FACTORS

The Canadian Medical Association defines risk factors as a set of factors that individually are not sufficient to cause a disease but, if added, can prepare its outbreak. This definition applies perfectly well to cancer, more so as cancer is considered a complex problem ascribable to more than one cause. For many experts, cancer is not a disease but a set of diseases affecting many organs and body parts. The fight against cancer thus does not concern only one specialist but rather a string of professionals and medical specialties.

With scientific progress and the development of knowledge in oncology, many factors have been identified as representing a potential risk of cancer. Some have been described as low risks, others, as high risks. Low risk does not mean that the person will never have cancer, but that he/she is less likely to suffer from one. High risk means that the odds of developing cancer are greater but not absolute. In general, consciousness of the risk factors represents an important element in any strategy to fight against cancer. Risk factors provide information on potential causes. With this critical information, people should therefore be able to change some harmful habits and certain behaviours associated with the spread of cancer in many cases. To prevent the disease, should we not, first and foremost, have a healthy lifestyle?

As previously discussed, First Nations and Inuit of Quebec are facing several major health problems, including some found in the list of risk factors associated with cancer. Obesity, diabetes, smoking, alcohol and hepatitis C are indeed identified as factors that may increase the risk for a person to be diagnosed with cancer during his/her life. More information about risk factors relating to each type of cancer can be found in the **Fourth Section** of this Cancer Info-kit, under **Risk Factors**.

THE ISSUE OF SCREENING

Overall, screening programs are designed to detect the presence of cancer during a routine medical examination, before the onset of any symptom. The earlier a cancer is detected, ideally even before it has spread outside the initial site of the outbreak, the better the chances of recovery. Furthermore, early detection allows the patient to benefit from less toxic treatment and, consequently, from a better quality of life.

The detection resource takes the form of various examinations and in some cases, screening techniques, developed according to each specific type of cancer, colorectal cancer, breast cancer, prostate cancer and cervical cancer in particular. Since May 1998, Quebec has developed a breast cancer screening program for women ages 50-69 years.

Some screening exams even help prevent cancer from developing by revealing changes in the body that may become cancerous if not treated. For example, a colonoscopy allows the physician to visualize the mucosa of the patient's colon and remove polyps during the same intervention. Considered as benign tissue outgrowths at a preliminary stage, some polyps can become the source of an outbreak of colorectal cancer.

If all cancers are due to a random cellular disorder on a gene scale, approximately five to ten per cent of cancer cases are linked to hereditary genetic abnormalities. There are scientific methods to identify some of

these defects and to evaluate the risk level of a person to be affected with a particular type of cancer. Indeed, we find that the disease occurs more frequently in certain families than in others. It is important to inform the physician about immediate family members (parents, siblings and children) who have already received a diagnosis of cancer. However, family history of cancer does not automatically imply the disease, far from it. It is rather part of the overall picture of the health of a person. Upon receiving this information, the physician may recommend screening tests before the age normally commanded.

No screening test is absolutely foolproof but an effective screening test makes it possible to reduce the mortality rate in people with cancer. Moreover, "the incidence of cervical cancer and mortality rates from this disease are declining (2.3% and 3.3% per year, respectively), largely due to widespread regular use of Papanicolaou (Pap) TEST SCREENING whereby malignant as well as pre-malignant lesions can be detected early and treated."

The **Fourth Section** of this Cancer info-kit provides, under the **Screening** item, details on testing and screening programs, in respect to colorectal cancer, breast cancer, prostate cancer and cervical cancer.

A HOLISTIC APPROACH

The cancer issue, when considered from a holistic point of view, cannot be separated from all the variables that make up the living conditions of the populations, both in regard to personal lifestyle as to the environment and society. Indeed, a large majority of the cancer cases listed (70%) are directly related to factors depending on individuals and their sociocultural and economic context.

Some risk factors such as age, gender or family history passed down from one generation to the next, are impossible to change. On the other hand, others may be more controllable, such as those related to the lifestyle or the environment. In some cases, they depend on individual choices, such as smoking, physical inactivity, the composition of the diet and the immoderate use of alcohol and drugs. In other cases, they suppose a political good-will from the governmental authorities, for example, in terms of public health protection by ensuring that the different industries' economic activities do not come at the expense of people and workers.

In addition, although a healthy lifestyle is among the solutions accessible to all, it is still necessary for each individual to become aware of that fact so he/she can adopt a consequent lifestyle. According to the World Cancer Research Fund (WCRF), 40% of cancers could be prevented if people were to adopt a healthier lifestyle. Campaigns to promote health have always been and remain essential to a higher level of well-being, for both the individuals and the collectivity. Similarly, as previously seen, screening programs play an undeniable role in lowering mortality rates in Canadian and Quebec populations, particularly in breast, prostate and cervical cancers.

However, the situation is quite different in the Aboriginal communities of Quebec. According to the standardized incidence rates and death rates for every 100,000 people, the incidence rate of prostate cancer is much lower among Aboriginals (64.8) than in the Quebec population (91.7), while the mortality rate is almost equivalent (21.1 for Aboriginal and 23.6 for all of Quebec). In the case of cervical cancer, the trend is clearer. Still according to the standardized incidence and mortality rates for every 100,000 people, the incidence rate of cervical cancer is almost three times higher among Aboriginal women (21.3) than in the female population of Quebec (8.2) and the mortality rate is four times higher (8.0 for Aboriginal women and 2.0 for Quebec). In its study *Cancer among Aboriginal people living on reserves and in Northern villages in Quebec, 1984-2004 – Incidence and mortality*, the *Institut national de santé publique du Québec* interprets these differences by the many disparities that could exist between, on the one hand, the Aboriginal people and, on the other hand, the populations in Canada and Quebec. “For example, the low incidence of prostate cancer, which occurs at a much older age, could be explained by significant premature mortality due to other causes. It should also be mentioned that

the PSA screening test is a major determinant for a large number of prostate cancer cases detected in the Quebec population. If it is found that the Aboriginal population uses this test less frequently, the result will show a lower proportion of prostate cancers detected compared to the rest of Quebec." In regard to cervical cancer, the same study shows that not only "The Human Papillomavirus (HPV) infection is now recognized as a necessary cause of cervical cancer," but that "having several children at a very young age could be associated with this cancer." It is a known fact that the rate of teen pregnancy is much higher among Aboriginal people than in the Quebec population. It is also a known fact that the lack of screening and the underutilization of the Pap test inevitably lead to an increased risk of incidence and mortality of cervical cancer.

Other explanations have been brought forward to explain the higher incidence rates of liver, lung, kidney and colorectal cancers among Aboriginal people in Quebec. It is indicated, among other things, that "exposure to cigarette smoke is implied in the etiology of many cancers, notably lung, colorectal and kidney cancer." Furthermore, "food, obesity, diabetes and lack of physical activity are among the factors associated with colorectal cancer." The study also reported that alcohol is considered a risk factor for colorectal cancer and, to a greater extent, for liver cancer. Finally, in an attempt to explain the state of cancer among First Nations and Inuit in Quebec more comprehensively, general observations were noted by the authors of the *Institut nationale de santé publique du Québec* study. They wrote that "change in the lifestyle habits of Quebec Aboriginals living on reserves and in Northern villages may explain the increased rates of cancer incidence and mortality in these populations" and "low economic status is associated with many cancers, and Aboriginal populations are very deprived."

In short, we can conclude that the development of cancer depends on numerous factors. It is linked to the affected person (for example, that person's age, family history, lifestyle), to systemic factors related to the fight against cancer (for example, the accessibility and the quality of the services of early detection, diagnosis and treatment) and sociological factors (for example, the living environment, socio-economic factors, environmental factors). The anti-cancer strategy inevitably implies a set of solutions. For the Aboriginal peoples in Quebec, the general health of the populations, as previously seen, demands a continued action to improve accessibility to health services as well as more programs promoting health, prevention and screening. This fight against cancer among the First Nations and Inuit of Quebec is precisely what this **Cancer Info-kit** is in line with.

CANCER AND DIET

As the Canadian Cancer Society likes to remind us: researchers are increasingly establishing a link between food and cancer. Foods with cancer-fighting properties include fruits and vegetables, which besides containing little fat and few calories are mineral- and vitamin-rich and high in fibre. By regulating intestinal transit, fibre helps push carcinogens through the digestive tube faster, thus reducing the risk of colorectal cancer. For their part, phytochemicals, which give fruits and vegetables their colour, act as cell-protecting antioxidants. It is even mentioned that up to 35% of all cancers can be prevented by being active, eating well and ensuring weight control.

THE EATING HABITS

A great disparity may be noted in the distribution of cancer cases around the globe. The countries of North America and Western Europe, for example, have cancer rates much higher than the Southeast Asian, African or Middle East countries. The socio-political and cultural contexts of different regions inevitably lay down some conditions that shape the lifestyles of the individuals. This relates to the field of food, which obviously does not escape this interrelationship. The study of cancer incidence among migrant populations shows that there is no *a priori* condition of cancer emergence depending on geographic data. Only the variables related to their respective contexts, such as environment and lifestyle, are at the origin of the proliferation of the cancers they are causing. There is evidence that dietary habits, in particular, affect the rate of cancer in a particular society as well as the

location of primary cancer in patients. The sudden adoption of the Western diet, for example in the case of emigrants and in the case of societies that saw an abrupt change in their culinary practices, as applies to the Aboriginals of Quebec, indicates a striking relationship between diet and the frequency of certain types of cancers. If the development of these cancers is related to the introduction of new eating habits, it is also connected to the disappearance of certain food in the consumption patterns of the individuals. Much as some foods can dramatically increase the incidence of cancer, the regular consumption of others is related, on the contrary, to the low occurrence of cancerous growth in the human body.

DEFICIENCIES OF THE WESTERN DIET

According to data from the *World Cancer Research Fund and the American Institute for Cancer Research*, a large reduction in the risk of developing cancer is associated with the consumption of foods such as fruits and vegetables, foods that also represent an important deficiency in the Westerners diet, particularly among North Americans. Moreover, since the food from these countries contains more calories, cases of overweight individuals are also much more frequent. It is now evident that the various deficiencies of the Western diet, in addition to the excesses that particularized it, represent one of the major and alarming factors of cancer occurrence. The Aboriginal people of Quebec are not immune to this threat. Subjected to the Western lifestyle, they have gradually changed their eating habits. Coupled with a difficult and expensive access to fruit and vegetables as well as an erosion of traditional eating habits, this fact may explain, in part, the increase of certain types of cancer and obesity observed in these communities over the last thirty years.

One could therefore say that Aboriginal people have somewhat increased their risk of cancer by joining the Westerners under the junk food flag. As mentioned by Dr. Denis Gingras and Dr. Richard Béliveau in their book, Westerners are facing a true avalanche of processed foods prepared on a large scale using poor quality ingredients (....) The immediate consequence of the food industrialization is that the contemporary Western diet has nothing to do with what constituted the essence of the human diet just ten generations ago: the modern diet contains at least twice as much fat, a much large percentage of saturated fat compared to unsaturated fat, barely one third of the fibre, an avalanche of sugar at the expense of complex carbohydrates and, paradoxically, a reduction of essential elements compared to the traditional diet.

THE ANTIANGIOGENIC ANTICANCER PROPERTIES

The development of cancer cells depends on blood flow in molecules from which they feed and multiply. This phenomenon, known as angiogenesis or development of new blood vessels from preexisting vessels, is essential for embryonic development, beneficial for healing wounds and to overcome the obstruction of a vessel but pathological in malignant tumour growth and metastasis development. This phenomenon can potentially be slowed or inhibited by the administration of drugs, once a cancer has been diagnosed. In fact, some nutrients have demonstrated an antiangiogenic property and so potentially, an anticancer property. These nutrients are therefore found as drugs or naturally present in some foods.

However, according to a metronomic approach, i.e. regular and over an extended period of time, it is quite possible for a body to acquire the anticancer molecules by regular ingestion of foods rich in anti-angiogenic compounds such as fruits and vegetables. This means that a balanced diet, taken before the onset of any symptoms, is an excellent prevention method, since it is a natural antiangiogenic treatment. Eating well can slow the risk of cancer appearance from the inhibition of the angiogenesis.

NUTRATHERAPY

Researchers Denis Gingras and Richard Béliveau are naming the prevention of cancer occurrence through food nutratherapy, a principle they summarize by saying that natural inhibitors found in foods can balance hereditary deficiency or those caused by bad lifestyle habits. More than just prevention, a diet rich in fruits and vegetables, for example, is in itself a continuous chemotherapy, metronomic, preventing microtumours found in the human body to become

dangerous, while not harmful to normal tissues. By their natural composition, fruits and vegetables (source of vitamins and minerals on the other hand) contain molecular compounds called phytochemicals that, in addition to being antioxidant, effectively prevent the body from becoming vulnerable to potential tumours. Among the plants that can help prevent the occurrence of cancer, there are, among others, all cruciferous vegetables (cabbage, broccoli, turnip), garlic, onion (and other vegetables of the *Allium* family), soybeans, tomatoes, berries and citrus fruit. Turmeric, some types of tea (especially green tea), dark chocolate, wine and foods high in omega-3, such as certain type of fish and some nuts, also have significant anticancer properties.

For a diet rich in these foods, which Dr. Gingras and Dr. Béliveau called *nutraceuticals*, it is possible to equip the body with regulatory elements that offset the predispositions we may have to develop certain cancers due to heredity or risk factors related to environment and lifestyle. Additional information about nutratherapy can be found by reading the book by Dr. Denis Gingras and Dr. Richard Béliveau entitled *Foods that fight cancer (Les aliments contre le cancer)* and published by Robert Rose.

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CANCER IN SUMMARY

A GENERAL EXPLANATION OF THE DISEASE

The human body is composed of billions of cells, merged into tissue and organs. Each cell contains genes that govern its growth, operation, reproduction and death. Used as a generic name, the word cancer refers to a group of diseases corresponding to a persistent and uncontrolled cell proliferation in a tissue or organ. A cancer is therefore a disease that starts in the cells. It would be possible to claim, without being wrong, that cancer is, somehow, the cell disease.

Each day, thousand of cells divide. Usually, in a healthy body, cells obey the instructions given to them. But sometimes, the instructions get confused within some cells. These cells then adopt an unusual behaviour, by developing and multiplying in an uncontrolled manner. After awhile, these groups of abnormal cells, for which control escapes the normal regulatory mechanisms of our body, can begin circulating in the blood or immune system, or form a mass called a tumour.

Tumours can be *benign* (non-cancerous) or *malignant* (cancerous). The cells forming benign tumours remain localized in one part of the body and generally are not life threatening. The cells at the origin of malignant tumours have the ability to invade surrounding tissues and spread elsewhere. Cancer cells that spread to other parts of the body are called *metastases*.

One of the first sign of this metastatic invasion is often a swelling of the lymph nodes located close to the tumour, but cancers have very diverse symptoms, depending on their location, their tissue of origin and their extension. Metastases can reach virtually all parts of the body.

It is important to detect and treat malignant tumours as soon as possible, so they will not have the time to develop metastases. A cancer is named after the part of the body where it originates.

THE DIAGNOSIS TOOLS

In most cases, it is during a consultation, while questioning the patient about symptoms experienced, that the primary care physician might suspect the presence of cancer. After checking the patient's medical and family history and after performing a clinical examination to establish a differential diagnosis that eliminates other possible causes for the symptoms, the physician uses a number of tests to confirm the diagnosis. Often, these exams go through a reference to medical specialists. Enclosed is an overview of the tests mostly used in the diagnosis of most types of cancer. Moreover, additional information can be found on all other tests relating specifically to each type of cancer in the **Fourth Section**, under the **Diagnosis** item. Finally note that the results of these exams can not only confirm but also clarify the initial diagnosis.

BLOOD ANALYSIS

From blood samples, the amount and appearance of blood cells are checked. The results of these tests can indicate to what extent the organs are functioning normally. They may also provide clues suggesting the presence or absence of cancer. For example, a blood test might show that the patient suffers from anemia due to blood loss caused by cancer or show that the blood contains a protein or a marker specific to certain types of cancer, which assists in the detection or monitoring of these cancers.

IMAGING TECHNIQUES

These techniques make it possible to carry out a thorough examination of tissues, organs and bones. X-rays, ultrasound, fluoroscopy (radioscopy), CT (Computed axial tomography) scan, MRI (Magnetic resonance imaging), PET (Positron emission tomography) scan and bone scan are all ways for the medical team to obtain an image of the tumour and to check its extension. Images can also reveal affected lymph nodes or other organs. These tests usually are painless and require no anesthesia.

BIOPSY
A biopsy is usually required to establish with certainty a diagnosis of cancer. This procedure consists in removing cells or tissues from the body in order to examine them under a microscope. There are several types of biopsy. Once the diagnosis of cancer is clearly established, the medical team must determine the stage and grade of the cancer.

HISTOLOGICAL CLASSIFICATION AND STAGING
To determine the stage of cancer, the medical team proceeded to the staging, by defining the size of the primary tumour, its histological type and its extension beyond the site where it occurred.

In addition, the evaluation under microscope of the sample taken during the biopsy makes it possible to carry out the histological classification (grade) of cancer. It is determined based on the appearance and behaviour of the cancer cells compared to normal cells. The histological classification of cancer allows the healthcare team to assess the future development of the tumour.

It is important to know the stage of the disease and grade of the tumour to select the most appropriate treatment.

VARIOUS TYPES OF TREATMENTS

In our society, a social consensus exists in regard to free choice for people with cancer. They may choose the treatment that fits their own will, which includes the refusal of any therapy, whether traditional, complementary or parallel. The Canadian Cancer Society believes however that people with cancer should have access to all available information when deciding their treatment, including, among others, information on the side effects of any treatment suggested. According to the same agency, the treatments that were confirmed by reliable scientific evidence are those offering the best chance of cure.

Traditional therapies against cancer are those currently recognized and used in the health system in Canada and Quebec. Once their safety and efficacy confirmed, they are approved by Health Canada and delivered by health professionals such as physicians, nurses and radiation therapists. Studies that made it possible to confirm these treatments lead to an improved prognosis and quality of life for people with cancer. Traditional therapies against cancer, such as surgery, chemotherapy and radiotherapy, are effective in stopping or slowing the capacity for growth and spread of cancer cells.

There are three main types of treatment: surgery, chemotherapy and radiotherapy. Very often, these different types of treatment are used in combination or sequentially. In the latter case, the excision of the tumour can be performed and, thereafter, radiotherapy or chemotherapy to eliminate residual cancer cells can be given. Sometimes chemotherapy is used prior to the surgery or radiotherapy to reduce tumour size. The treatment strategy depends on various factors such as type of cancer, tumour size and its location in the body as well as the stage of the disease and the health status of the patient.

Furthermore, health research continues to bring new treatments or even new approaches from existing treatments. Additional information about treatment related to each type of cancer can be found in the **Fourth section**, under the **Treatment** item.

SURGERY
In the history of oncology, surgery is the first treatment used against cancer. Today it remains the first-line treatment for tumours diagnosed at an early stage. The goal of surgery is to completely remove the tumour. Sometimes, to that end, the surgical oncologist must proceed with the removal of the organ where the tumour is lodged. The major limitation of surgery: not being able to eliminate all cancer cells, particularly small undetectable cells. The decision to use surgery depends on the size of the tumour, its location and surgical accessibility. During the intervention, there will be partial or total removal of the tumour and some surrounding healthy tissue. The surgery will be performed under general, regional or local anesthesia and the patient may be hospitalized for a few days after the surgery or treated in ambulatory surgery.

CHEMOTHERAPY

Chemotherapy is a foreground weapon in oncology. The administration of these drugs can target cancer cells scattered in the body that neither surgery nor radiotherapy could reach. Cancer cells grow uncontrollably. Antineoplastic chemotherapy succeeds in treating malignant tumours by using drugs acting on the cancer cells. In most cases, this treatment is a combination of chemotherapeutic drugs. Chemotherapeutic drugs can slow or even stop the development of cancer cells and thus prevent them from multiplying or invading other parts of the body.

Multiple objectives

There are different categories of chemotherapy, most often administered intravenously or orally, each aiming for specific goals:

Antineoplastic combined chemotherapy or combination chemotherapy, that target the destruction of cancer. Chemotherapy used alone or in combination with other treatments, is designed to destroy cancer cells in the body. Many types of cancer can be treated with a combination of chemotherapeutic drugs.

Neoadjuvant chemotherapy, specifically aims to shrink the size of a tumour before any other treatment. Chemotherapy is sometimes used to shrink a tumour before surgery or radiotherapy.

Adjuvant chemotherapy, specifically aims to destroy cancer cells after other treatments. Chemotherapy is often given in addition to surgery or radiation treatment to destroy cancer cells that may have been missed by the surgery or radiation.

Ablative chemotherapy, specifically aims to prepare for a bone marrow or stem cell transplant. Some cancers can be treated with bone marrow or stem cell transplant. High doses of chemotherapy are given to destroy the existing bone marrow before it is replaced by stem cells or bone marrow from a donor.

Palliative chemotherapy, specifically aims to relieve symptoms caused by cancer. Chemotherapy can be used to reduce pain and other symptoms of cancer.

Side effects

Chemotherapy is a powerful treatment that has effects throughout the body. It affects all rapidly dividing cells, such as bone marrow, the intestinal mucosa and hair follicles. This damage to healthy cells causes side effects, resulting in decreased blood cells, and sometimes diarrhea, vomiting or hair loss. Most of the time, these damages are temporary, and the healthy cells repairing themselves.

Upon initiation of chemotherapy, drugs are prescribed and recommendations provided to prevent the occurrence or minimize side effects. A drug can cause vomiting in some patients and cause only mild nausea or no nausea in others. A patient struggling with side effects or unexpected symptoms should inform their healthcare team. The team will then assess which measures need to be taken to mitigate these side effects, ranging from practical advice to a change in the cycle of treatment or dosage of medication. In some cases, other medications may be more appropriate. Furthermore, an allergic reaction to a chemotherapy drug can be life threatening. If any of the following signs occur, sudden or severe itching, rash or hives, or wheezing and difficulty breathing, the patient should go to the nearest medical emergency room. More general side effects such as anxiety, depression, changes in appetite, fatigue, repeated insomnia or disturbance of sexual life may also affect the wellbeing of the patient.

Side effects can occur at any time during the treatment. Some effects may occur during the treatment, immediately after the treatment or a few days later. Sometimes they persist after treatment has ended, the healthy cells needing some time to counteract the effect of the chemotherapeutic drugs. Side effects are variable and depend on the cycle of the prescription, the drugs ordered or how

the patient's body reacts to treatment. Side effects gradually disappear after the treatment, depending on the type of drugs and on the condition of the patient's general health.

RADIATION THERAPY

Radiation therapy, also called irradiation, is a method commonly used to treat cancer. It uses a certain type of energy (radiation) from X-rays, gamma rays, electrons and other sources to destroy cancer cells. About 50% of North American patients with cancer will be subject to this type of treatment, most of the time in combination with surgery and/or chemotherapy.

Radiation in high doses destroys cells in the area being treated by damaging the DNA in their genes, making it impossible for them to grow and divide. A radiation treatment is meant to be localized. It is applied to a specific area in order to preserve a maximum of healthy tissue. Healthy cells will not be damaged, or hardly damaged, as long as the dose of the radiation administered is determined precisely. Most healthy cells can repair themselves afterwards.

The different types of radiation therapy

There are different types of radiation that can be used in combination, depending on the treatment plan.

E*xternal beam radiation therapy* (also called *external radiation therapy*) is usually done on an outpatient basis, which means the patient won't have to stay overnight at the hospital. For many, one treatment is given each day from Monday through Friday and these treatments may continue for several weeks.

B*rachytherapy* (also called *internal radiation therapy* or *implant therapy*) makes it possible to treat the cancer with a high total dose of radiation in a concentrated area in a short period of time. In brachytherapy, sealed radioactive sources are placed in the body, in or near the cancer. A sealed radioactive source is often called an implant.

In *systemic radiation therapy* (also called *unsealed internal radiation therapy*) the radiation source is given as a liquid (either as a drink or in capsules that are swallowed) or injected into a vein (an intravenous injection). The radiation source travels throughout the body. When a systemic radiation therapy is administered, the patient needs to stay in a special room in the hospital for a number of days after the radioactive sources have been swallowed or injected. Some of the radioactive sources will be eliminated through body fluids such as saliva, sweat and urine. Systemic radiation therapy can sometimes be given on an outpatient basis. The patient will not need to stay in the hospital but certain safety measures will need to be taken at home.

Like chemotherapy, radiation therapy can be used for various purposes, in particular to destroy cancer cells, reduce tumour size before other treatments, destroy cancer cells after other treatments or relieve symptoms caused by the cancer. Because there are different types of radiation and many ways to administer them, planning the treatment is crucial. As previously mentioned, radiation must be carefully planned to aim the radiation at the specific location to be treated, while causing the least possible negative effects on healthy tissues and organs nearby.

Side effects

Side effects of radiation therapy are different from person to person and depend on several factors such as the amount of radiation received, the body part being treated, the treatment schedule, the general physical health of the patient and other medications. The side effects are caused by damage to healthy cells during treatment. They have no connection with the effectiveness of treatment.

Side effects of radiotherapy, notwithstanding the part of the body exposed to radiation, are often called general side effects. They may include anxiety, depression, changes in appetite, diarrhea, fatigue, changes in sleep patterns or disturbances in sexual life. Side effects of radiotherapy treatment related to a given region of the body are called spe-

cific side effects, such as hair loss and skin irritation similar to a burn on the treated area. In some cases, side effects, such as infertility, could be permanent.

In addition, it may happen that treatment does only minor side effects or even does not cause any. However, in case of unexpected symptoms or severe reactions, patients can contact the radiation therapy team. The staff is able to help them reduce side effects or make them more tolerable. It takes time for healthy cells to recover from the effects of radiation therapy. Some side effects may persist after treatment for several days, sometimes for weeks or even months.

COMPLEMENTARY THERAPIES

To date, scientific studies have not yet demonstrated the effectiveness of complementary treatments against cancer. However, they are included in patient care, because some evidence suggests that complementary therapies can lead to benefits in support of the traditional treatment of cancer. A complementary therapy is any practice, therapy or product that is not considered conventional medicine for cancer care. Most Canadian medical schools now provide some training in these therapies. However, they are not typically used as part of standard patient care in most physician's offices, hospitals or cancer centres. Complementary therapies are used in association with conventional cancer treatments. The purpose of a complementary therapy is not to treat the cancer itself but to help a person cope with cancer, its treatment or side effects, and to feel better. It is in fact a holistic approach focusing on the whole person. For example, acupuncture to help manage nausea caused by chemotherapy is considered a complementary therapy. The main other complementary therapies are psychotherapy, hypnosis, aromatherapy, art therapy, biofeedback, energy medicine, guided imagery, massage therapy, meditation, music therapy, tai chi and Yoga. The Canadian Cancer Society offers additional information about these complementary therapies; either by visiting its website, **www.cancer.ca** or by calling the following number: **1-888-939 - 3333**.

ALTERNATIVE THERAPIES

Alternative therapies are those used in place of conventional treatments. They are considered scientifically unproven therapies. While complementary therapies are used together with conventional treatment, alternative therapies are used instead of conventional treatment. These treatments have not been proven effective in controlled scientific studies.

CLINICAL TRIALS

Clinical trials help to find new methods for diagnosing, treating, managing and preventing cancer before they can be made available to the public. Clinical trials are essential to the study of many research topics, such as new anti-cancer drugs, new approaches to cancer prevention, screening, surgery and radiation therapy, new combinations of treatments, new ways of using standard treatments, complementary and alternative cancer therapies as well as supportive care to reduce the impact of cancer on emotions and behaviour.

Even the most promising scientific findings must first be proven to be safe and effective in clinical trials before they can be used as standard treatment. The cancer treatments that are used today were developed and tested in clinical trials. Furthermore, clinical trials give people with cancer access to the newest types of treatment. Although there is no guarantee of the outcome, the treatment being tested may prove to be as effective or more effective than the standard treatment available at this time. Several reasons can motivate patients to take part in clinical trials. Some may want a chance to feel better or even to live longer. Others feel satisfied from knowing they may be helping in the fight against cancer.

The most important aspect of a clinical trial is the protection of patient safety. That's why researchers who are conducting clinical trials must agree to follow strict procedures and follow ethical standards aimed first and foremost at protecting the health and privacy of patients in a clinical trial. One must remember that while a clinical trial may be a good choice for one person with cancer, it may not be suitable for someone else. Moreover, each clinical trial involving a new therapy or new ways of delivering an existing treatment must be approved by Health Canada, the hospital or clinic where the study takes place. Also, a research ethics board – a committee of health professionals and individuals from the community, will monitor the trial until it is completed.

A patient taking part in a clinical trial has a right to be given all the facts about a clinical trial before deciding to take part. To do so, he/she will receive a printed consent form that outlines key facts about the study and include details about the treatments, tests and any potential benefits, risks or side effects. The patient will agree to take part in the study by signing the informed consent form. Also, it is important to emphasize that each participant takes part in the clinical trial voluntarily and may leave the trial at any time. If that patient chooses to leave the trial he/she will continue to receive the best treatment possible.

THE FOLLOW-UP CARE

The follow-up care helps the healthcare team not only to monitor the health progress, but also any psychological repercussion the treatment might have had on the patient. Many oncology multidisciplinary teams may include the services of specially trained personnel such as a nurse trained to monitor the patient (nurse Navigator /Infirmière pivot in oncology or IPO). Initially, the follow-up care is managed by one of the specialists from the healthcare team. Subsequently, the family physician can take over. The schedule of follow-up visits is different for each patient. The patient might be seen more frequently in the first year after treatment, and less often after that.

The end of cancer treatment may lead to mixed emotions, such as anxiety. It is always followed by a transition period since, following the surgery and/or treatment, the patient must give himself some time before resuming a normal life. In many cases, the patient will have to make changes to his/her lifestyle and diet. In more specific cases, a period of rehabilitation could be planned even after the treatment. In all cases, the patient can count on the support of multidisciplinary teams in oncology and, primarily, on the nurses navigators over the course of the recovery period.

Along with follow-up care, patients can benefit from many kind of support provided by various community associations including the Canadian Cancer Society and the *Fondation Québécoise du cancer* (Quebec Cancer Foundation). Information about the services offered by these two entities can be found in **Annex 3** and **Annex 4** of the **Cancer Info-Kit**.

The cancer progression depends on the type of cancer, its management, and response to therapy. It may include a complete recovery, a curable relapse, a remission, metastasis to be treated, and in cases where there is no more active treatment possible, services will evolve to palliative care. It should be noted that the cure rate of the cancer is measured by the absence of tumour recurrence after five years.

THE CHALLENGE OF THE PALLIATIVE CARE

According to the Canadian Hospice Palliative Care Association, this type of care is whole-person health care that aims to relieve suffering and improve the quality of living and dying. The objective is to help patients and families prepare for and manage self-determined life closure and the dying process. It supports patients and families who must address physical, psychological, social, spiritual and practical issues, and their associated expectations, needs, hopes and fears. It helps them cope with loss and grief during the illness and bereavement. More generally, palliative care contributes to making the final stages of life an opportunity for personal and spiritual growth and personal fulfillment.

Hospice palliative care may complement and enhance disease-modifying therapy or it may become the entire focus of care. These cares are most effectively delivered by an interdisciplinary team of healthcare providers, which includes professionals with the knowledge and skills related to all aspects of the care process unique to this field, which involves the continuity of the multidiscliplinary oncology team. The caregivers may have been trained in a school, university or a recognized organization. Once they have their license to practice, they have the obligation to respect the ethical standards set forth by professional or trade associations. Additional information on palliative care can be obtained by visiting the website of the Canadian Virtual Hospice at **www.virtualhospice.ca** and the Canadian Hospice Palliative Care Association website at **www.chpca.net**. The resources for each region of Quebec can be found by accessing the Réseau de soins palliatifs du Québec (free translation: Quebec Palliative Care Network) website at **www.reseaupalliatif.org**.

4
THE MAIN TYPES OF CANCER

The fifteen types of cancer described in this section are derived from Table 5 of the *Institut national de santé publique du Québec* study, *Cancer among Aboriginal people living on reserves and in Northern villages in Québec, 1984-2004- Incidence and mortality* (see all the details in Table 5 in **Appendix 5** of the **Cancer Info-Kit**). This table shows the breakdown of the number of new cancer cases and cancer deaths among the Aboriginal people of Quebec, by cancer site and gender. The types of cancer selected thus correspond to the situation among the First Nations and Inuit of Quebec, by order of importance and frequency. In addition, most of the information found in this section comes from the Canadian Cancer Society and the Canadian Partnership against Cancer. For more information on these types of cancer, other cancers related to the same location or on any other type of cancer, visit the Canadian Cancer Society website at **www.cancer.ca**, or the Canadian Partnership against Cancer website at **www.partnershipagainstcancer.ca**, or contact the Information Service of the Canadian Cancer Society by calling the following number: **1-888-939-3333**.

LUNG CANCER

BRIEF DESCRIPTION

Lung cancer starts in the cells of the lung. The lungs are in the chest, one on each side of the heart. The right lung has three main parts, called *lobes*. The left lung is a bit smaller and has two lobes. The lungs are cushioned and protected by a thin covering called the *pleura*. The pleura has two layers of tissue: one layer covers the lungs and the other lines the inside wall of the chest. There is a small amount of fluid (*pleural fluid*) between the two layers of the pleura.

The lungs are the main organs used to breathe. The air taken in through the nose or mouth flows down the *trachea* (windpipe). The trachea divides into two tubes called the left and right bronchi, which carry air to each lung. Once inside the lung, the bronchi divide into smaller and smaller tubes called *bronchioles*. Each bronchiole ends in a cluster of tiny air sacs called *alveoli*. The alveoli take oxygen from the air breathed in and pass it into the blood for circulation to all parts of the body. The alveoli also remove carbon dioxide from the blood, which is pushed out of the lungs when exhaled. There are two main types of lung cancer. *Non–small cell lung cancer (NSCLC)* is the most common type of lung cancer. It grows more slowly than small cell lung cancer. *Small cell lung cancer (oat cell) (SCLC)* grows quickly and often spreads to distant parts of the body.

RISK FACTORS

Smoking tobacco is the main cause of lung cancer. People who live or work with people who smoke are also at increased risk because they are exposed to second-hand smoke. Other factors that increase the risk of lung cancer include: exposure to asbestos and some other substances, such as arsenic or drinking water that contains high levels of arsenic, chromium and nickel, especially in smokers; exposure to radon gas; having had lung cancer before; family history of lung cancer; air pollution. Some people develop lung cancer without any of these risk factors.

SYMPTOMS

Lung cancer often doesn't cause any symptoms in its early stages. As the cancer grows, symptoms may include:

- **a cough that gets worse or doesn't go away;**
- **breathing problems, such as shortness of breath or wheezing;**
- **constant chest pain, especially when the patient coughs;**
- **coughing up blood;**
- **a hoarse voice;**
- **difficulty to swallow;**
- **frequent chest infections, such as pneumonia, or an infection that doesn't go away;**
- **fatigue (feeling very tired all the time);**
- **unexplained weight loss or loss of appetite.**

Other health problems can cause some of the same symptoms. Testing is needed to make a diagnosis.

DIAGNOSIS

To confirm the diagnosis and the stage of the cancer, the physician will arrange special tests such as blood work, imaging studies and biopsy (see **diagnosis tools item** in the **Third Section** for more information on these tests). Moreover, in lung cancer, he/she could use sputum cytology.

SPUTUM CYTOLOGY
Samples of phlegm (called *sputum*) coughed up from the lungs are checked for cancer cells under a microscope. The physician will also ask the patient to undergo several imaging studies (for example: CT scan, PET scan, bronchoscopy) or other tests to confirm the diagnosis.

TREATMENT

SURGERY
A decision to have surgery depends on the type, the size of the tumour and its location. During the operation, all or part of the tumour and some healthy tissue around the tumour is removed. Surgery is done under general anesthesia (the patient is unconscious) and the patient must remain in the hospital for several days after the surgery. Surgery is most commonly used for non-small cell cancers that are still small and have not spread. Surgery is not usually done for small cell lung cancer unless tumours are found at a very early stage, before the cancer has started to spread.

There are many types of surgery for lung cancer. The most commonly used are described hereafter. *Wedge resection*: the surgeon removes a triangular part of the lobe containing the tumour and a small part of the lung; *segmentectomy*: a bigger part of the lobe of the lung is removed compared to the wedge resection; *lobectomy*: the surgeon removes the lobe of the lung containing the tumour. This is the most common surgery for lung cancer; *Pneumonectomy*: the surgeon removes the entire lung. The respiratory function is assured by the remaining lung; *bronchial sleeve resection*: part of the bronchus is removed; *laser surgery*: a High density light is used to destroy cancer cells or to clear a blocked airway to facilitate breathing.

It can take many weeks to recover fully from a lung operation. It is normal to have some pain or discomfort after the operation. Air and fluid may also collect in the chest. In such case, a tube will be inserted to drain the fluid. These side effects are temporary, and can be controlled. The patient will likely be given coughing and breathing exercises to do several times a day.

RADIATION THERAPY
External beam therapy and internal radiation therapy (brachytherapy) are used for lung cancer. For more information on radiation therapy and its side effects, see **Radiation Therapy item** in the **Third Section**.

CHEMOTHERAPY
Chemotherapy may be given as pills or by injection. For more information on chemotherapy and its side effects, see **Chemotherapy item** in the **Third Section**.

TARGETED THERAPY
Targeted therapies use drugs or other substances to block the growth and spread of cancer cells. These drugs are able to attack specific types of cancer cells. Targeted therapy is sometimes used to treat *non–small cell lung cancer* that has come back or that does not respond to chemotherapy. Side effects are generally mild. They may include diarrhea, rash, dry or sore mouth, nausea and tiredness. In fact, a property of targeted therapy is to limit the damage done to healthy cells.

PHOTODYNAMIC THERAPY
Photodynamic therapy uses a special drug that starts to work when exposed to light. The drug is injected into the bloodstream and absorbed by the cancer cells. When exposed to a high-energy laser light, the drug becomes active and destroys the cancer cells. Photodynamic therapy can be used to treat some cases of early-stage lung cancer. It can also be used to help relieve symptoms of a blocked airway.

SOME STATISTICS

AMONG ABORIGINAL PEOPLE OF QUEBEC
Between 1988 and 2004, 319 new cases of lung cancer have been tallied among First Nations and Inuit of Quebec, including 188 men and 131 women. As in Quebec and Canada, lung cancer is the most common type of cancer among Aboriginal people of Quebec with 23.2% of all cancer cases. As for standardized incidence rates and death rates for 100,000 people, with respect to lung cancer, the incidence is higher among Aboriginal people (106.0) than in the Quebec population (71, 9). The mortality rate is also higher among Aboriginal (86.8) compared with all of Quebec (59.8).

IN CANADA AND QUEBEC
In 2010, in Canada, an estimated 24,100 people (11,200 women and 12,900 men) will be diagnosed with lung cancer and 20,600 people (9,400 women and 11,200 men) will die from that cancer. In Quebec, 7,600 people (3,200 women and 4,400 men) will be diagnosed with lung cancer and 6,600 people (2,900 women and 3,700 men) will die from the disease. Lung cancer remains the leading cause of cancer death among both women and men.

Moreover, in Canada, in 2009*, 1 out of 11 men may have lung cancer during his lifetime and 1 out of 13 will die from it. One out of 16 women may have lung cancer during her lifetime and 1 out of 18 will die from the disease. Mortality rates from lung cancer continue to increase among women while decreasing in men. Although still high, the incidence rate appears to be levelling off in women; in men, the incidence is declining.

* Since some of this information does not change significantly, the *Canadian Cancer Statistics* will publish this data every odd year.

COLORECTAL CANCER

BRIEF DESCRIPTION

Most colorectal cancers start in the cells that line the inside of the colon or the rectum. The colon and rectum make up the large intestine (*large bowel*), namely the last part of the digestive system. Organs of the digestive system change food into energy and help pass waste out of the body. Food is digested in the stomach and the small intestine. As nutrients are removed from food, it changes into a watery mass. The watery mass passes through the small intestine into the colon, which absorbs the water and the semi-solid waste continues to travel to the rectum. This waste material is known as feces or stool. The stool is stored in the rectum. When the patient has a bowel movement, the stool leaves the body through the anus. Colorectal cancer usually grows slowly and in a predictable way. It is curable when diagnosed at an early stage.

RISK FACTORS

There is no single cause of colorectal cancer, but some factors appear to increase the risk of developing it: age – (particularly after 50); having polyps (small growths on the inner wall of the colon and rectum); family history of colorectal cancer - especially if the relative (parent, sibling, child) developed colorectal cancer before the age of 45; having familial adenomatous polyposis (FAP) or hereditary nonpolyposis colon cancer (HNPCC); inflammatory bowel disease (ulcerative colitis or Crohn's disease); diet high in red meat (beef, pork, lamb and goat); processed meat (ham, salami, sausage, hot dogs); alcohol consumption; smoking; physical inactivity; obesity; ethnic background – people of Ashkenazi (Eastern European Jewish) descent. Researchers are also looking at how diet affects the risk of developing colorectal cancer. A diet high in vegetables and fruit is known to lower risk. A diet high in fibre and low in animal fats also seems to decrease risk, but more research is necessary to be sure. Some people develop colorectal cancer without any of these risk factors.

SYMPTOMS

Colorectal cancer may not cause any signs or symptoms in its early stages because the lower abdomen has lots of room for a tumour to grow and expand. Symptoms often appear once the tumour causes bleeding or blocks the bowel. Possible symptoms of the colorectal cancer may include:

- a change in bowel habits;
- blood (either bright red or very dark) in the stool;
- diarrhea, constipation or feeling that the bowel does not empty completely;
- stools that are narrower than usual;
- general abdominal discomfort (frequent gas pains, bloating, fullness or cramps);
- unexplained weight loss;
- lack of appetite;
- feeling very tired;
- vomiting.

Other health problems can cause some of the same symptoms. Testing is needed to make a diagnosis.

SCREENING

Colorectal cancer screening means checking for colorectal cancer as part of a routine medical care when there are no symptoms present. Colorectal cancer responds best to treatment when it is found and treated as early as possible. Treatment is most effective before the disease spreads outside of the colon.

International and national experts recommend a screening colonoscopy after age 50 or sooner if an immediate family member (mother, father, brother or sister) has received such a diagnosis, 10 years younger than the age at which the diagnosis was made (e.g. if a brother was diagnosed at age 51, the recommendation would be a colonoscopy at age 41).

AVERAGE RISK INDIVIDUALS

The Canadian Cancer Society recommends that men and women ages 50 and over have a fecal occult blood test (FOBT) at least every 2 years. This test may help identify polyps before they become cancerous or a tumour at an early stage. Any positive result, meaning that blood was found in the stool, requires additional testing as described later on in the **Diagnosis/the other exams**.

HIGH RISK INDIVIDUALS

Those who are at a higher than average risk of developing colorectal cancer should discuss an individual plan of surveillance with their physician. High risk individuals include those with a first-degree relative with colorectal cancer (such as a parent, sibling or child); a personal history of colorectal cancer; inflammatory bowel disease such as ulcerative or Crohn's disease; some inherited syndromes such as FAP (familial adenomatous polyposis) or HNPCC (hereditary non-polyposis colon cancer); benign polyps of the colon or rectum.

FECAL OCCULT BLOOD TEST (FOBT)

Research has shown that people who undergo the fecal occult blood test (FOBT) regularly are more likely to survive a colorectal cancer. FOBT checks for blood in the stool that is not visible to the naked eye (occult blood). The surfaces of the polyps as well as tumours of the colon are indeed covered with blood vessels likely to release a small amount of blood in the stool. The test helps to prevent cancer by helping discover polyps that can be removed before becoming cancerous. Moreover, early detection of colorectal cancer can also reduce the duration of treatment and convalescence.

Two types of FOBT are used in screening for colorectal cancer in Canada. Guaiac-based FOBT, the most common type of FOBT, uses a chemical reaction on a paper card to find traces of blood in the stool. It can be done at home. Fecal immunochemical test (FIT, iFOBT) uses specific antibodies to find traces of blood in the stool. This newer type of FOBT is used by some screening programs in Canada.

Finding blood in the stool isn't always a sign of cancer. The blood found in the stool may come from the colon or other parts of the digestive tract, such as the stomach or anus The bleeding can be caused by ulcers (sores on the mucous membrane lining the digestive tract), hemorrhoids (enlargement or swelling of the veins in the anus and rectum), diverticulosis (tiny pouches forming in weaknesses of the colon wall), in inflammatory disease of the bowel (colitis), polyps (non-cancerous tissue growth that can turn into cancer). Generally, if the FOBT shows traces of blood, more testing, such as a colonoscopy, double contrast barium enema (an x-ray of the large intestine), or a sigmoidoscopy will be necessary to find out the origin and cause of the bleeding.

SCREENING PROGRAM IN QUEBEC AND CANADA-WIDE STILL UNSEEN

Across Canada, colorectal cancer is globally the second leading cause of mortality. It follows lung cancer in this unfortunate record. The Canadian Cancer Society and several other organizations, such as Coalition Priorité Cancer (free translation: Priority Cancer Coalition) in Quebec, considered the scientific evidence sufficient to justify the fastest possible development of a screening program for colorectal cancer across Canada. Any screening program for colorectal cancer should ensure that people whose tests confirm the presence of occult blood in stool samples can rapidly undergo other diagnostic tests. Such program already exists in Ontario and Manitoba.

DIAGNOSIS

BASIC TESTS

If, after completing a physical examination, including an examination of the abdomen and pelvis and a rectal exam, the physician suspects a colorectal cancer, he/she will arrange for special tests to confirm his/her diagnosis. Blood test, imaging studies and biopsies are among such tests (more information on these tests is available in the **Third Section**, under the **Diagnosis tools item**.)

OTHER TESTS

For colorectal cancer, the physician may use various tests to confirm his/her diagnosis. These other tests are colonoscopy, barium enema double contrast (x-ray of the large intestine), sigmoidoscopy, ultrasound, CT scan and virtual colonoscopy.

Colonoscopy: a procedure that lets the physician look at the lining of the entire colon, beyond the rectum and lower colon. A colonoscope is a flexible, lighted tube (endoscope) inserted through the rectum. If the physician observes something abnormal, tissue samples (called a biopsy) may be taken during a colonoscopy. Polyps can also be removed during this test. Drug can be given to the patient to alleviate discomfort caused by the test.

Double-contrast barium enema: barium, a special coloring substance, is given as an enema through a small plastic tube inserted through the anus into the rectum. Barium coats the inside of the bowel and shows its outline clearly on an x-ray. Biopsies cannot be taken during this test. This test is a very useful diagnosis method for colorectal cancer but must be validated by a colonoscopy.

Flexible sigmoidoscopy: a procedure that lets the physician examine the lining of the rectum and the lower part of the colon, called the sigmoid, take biopsies and remove polyps. A flexible sigmoidoscope is a soft, bendable tube inserted into the rectum and lower colon. The test can be performed in the physician's office or at a clinic. If the patient so desires, drugs can be given to alleviate discomfort caused by the test.

Digital rectal examination (DRE): The physician inserts a gloved finger into the rectum to feel for abnormalities. Biopsies cannot be taken during this test. The rectal examination is recommended for anyone 50 years or older for the screening of anorectal cancer.

TREATMENT

SURGERY
A decision to have surgery depends on the size of the tumour and where it is in the intestine. During the operation, all or part of the tumour and some healthy tissue around the tumour are removed. Surgery is done under general anesthesia and the patient may stay in the hospital for a few days after the surgery. Very small tumours may be removed by inserting a tube through the rectum. For larger tumours it may be necessary to remove the piece of intestine containing the cancer. The surgeon may be able to sew the healthy parts of the intestine together. If this isn't possible, the colon will be brought through an opening in the abdomen. This lets the body's waste pass directly from the colon through the opening in the skin and into a bag that can be emptied regularly. This is called a colostomy. A colostomy may be permanent or the patient may need it only until the rectum heals. Most people learn to manage a colostomy very well and continue to enjoy life as before. After surgery the patient may have some pain or nausea, or may not feel like eating. These side effects are temporary and can be controlled.

RADIATION THERAPY
Radiation therapy can be applied for both colon and rectal cancer, but is more commonly used for rectal cancer. It is sometimes given after surgery to reduce the risk of the cancer returning or preoperatively for more advanced rectal tumours. For more information on radiation therapy and its side effects, see **Radiation Therapy item** in the **Third Section**.

CHEMOTHERAPY
Chemotherapy may be given as pills or by injection. Chemotherapy is sometimes used after surgery to reduce the risk of the cancer returning. For more information on chemotherapy and its side effects, see **Chemotherapy item** in the **Third Section**.

BIOLOGICAL THERAPY
New and promising biological therapies are being used to treat some stages of colorectal cancer. Biological therapy is a treatment that uses the immune system to fight cancer or to help control side effects of other cancer treatments. Natural body substances are used to boost the body's own defenses against illness. Some biological drugs can target specific cells without damaging healthy cells. Possible side effects of the biological therapy may include rashes or swelling where the treatment is injected, flu-like symptoms or lowered blood pressure.

SOME STATISTICS

AMONG ABORIGINAL PEOPLE OF QUEBEC

Between 1988 and 2004, 181 new cases of colorectal cancer have been tallied among the First Nations and Inuit of Quebec, including 100 women and 81 men. As for Canada and Quebec, this cancer ranks second among the Aboriginal people of Quebec, by type of cancer and for both genders, with 13.1% of all new cancer cases listed and 8.0% of all cancer deaths recorded. According to the standardized incidence rates and mortality for 100,000 people, the incidence rate of colorectal cancer is slightly higher among Aboriginals (56.5) than in the general population of Quebec (54.3), while the mortality rate is significantly lower (16.8 Aboriginals and 24.6 for all of Quebec).

IN CANADA AND QUEBEC

In 2010, in Canada, an estimated 22,500 people (10,100 women and 12,400 men) will be diagnosed with colorectal cancer and 9,100 people (4,100 women and 5,000 men) will die from that cancer. In Quebec, 5,900 people (3,300 men and 2,600 women) will be diagnosed with colorectal cancer and 2,500 people (1,350 men and 1,150 women) will die from the disease. Colorectal cancer is the second cause of cancer death among both women and men. On average, each week, 423 Canadians (male or female) will be diagnosed with colorectal cancer and 175 other Canadians will die from the disease.

Moreover, in Canada, in 2009*, 1 out of 14 men may have colorectal cancer during his lifetime and 1 out of 27 men will die from it. One out of 15 women may have colorectal cancer during her lifetime and 1 out of 31 will die from the disease. The incidence rate of colorectal cancer in both genders increased between 1980 and 1985, then declined until the mid-90s (this is more pronounced among women than among men). The incidence rate climbed again until 2000 and thereafter showed a significant decrease (especially in men). Mortality rates are declining for both genders.

* Since some of this information does not change significantly, the *Canadian Cancer Statistics* will publish this data every odd year.

BREAST CANCER

BRIEF DESCRIPTION

Breast cancer starts in the cells of the breast. It can affect not only the breast tissue but also the body part that extends up to the collarbone and from the armpit across to the breastbone in the centre of the chest. The breasts sit on the chest muscles that cover the ribs. Each breast is made up of glands, ducts (thin tubes) and fatty tissue.

The breasts also contain lymph vessels and lymph nodes, which are part of the lymphatic system. The lymphatic system helps fight infections. Lymph vessels move lymph fluid to the lymph nodes. Lymph nodes trap bacteria, cancer cells and other harmful substances. There are groups of lymph nodes near the breast under the arm, near the collarbone and in the chest behind the breastbone.

Cancer cells may start within the ducts (this is called *ductal carcinoma*) or in the lobules (*lobular carcinoma*). Ductal carcinoma is the most common type of breast cancer. Other types of breast cancer, such as inflammary breast cancer and Paget's disease, behave differently and may need different treatment.

INFLAMMATORY BREAST CANCER

Inflammatory breast cancer is an uncommon but aggressive type of breast cancer that can grow and spread quickly even at a relatively early stage of the disease. This type of cancer can develop when breast cancer cells block the lymph vessels that remove fluids, bacteria and other waste products from breast tissue. As a result, the breasts can become inflamed. Unlike the most common types of breast cancer that develop one or more single solid tumours, inflammatory breast cancer tends to grow in layers or nests. This aspect is often mistaken for an infection.

Symptoms of inflammatory breast cancer can appear suddenly and vary from person to person. The main symptoms are: a change in the size or shape of the breast (breast size may increase over a short period of time, some women report an increase of their bra size by a full cup size in just a few weeks); breasts that are warm or hot to the touch; a change in the normal color or texture of the breast (skin on the breast or patches of skin may appear red, pink, or appear bruised for no known reason.); itchy breasts not relieved by ointments or creams; sudden appearance of a lump in the breast (however, because inflammatory breast cancer tends to grow in layers instead of forming a solid tumour, a person with this type of breast cancer may not necessarily feel a lump in the breast); swollen lymph nodes under the arm or above the collarbone; nipple discharge.

The symptoms of inflammatory breast cancer can be similar to an infection of the breast (mastitis), which can be effectively treated with antibiotics. Symptoms that do not go away in spite of antibiotic treatment should be discussed with a physician. Further testing to rule out inflammatory breast cancer may be needed.

A biopsy of the breast is the most reliable diagnostic tool for inflammatory breast cancer. Inflammatory breast cancer is not often detected by a mammogram or ultrasound, these exams can however help evaluate the extent of the disease or other pathologies (e.g. Infection with abscess). Treatment often begins right away because inflammatory breast cancer can spread quickly. Treatment usually includes a combination of chemotherapy, surgery, radiation and hormonal therapy. Because inflammatory breast cancer cells grow widely through the tissues of the breast, rather than as a single tumour, chemotherapy is often given before surgery or radiation treatment.

BREAST CANCER IN MEN

Men have breast tissue just like women, and can develop breast cancer. In Canada, less than 1% of all breast cancers occur in men. Breast cancer is most commonly diagnosed in men over 60, but can be found in men of all ages. As breast cancer is the same for both men and women, the information about risk factors, diagnosis, staging, and treatment are the same for both. The most frequently diagnosed kind of breast cancer in men is found in the breast ducts (ductal carcinoma). Common symptoms are: a small, painless lump close in the breast and a small discharge from the nipple. However, it's important to remember that most breast problems are not breast cancer. Only a visit to a physician will help find out what the problem is and if it needs treatment.

RISK FACTORS

Most women who develop breast cancer have no risk factors other than simply being a woman and getting older (especially being over 50). Family history of breast cancer is not the only risk factor. There are programs and screening tests to rapidly diagnose breast cancer, as we shall see later. Only a small number of women are at high risk for breast cancers, mostly due to a genetic or a strong family history. Women belonging to this group have the possibility to pass tests at a younger age or more frequently than the average, undergo genetic risk assessment, get a preventive treatment (prophylactic) such as taking anti-estrogenic drug or prophylactic surgery.

HIGH RISKS

The most common risk factors are: having had breast cancer before; a family history of breast cancer (especially if a mother, sister or daughter diagnosed before menopause or if mutations on BRCA1 or BRCA2 genes are present); family history of ovarian cancer; a history of breast biopsies showing certain breast changes such as an increased number of abnormal cells that are not cancerous (atypical hyperplasia) and radiation treatment to the chest area (for example, to treat Hodgkin lymphoma), especially before age 30.

OTHER RISKS

Other risk factors for breast cancer include: dense breast tissue (as shown on a mammogram); an above-average exposure to the hormone estrogen, which the body naturally produces, perhaps because the patient has never given birth or gave birth for the first time after age 30, began menstruating at a young age, reached menopause later than average, have taken hormone replacement therapy (estrogen plus progestin) for more than five years. Some factors slightly increase the risk of breast cancer, in particular being obese (especially after menopause), alcohol consumption, taking birth control pills (the Pill). Some women develop breast cancer without having any of these risk factors. Most women with breast cancer do not have a family history of the disease.

SYMPTOMS

Remember, lumps in the breast are very common, especially just before a woman's period. Most often breast cancer is first noticed as a painless lump in the breast. A woman practicing breast self-examination may discover the lump, or her physician may find it during a routine physical exam or screening mammogram. Other signs might include:

- lump or swelling in the armpit;
- changes in breast size or shape;
- dimpling or puckering of the skin – thickening and dimpling skin is sometimes called orange peel);
- redness, swelling and increased warmth in the affected breast;
- inverted nipple – nipple turns inwards;
- a deviated nipple;
- crusting or scaling on the nipple;
- an ulceration of the nipple;
- a nipple discharge, spontaneous or bloody.

Often, these symptoms are not caused by cancer. Other health problems can cause them. Testing is necessary to make a diagnosis.

SCREENING

BREAST SELF-EXAMINATION

Many women are alive and healthy today because their breast cancer was detected and treated early. Breast health starts with good knowledge of one's own anatomy, and this, regardless of age. Many women are the first to discover their breast cancer after observing changes in appearance or feel of their breasts. Breast tissue covers a large enough region, in height, up to the clavicle and, in width, from the armpit to the middle of the sternum, the center of the chest. The breasts rest on the chest muscles that cover the ribs.

The breast self-examination simply involves looking and feeling the breasts. Recent studies have shown that it is not necessary to follow a particular method every month, at the same time. There is no real right or wrong way to examine the breasts – the important thing is to adequately explore the whole region where the breast tissue is located up to the collarbone and the armpit, without forgetting the nipple, so as to notice any changes. The important thing is for a woman to learn to recognize what is normal for her own breasts in a manner that best fits her personality. It may be normal for breasts to be sensitive or granular just before menstruation. Breast tissue also changes with age. It is therefore essential, first and foremost, for a woman to learn about the specifics of her breasts so she can detect changes that must be reported to the physician. Furthermore, clinical breast exams and mammograms remain the most reliable methods for detecting breast cancer.

CLINICAL BREAST EXAMINATION (CBE)

Clinical breast examination (CBE) is a physical examination of the breasts by a trained health professional. Regular clinical breast examinations can help detect cancer early. Women who are over the age of 40 should have a CBE every year. Any woman with a higher than average risk of developing breast cancer, as indicated in the **high risk item**, will most likely be screened more often or earlier (before age 40).

SCREENING MAMMOGRAM

Screening mammograms are done in a clinic or screening centre. A mammography exam is a low-dose x-ray. Mammography pictures (mammograms) show detailed images and views of the breast taken from different angles. The breast is placed between two plastic plates that are then pressed together to flatten the breast. This may be uncomfortable, but it lasts only a few seconds. Compressing the breast tissue helps make the images clearer while using as little radiation as possible. Some types of cancer are hard to detect with the mammogram.

QUEBEC BREAST CANCER SCREENING PROGRAM (PQDCS)

The goal of the Québec breast cancer screening program is to reduce mortality due to breast cancer by at least 25% among women ages 50 to 69, over a ten-year period. The women in this age group can make an appointment at a designated screening center without prior recommendation from a physician. In addition, a personalized letter is addressed to women 50-69 years old, inviting them to undergo a mammography in a designated and certified screening center. Each woman is given her examination's result by letter. If the result is normal, a systematic recall is made, every two years, for a repeat mammogram. However, for the abnormal results cases, centres with a multidisciplinary team offering the full range of diagnostic facilities are so designated.

In short, breast cancer screening can be summarized as follows: women between 40 and 49 should discuss with their physician about their personal risk factor for breast cancer and undergo a breast clinical exam, performed by a health professional, every year; women between 50 and 69 years of age should have the same physical exam performed every year and a mammogram every two years; women over 70 years should ask their physician what kind of screening testing is recommended for them.

DIAGNOSIS

The physician most likely suspected that a breast cancer because a routine screening mammogram showed a problem, or after examining the breasts and talking with the patient about her health and her personal and family medical history, or, finally, when the patient reported a change in her breast or nipple. In the earliest stage of breast cancer, cancer cells are found only in the milk ducts or lobules. This is called *in situ* cancer. If *in situ cancer* is diagnosed before the cells have spread to the surrounding tissue, there is no risk of them spreading after they have been removed. When breast cancer spreads out of the duct or lobule, it is called invasive cancer. It can still be treated effectively if diagnosed early.

To confirm the diagnosis, the physician will arrange special tests. These diagnostic tests are: blood testing, imaging studies, and biopsy (see **diagnostic tools item** in the **Third Section** for more information on these tests).

IMAGING STUDIES

A diagnostic mammogram will be performed if a screening mammogram is considered abnormal. During a diagnostic mammogram, more x-ray pictures will be taken of the areas in the breast that appeared abnormal on the screening mammogram. Other imaging studies might be required, from a breast ultrasound in order to confirm if the abnormality found in the breast is a cyst or a solid tumour to a preoperative bone scan to evaluate the extent of the disease.

BIOPSY

There are several kinds of breast biopsies. A *fine needle aspiration* uses a thin needle to remove fluid or cells from the lump. This procedure is quick, but it may be uncomfortable because the breast is so sensitive. For a *core needle biopsy*, the physician inserts a needle through a small cut in the breast to remove one or more samples of breast tissue. If necessary, ultrasound or x-ray imaging is used to guide the needle into the lump. For this biopsy and the following ones, a local anesthetic (freezing) is used to numb the area. There may be some breast tenderness and bruising for a short time afterwards. A *surgical biopsy* is an operation to remove part or all of a breast lump or suspicious breast tissue. There are two types of surgical biopsies. An *incisional biopsy* takes a sample of a lump or abnormal area. An *excisional biopsy* takes out the entire lump or all the suspicious tissue. The biopsy can be performed in the physician's office or in the hospital as an outpatient, which means there is no overnight stay.

LABORATORY TESTS

If cancer cells are found in the biopsy sample, the physician may order more laboratory tests on the breast tissue that was removed. These tests help him/her learn more about the cancer and plan the best treatment options for the patient. For example, the *hormone receptor status test* shows whether the cells have certain hormone receptors. Breast cancer cells that have these receptors need estrogen and progesterone hormones to grow. If the biopsy sample has these receptors, the tumour is called *hormone positive*. Knowing the hormone receptor status of the tumour helps predict how the tumour will behave and whether or not the cancer is likely to respond to hormonal therapy. Hormone-positive tumours are more common in post-menopausal women.

The *Her2* test looks for the cancer gene that controls the Her2 protein. *Her2* stands for human epidermal growth factor receptor 2. *Her2* is a protein on the surface of breast cells that promotes growth; some breast cancer cells have a lot more *Her2* than others. If the tissue has too much *Her2* protein or too many copies of the gene that controls it, the tumour is called *Her2 positive*. *Her2-positive* breast cancers behave differently than other breast cancers and need specific treatment.

TREATMENT

SURGERY

Surgery is the most recommended treatment for breast cancer. The decision about what type of surgery to have depends on the size of the tumour and its location as well as the stage of the disease. There are 2 different types of breast surgery: a breast-conserving surgery (lumpectomy), which means the removal of a lump and some tissue, but not the whole breast ; or the removal of the whole breast (mastectomy).

During surgery, the physician will usually remove some lymph nodes from the armpit to see if the cancer has spread. This is called an axillary dissection. A newer procedure called sentinel lymph node biopsy, which may mean fewer lymph nodes are removed may also be performed. After surgery there may be some pain or nausea, or a lack of appetite. These side effects are temporary, and can be controlled. Any change in how the breast looks after surgery depends on the amount of breast tissue that is removed and the location of the tumour. In some cases the patient may have the option to have breast reconstruction done at the same time as the surgery. In other cases, the reconstruction will be performed later. If lymph nodes are removed from under the arm, lymph fluid may build up in the arm and hand and cause swelling. This is called lymphedema. Lymphedema can happen soon after surgery, or months or even years later.

RADIATION THERAPY

External beam radiation therapy is almost always given after breast-conserving surgery to destroy any cancer cells that may remain in the breast area. In some cases, the lymph node area is treated as well. The nipple and the fold under the breast may be sensitive or sore. These side effects are a result of damage to normal cells; they will usually lessen when the treatment period is over and the normal cells repair themselves. Radiation to the armpit may increase the risk of lymphedema. Radiation is sometimes used after a mastectomy. For more information on radiation therapy and its side effects, see **Radiation Therapy item** in the **Third Section**.

CHEMOTHERAPY

Chemotherapy may be given as pills or by injection. Some chemotherapeutic drugs can affect the ability to become pregnant. A patient planning to have children after treatment must discuss her options with her physician. For more information on chemotherapy and its side effects, see **Chemotherapy item** in the **Third Section**.

HORMONE THERAPY

Hormones are chemical substances that are produced by glands in the body or made in a laboratory. Hormonal therapy is a treatment that removes hormones from the body or blocks their action and stops cancer cells from growing. Drugs, surgery or radiation therapy can be used to change hormone levels. If a tumour is hormone receptor positive, the physician may offer hormonal therapy. Hormonal drugs can be given as pills or injections, or both. Different drugs cause different side effects. The patient might notice menopause-like symptoms, such as irregular periods, hot flashes, vaginal discharge or irritation. These effects can usually be reduced or controlled. They often go away when therapy is finished, but sometimes menopause is permanent.

BIOLOGICAL THERAPY
Biological therapy for breast cancer uses drugs to interfere with how breast cancer cells grow and uses the body's immune system to destroy cancer cells. Biological therapy may be used for women whose breast cancer has too much of the Her2 protein. To counter this abnormal cell activity found in 15 to 20% of this type of breast cancer, the women are prescribed Herceptin, an antibody designed to target and block the function of the Her2. The goal of this treatment is to improve survival rates and especially avoid a potential cancer recurrence. The medication is given by injection and may be given with chemotherapy. Side effects may include flu-like symptoms (fever, chills, nausea), headache, rash or heart problems.

SOME STATISTICS

AMONG ABORIGINAL PEOPLE OF QUEBEC
Between 1988 and 2004, 119 new cases of breast cancer have been tallied among First Nations and Inuit women of Quebec, which represents 17.3% of all new cancer cases identified in Aboriginal women of Quebec. Breast cancer is the second most common type of cancer among Aboriginal women, the first being lung cancer. Twenty-six (26) women died from breast cancer. This number represents 9.1% of the cancer deaths among women. According to the standardized incidence rates and mortality for 100,000 people, the incidence rate of breast cancer is slightly lower among Aboriginals (65.7) than in the general population of Quebec (102.8), while the mortality rate is significantly lower (14.3 among Aboriginals and 30.0 for all of Quebec).

IN CANADA AND QUEBEC
Breast cancer is the most common type of cancer among Canadian and Quebec women (excluding skin cancer other than melanoma). In 2010, in Canada, an estimated 23,200 women will be diagnosed with breast cancer and 5,300 will die from that cancer. In Quebec, 6,100 women will be diagnosed with breast cancer and 1,400 women will die from the disease. On average, 437 Canadian women learn they have breast cancer each week and 104 will die from the disease. It is estimated that 1 out of 9 Canadian women will be diagnosed with breast cancer in her lifetime. One out of 28 Canadian women will die from it. The incidence rate for breast cancer has decreased for all age groups since the mid-90s. In women ages 20 to 39, the incidence rate and mortality rate have been declining since 1969.

PROSTATE CANCER

BRIEF DESCRIPTION

Prostate cancer starts in the cells of the prostate gland, which is part of the male reproductive system. Its main function is to make part of the liquid (seminal fluid) that mixes with sperm from the testicles to make semen. Semen is ejaculated during sex. The prostate is about the size of a large walnut. It is located close to the rectum just below the bladder at the base of the penis. The prostate surrounds the urethra, the tube that carries urine and semen through the penis. Prostate cancer is the most common cancer in Canadian men. It usually grows slowly and can often be cured or managed successfully.

RISK FACTORS

There is no single cause of prostate cancer, but some factors appear to increase the risk of developing it. The risk of prostate cancer increases as men grow older. Having these risk factors doesn't mean that the patient will develop prostate cancer. It means that the chances of developing it are higher. The **most important risk factors** are: being older than 65; family history of prostate cancer; African ancestry.

Obesity, physical inactivity, eating a diet that is high in fat, and working with a metal called cadmium are being studied as possible risk factors. Eating a diet high in calcium is being studied as a possible risk factor. Calcium has many health benefits, and research so far tells us that the levels of calcium have to be very high – much higher than in the average man's diet – for it to be a concern. It is possible to develop prostate cancer without having any of these risk factors.

SYMPTOMS

Prostate cancer may not cause any signs or symptoms, especially in the early stages. It may be found with a PSA (Prostate Specific Antigen) test or digital rectal examination. Symptoms may appear if the tumour makes the prostate larger than normal and it starts to press on the urethra. This can make passing urine more difficult, painful or frequent.

As a man gets older, the prostate may become enlarged and block the urethra or bladder. This is a common condition called benign prostatic hyperplasia (BPH). BPH is not cancer, but the symptoms of BPH are similar to the symptoms of prostate cancer. Testing is needed to confirm a diagnosis.

Signs and symptoms for prostate cancer are:

- need to urinate often, especially at night;
- intense need to urinate (urgency);
- difficulty in starting or stopping the urine flow;
- inability to urinate;
- weak, decreased or interrupted urine stream;
- a sense of incompletely emptying the bladder;
- burning or pain during urination;
- blood in the urine or semen;
- trouble ejaculating;
- painful ejaculation;
- pain;
- impairment of the general condition.

SCREENING

Men over 50 should ask their physician whether they should have a screening test for prostate cancer. Men in the groups with higher risks should seek to have screening tests done regularly and, in appropriate cases, even before the age of 50.

Prostate cancer can be detected early using a PSA test and a digital rectal exam (DRE) but these may also ignore an existing cancer or give false alarms. In some cases, these tests will detect a prostate cancer that is not a serious health threat. Some prostate cancers grow very slowly and can be present in a patient's body for years without having any effect on that patient's health. If the DRE or PSA test reveals abnormalities, the physician may recommend other tests to rule out or confirm a diagnosis of prostate cancer.

DIAGNOSIS

When suspecting a prostate cancer, most likely after having performed a digital rectal examination (DRE), the physician will arrange special tests to confirm his/her diagnosis. The patient will then have one or several of the following tests: blood tests, Imaging studies, and biopsy (see **diagnosis tools item** in the **Third Section** for more information on these tests).

BLOOD TESTS

It is possible to test the blood for a substance called *Prostate-Specific Antigen* (PSA). If the patient has an enlarged prostate, the amount of PSA in the blood may be slightly higher than normal. Prostate cancer usually causes even higher levels of PSA in the blood than an enlarged prostate does. If the PSA level is higher than expected for the patient's age, more tests will be done to find out whether this is because of prostate cancer or another prostate problem. Other blood tests may be done to check the patient's general health.

IMAGING STUDIES

A *transrectal ultrasound* (TRUS) is usually the only imaging study needed to diagnose prostate cancer. A TRUS uses sound waves to form a picture of the prostate. The physician inserts a small probe into the rectum and looks for dark or dense areas on the image that may represent cancer. A sample of cells (called a biopsy) is taken at the same time. This test may be slightly uncomfortable, but it does not last long.

BIOPSY

A prostate biopsy is usually taken during a transrectal ultrasound (TRUS); several samples of prostate cells are removed through the rectum. Some patients may feel a brief sharp pain during the procedure however a local anesthetic (freezing) can be used to lessen the discomfort.

TREATMENT

Some prostate cancers are very slow growing and can be present for years without affecting the patient's health. Thus, in prostate cancer, four (4) treatment options may be considered depending on the stage of the cancer, the patient's age, health status and preferences either watchful waiting (active surveillance), surgery, radiotherapy or chemotherapy.

ACTIVE SURVEILLANCE

The physician will examine the patient's prostate and test his PSA levels regularly. A TRUS or biopsy may be done from time to time. Immediate treatment may be considered only if signs of cancer appear or change. If immediate treatment is recommended, one or more of the following treatments options might be chosen.

SURGERY

A decision to have surgery depends on the stage and grade of the cancer, the patient's general health and his PSA level. During the operation, the entire prostate will be removed. This is called a prostatectomy. Some nearby tissue may also be affected by the surgery. Surgery is done under general anesthesia and the patient may stay in the hospital for several days after the surgery. After surgery, the patient will have a narrow tube called a catheter in his bladder, but this is usually removed within a few days. The patient may have some pain or nausea, or may not feel like eating. These side effects are temporary and can be controlled. Surgery to the prostate can damage the nerves that control the ability to have or keep an erection (impotence). When possible, nerve-sparing surgery will be used to try to avoid nerve damage. After prostate surgery the patient may have problems controlling his bladder (incontinence). Problems with incontinence usually improve with time.

RADIATION THERAPY

Radiation for prostate cancer may irritate the rectum and cause changes to the bowel movements. The patient may also need to pass urine more often. These side effects are a result of damage to normal cells. The side effects will usually improve or go away when the treatment period is over and the normal cells repair themselves. Also, radiation may damage the nerves and blood vessels in the penis, which can result in erectile difficulties. For more information on radiation therapy and its side effects, see **Radiation Therapy item** in the **Third Section**.

HORMONAL THERAPY

Hormonal therapy is a treatment that removes or blocks hormones and stops cancer cells from growing. Prostate cancer needs the male hormone testosterone to grow. Hormonal therapy gets rid of testosterone or lowers the level of testosterone in the body to slow the growth of the tumour and shrink it. The level of testosterone in the body can be lowered by surgically removing the testicles (bilateral orchiectomy) or by using drugs. Hormonal drugs can be given as pills or injections, or both. Today, it is more common to use drugs to lower testosterone than it is to remove the testicles.

Hormonal drug therapy may cause some side effects in some men. Different drugs cause different side effects, such as hot flashes, impotence, loss of desire for sex, weight gain or breast tenderness. Bones may become weaker. These effects can usually be reduced or controlled. They often go away when therapy is finished. If both testicles are removed, impotence and loss of sex drive are permanent.

CHEMOTHERAPY

Chemotherapy may be given as pills or by injection. Chemotherapy is not used to treat cancer of the prostate in the early stages of the disease. For more information on chemotherapy and its side effects, see **Chemotherapy item** in the **Third Section**.

SOME STATISTICS

AMONG ABORIGINAL PEOPLE OF QUEBEC

Between 1988 and 2004, 88 new cases of prostate cancer have been tallied among First Nations and Inuit men of Quebec, which represents 12.7% of all new cancer cases identified in Aboriginal men of Quebec. Prostate cancer is the second most common kind of cancer among Aboriginal men of Quebec, the first being lung cancer. Twenty-eight (28) men died from prostate cancer, which represents 7.7% of the cancer deaths among Aboriginal men. According to the standardized incidence rates and mortality for 100,000 people, the incidence rate of prostate cancer is significantly lower among Aboriginals (64.8) than in the general population of Quebec (91.7), while the mortality rate is almost the same (21.1 among Aboriginals and 23.6 for all of Quebec).

IN CANADA AND QUEBEC

Prostate cancer is the most common type of cancer among Canadian and Quebec men (excluding skin cancer other than melanoma). In 2010, in Canada, an estimated 24,600 men will be diagnosed with prostate cancer and 4,300 will die from that cancer. In Quebec, 4,700 men will be diagnosed with prostate cancer and 870 men will die from the disease. On average, 490 Canadian men learn they have prostate cancer each week and 85 will die from the disease.

It is estimated that 1 out of 7 Canadian men will be diagnosed with prostate cancer in his lifetime (the risk being higher after 60 years). One out of 27 Canadian men will die from it. Overall, the incidence rate of prostate cancer has increased since 1980, probably due to early screening or changes in the risk factors. The mortality rate has slowly increased over the same period of time and started declining in the mid-90s.

KIDNEY CANCER

BRIEF DESCRIPTION

Kidney cancer starts in the cells of the kidney. The two kidneys are found on either side of the backbone, deep inside the upper part of the abdomen, protected by the lower ribs. Attached to the top of each kidney is an *adrenal gland*. The kidneys make urine by filtering water and waste material from the blood. Urine passes from each kidney to the bladder through tubes called the ureters. When the bladder is full, the urine passes out of the body through a tube called the urethra.

There are several types of kidney cancers, the most frequent is the renal cell carcinoma. Information about other kidney cancers (such as transitional cell cancer and Wilms' tumour) can be obtained by calling the *Cancer Information Service* of the Canadian Cancer Society at: **1-888-939-3333**.

RISK FACTORS

Kidney cancer is more common in men than in women and is most often found in people over 50 years of age. There is no single cause of kidney cancer, but some factors increase the risk of developing it such as smoking, being overweight, African ancestry, genetic conditions such as von Hippel-Lindau (VHL) disease, long-term dialysis, exposure to the solvent trichloroethylene, long-term or heavy use of certain painkillers (phenacetin-based analgesics), high blood pressure (hypertension) or drinking water that contains high levels of arsenic. People who come in contact with coke (used in steel production), asbestos or cadmium may have a higher risk of getting kidney cancer. Some people develop kidney cancer without any of these risk factors.

SYMPTOMS

Often the first symptom of kidney cancer is blood in the urine (called *hematuria*). The blood can change the colour of the urine to anything from slightly rusty to bright red. Other possible symptoms of kidney cancer include:

- pain in the back and side that does not go away;
- a lump in the side or the abdomen;
- unexplained weight loss;
- fever;
- headaches if associated with high blood pressure;
- feeling very tired or having a general feeling of illness.

Other health problems, such as an infection, a cyst, bladder stones or kidney stones, can cause some of the same symptoms. Kidney cancer is often discovered during imaging for other reasons. Testing is needed to make a diagnosis.

DIAGNOSIS

After taking the patient's medical history and completing a physical examination, including an examination of the stomach area (abdomen and pelvis) and sides, the physician may suspect a kidney cancer. This hypothesis will necessarily bring along a series of tests among which a urine sample and a blood sample to check how well the kidneys are working and confirm the diagnosis. Several tests might also be done, such as blood tests, imaging studies and biopsies (see **diagnosis tools item** in the **Third Section** for more information on these tests).

BLOOD TEST

The blood sample may also be checked to measure the amounts of certain substances, such as creatinine, released into the blood by organs and tissues in the body. A high level of creatinine may mean the kidneys are not doing their job.

URINE TESTS

A urine sample is taken and checked for blood and other signs of disease or some markers of kidney function (e.g. Albuminuria).

IMAGING STUDIES

If kidney cancer is suspected, ultrasounds, MRI, CT scans will help confirm the diagnosis. A special radiograph called *intravenous pyelogram* might be performed eventhough it is not used as often as it once was. This test uses a contrast substance (radiopaque iodine) and x-rays to produce images of the urinary tract – kidneys, bladder, ureters and urethra. By following the radiopaque iodine progression on a radiology screen, the physician will eventually spot any abnormalities in the kidneys, urethra and bladder.

BIOPSY

Kidney cancer is not usually diagnosed using a biopsy because imaging tests usually confirm the diagnosis by the appearance of the tumour. A biopsy may be used to identify the type of cancer when a kidney tumour cannot be removed by surgery or if it is suspected that the tumour has spread to the kidney from another part of the body.

For a *kidney biopsy*, the physician may use ultrasound or CT to guide a thin needle through the skin into the kidney to remove a small amount of tissue from the abnormal area. The tissue is then checked under a microscope. If the cells are cancerous, they may be studied further to see how fast they are growing.

TREATMENT

SURGERY

Surgery is the most common treatment for kidney cancer. An operation to remove a kidney is called a *nephrectomy*. The remaining kidney is usually able to take over the job for both kidneys.

There are three types of kidney cancer surgery. The type will depend on the stage of the cancer and whether or not it has spread. *Radical nephrectomy*: the surgeon removes the entire kidney, along with the adrenal gland and some tissue around the kidney. Some of the nearby lymph nodes may also be removed. Kidney cancer is usually treated with radical nephrectomy. *Simple nephrectomy*: the surgeon removes only the kidney. A simple nephrectomy may be used for some people with early stage (stage 1) kidney cancer. *Partial nephrectomy*: the surgeon removes only the tumour and some of the tissue around the tumour. This type of surgery spares some of the kidney and may be used when the cancer affects both kidneys or if the patient has only one kidney because of a previous surgery.

After surgery the patient may have some pain or nausea, or may not feel like eating. These side effects are temporary, and can be controlled. To help with recovery after surgery, a narrow tube (called a catheter) may be put into the bladder through the urethra to drain the urine into a collecting bag so the patient will not have to use the bathroom. The catheter is usually removed after a couple of days.

ARTERIAL EMBOLIZATION

Arterial embolization helps shrink the tumour by blocking the flow of blood into the kidney. This stops the tumour from getting oxygen and other nutrients it needs to grow. The physician inserts a narrow tube into a blood vessel through a small cut in the leg. The tube is passed up to the main blood vessel (renal artery) that supplies blood to the kidney. Small pieces of a special gelatin sponge are injected through the catheter into the blood vessel to block the blood flow to the kidney. Arterial embolization is sometimes done before a nephrectomy to make surgery easier. After arterial embolization, the patient may have back pain or develop a fever. Other side effects include nausea and vomiting. These side effects go away soon after treatment.

BIOLOGICAL THERAPY

Biological therapy (sometimes called *immunotherapy*) uses natural body substances or drugs made from natural body substances to boost the body's own defences against illness. Interferon is a biological therapy used to treat kidney cancer that has spread. It's given by injection. The side effects can be severe, causing flu-like symptoms such as chills, fever, muscle aches, loss of appetite, nausea, vomiting and diarrhea. Side effects will disappear once treatment is finished.

TARGETED THERAPIES

Targeted therapies use drugs or other substances that can find and attack specific types of cancer cells without damaging healthy cells. These drugs work by stopping the growth of cancer cells and the growth of blood vessels to the tumour. The targeted therapy drugs used to treat kidney cancer are taken in pill form or intravenously. Side effects are usually mild, but they depend on the type of drug. These drugs may not be available in all centres.

SOME STATISTICS

AMONG ABORIGINAL PEOPLE OF QUEBEC

Between 1988 and 2004, 85 new cases of kidney cancer have been tallied among First Nations and Inuit of Quebec 39 women and 46 men. This type of cancer for both genders combined, represents 6.2% of all new cancer cases identified and 3.5% of the recorded cancer deaths. According to the standardized incidence and mortality rates for 100,000 people, the incidence rate for kidney cancer is twice as high among Aboriginals (24.5) than in the general population of Quebec (11.9), as is the mortality rate, notably more important (7.2 among Aboriginals and 4.4 for all of Quebec).

IN CANADA AND QUEBEC

In 2010, in Canada, an estimated 4,750 people (1,850 women and 2,900 men) will be diagnosed with kidney cancer and 1,660 will die from that cancer (610 women and 1,050 men). In Quebec, 1,350 people (830 men and 520 women) will be diagnosed with kidney cancer and 450 people (270 men and 180 women) will die from the disease. It is estimated that in 2009*, in Canada, 1 out of 64 men will be diagnosed with kidney cancer in his lifetime and 1 out of 138 will die from it. As for women, 1 out of 97 will be diagnosed with kidney cancer during her lifetime and 1 out of 234 will die from it.

* Since some of this information does not change significantly, the *Canadian Cancer Statistics* will publish this data every odd year

CERVICAL CANCER

BRIEF DESCRIPTION

Cervical cancer starts in the cells of the cervix. The cervix is the narrow, lower part of the uterus (or womb). It is the passageway that connects the uterus to the vagina. The cervix is part of a woman's reproductive system. It makes mucus that helps sperm move from the vagina into the uterus or keeps sperm from entering the uterus. Every month during the menstrual period blood flows from the uterus through the cervix into the vagina.

Before cervical cancer develops, the cells of the cervix start to change and become abnormal. Precancerous changes to the cervix are called *dysplasia of the cervix* (or *cervical dysplasia*). Dysplasia of the cervix is not cancer. It is a common precancerous change that can develop into cancer if it isn't treated. It is important to know that most women with dysplasia do not develop cancer.

Dysplasia of the cervix is usually picked up during the routine PAP TEST. In a Pap test, cells are scraped from the cervix and examined under a microscope. It helps detect both dysplasia and cervical cancer. Dysplasia of the cervix is also known as high grade and low grade squamous intraepithelial lesion (SIL) or cervical intraepithelial neoplasia (CIN). The most advanced form of CIN (CIN 3) is actually the very earliest form of cancer. Dysplasia is quite common. It can be easily treated and should not be alarming. Treatments for dysplasia may include laser surgery, electrosurgery (also called Leep or LLETZ), cryosurgery or surgery.

RISK FACTORS

There is no single cause of cervical cancer, but some factors appear to increase the risk of developing it. The main risk factor for developing cervical cancer is infection of the cervix with human papillomavirus (HPV). HPV is a group of more than 100 types of viruses. Some types of HPV can be passed easily from person to person through sexual contact. HPV infections are common and usually go away without treatment because the immune system gets rid of the virus. However, certain types of sexually transmitted HPV can cause changes to cells in the cervix that may lead to cervical cancer.

Other factors appear to increase the risk of developing cervical cancer such as not having regular PAP TESTS. These risk factors are: becoming sexually active at a young age; having many sexual partners or a sexual partner who has had many partners; smoking; having a weakened immune system (for example, from taking drugs after an organ transplant or having a disease such as AIDS); using birth control pills for a long time; giving birth to many children; having taken diethylstilbestrol (DES) or being the daughter of a mother who took DES (a form of estrogen that was used between 1940 and 1971 to treat women with certain problems during pregnancy such as miscarriage). Some women develop cervical cancer without any of these risk factors.

SYMPTOMS

Cervical cancer in its early or precancerous stages often does not cause any symptoms at all. That is why it is important for women who have been sexually active to have a PAP TEST.

The most common symptoms are:

- abnormal bleeding from the vagina, meaning bleeding or spotting between regular menstrual periods, bleeding after sex, menstrual periods that last longer and are heavier than before, bleeding after menopause;
- more discharge from the vagina than normal;
- pain in the pelvis or lower back;
- pain during sexual intercourse.

Often, these symptoms are caused by other health problems or infections, not cancer. Testing is needed to make a diagnosis.

SCREENING

Once a woman becomes sexually active, she should definitely have a Pap test every 1 to 3 years Women who have had a hysterectomy should talk to their physician to see whether a Pap test is still necessary. In general, every woman is invited to have a PAP test done regularly.

The most important risk factor for developing cervical cancer is infection of the cervix with human papillomavirus (HPV). HPV is spread through genital skin-to-skin contact and the virus can appear years after the patient has been exposed to it. Using a condom during sex may decrease the chance that the patient will pick up HPV, but a condom can only provide partial protection, as it doesn't cover the entire genital area. HPV 16 and 18 are the most common high-risk types and are responsible for 70% of cervical cancers. They are also linked to cancers of the penis, anus, vulva, vagina, as well as the oral cavity and throat. The two low-risk types of HPV (6 and 11) are responsible for 90% of genital warts but are not linked with the types of previously described cancers.

A vaccine that protects against HPV 6, 11, 16 and 18 is available in Canada. A vaccine that only protects against HPV 16 and 18 is being reviewed for approval and may become available. The vaccines prevent infection in young women who have not already been exposed to the HPV types that the vaccines cover. The vaccines work best when given to young women before they become sexually active. HPV vaccines do not treat HPV infections the patient already has or cure cancers related to HPV.

The HPV vaccine approved for use to prevent HPV infection should be viewed as complementary, rather than a replacement, for cervical cancer screening. All women regardless of whether or not they've had the HPV vaccine need to continue being screened for cervical cancer. HPV vaccines prevent infection from HPV types associated with only 70% of cervical cancer. The other 30% of cervical cancers are from HPV types not covered by the vaccines.

DIAGNOSIS

After completing a physical exam, which includes an examination of the abdomen and pelvis and genitals, and after talking with his/her patient about her health, a physician might suspect a cervical cancer. If the Pap test results suggest precancerous cells or cancer of the cervix, the physician will arrange more tests to confirm the diagnosis. One or more of the following tests might be performed: blood tests, imaging studies and biopsy (for additional information on blood tests, imaging studies and biopsy, please refer to **diagnosis tools item** in the **Third Section**).

COLPOSCOPY
A colposcopy is carried out in much the same way as a Pap test. A speculum (a clear plastic or metal device) is first inserted into the vagina to hold the vaginal walls open. Then the phisician uses a special instrument called a colposcope to examine the inside surface of the cervix and vagina. A colposcope is like a magnifying lens with a light on the end. A liquid may be dabbed onto the cervix to make the abnormal areas show up more clearly. A sample of tissue from the cervix is often taken during a colposcopy; this is called a *biopsy*. The biopsy may be uncomfortable, but it takes only a few minutes. Afterwards, the patient may have mild cramping similar to menstrual pain and some light vaginal bleeding for a few days.

BIOPSY
A *colposcopic biopsy* is done during a colposcopy. Biopsy forceps are used to remove small amounts of tissue from suspicious-looking areas, mainly in the lower part of the cervix. A local anesthetic (freezing) may be used to numb the cervix. *Endocervical curettage* may also be done during a colposcopy at the same time as a colposcopic biopsy to find out if there are precancerous cell changes or cancer cells in the upper part of the cervix. A narrow instrument shaped like a spoon, called a curette, is inserted into the upper part of the cervix leading into the uterus. Some of the tissue lining the upper cervix is removed by gently scraping it with the curette. A local anesthetic may be used to numb the cervix. A *cone biopsy* removes a cone-shaped piece of tissue from the cervix. A cone biopsy is done if a deeper sample of tissue is needed. The cone-shaped piece of cervix may be removed using a thin wire loop heated by an electrical current (LEEP), a surgical scalpel (cold-knife excision) or a laser (laser excision). A colposcope is used to help the physician to view the area and guide the tools used to perform the biopsy. A cone biopsy requires a general or regional anesthesia. A cone biopsy may cause mild cramping, discomfort and some bleeding that may continue for 2 to 4 weeks after the procedure. Sometimes all of the cancer can be completely removed by a cone biopsy and no further treatment is necessary.

BLOOD TESTS
Among other things, the blood tests could reveal an anemia (low red blood cell count) from cervical bleeding.

IMAGING STUDIES
Please see **diagnosis tools item** in the **Third Section**. The information found there on imaging studies also applies to cervical cancer.

TREATMENT

Before starting a treatment, a patient should talk with her physician about fertility. Some treatments may affect the ability to have children. A patient's treatment choice may depend on whether she would like to become pregnant in the future.

SURGERY
A decision to have surgery depends on the tumour's location and other factors such as the patient's age, her desire to have children in the future, her overall health and any treatment she has already had.

In the very earliest stages of cervical cancer, the removal of tissue during a cone biopsy may be all the treatment required. In other situations it may be necessary to remove the entire uterus (an operation called a hysterectomy). Lymph nodes in the pelvis may also be removed during surgery. After a hysterectomy a patient may have some pain, nausea or bladder and bowel problems. If the patient undergoes surgery to remove a small tumour on the surface of the cervix, she may have cramping, bleeding or a watery vaginal discharge. These side effects are usually temporary. After a hysterectomy, the patient will no longer menstruate (have her period) and will no longer be able to become pregnant.

RADIATION THERAPY

Radiation side effects will be different depending on the part of the body that receives the radiation. The patient may notice changes to the skin (it may be red or tender) where the treatment was administered. There may be some dryness, itching or burning in the vagina. These side effects will usually disappear once treatment is finished. Radiation therapy may make the vagina narrower. There are ways to expand the vagina, which will help make follow-up exams easier. Radiation may also cause early menopause. Menopause signifies the end of menstruations and the ability to conceive. For more information on radiation therapy, please see **The different types of radiation therapy / Radiation Therapy item** in the **Third Section**.

CHEMOTHERAPY

For more information on chemotherapy, please see **The different types of chemotherapy / Chemotherapy item** in the **Third Section**. The information found there applies in full here.

SOME STATISTICS

AMONG ABORIGINAL PEOPLE OF QUEBEC

Between 1988 and 2004, 46 new cases of cervical cancer have been tallied among First Nations and Inuit women of Quebec. Among Aboriginal women, this cancer represents 6.7% of all new cancer cases and ranks as the 4th most common type of cancer. According to the standardized incidence and mortality rates for 100,000 people, the incidence rate of cervical cancer is almost three times higher among Aboriginals (21.3) than in the general population of Quebec (8.2). As for the mortality rate, it is four times higher (8.0 among Aboriginals and 2.0 for all of Quebec).

IN CANADA AND QUEBEC

In 2010, in Canada, an estimated 1,300 women will be diagnosed with cervical cancer and 370 women will die from it, including 280 women from Quebec being diagnosed and 65 will die from it. Furthermore, it is estimated that in 2009*, in Canada, 1 out of 148 women will be diagnosed with cervical cancer in her lifetime and 1 out of 423 will die from this disease.

* Since some of this information does not change significantly, the *Canadian Cancer Statistics* will publish this data every odd year.

NON-HODGKIN LYMPHOMA

BRIEF DESCRIPTION

Non-Hodgkin lymphoma is a cancer that starts in the lymphocytes, the cells of the lymphatic system. The lymphatic system works with other parts of the immune system to help the body fight infection and disease. The lymphatic system is made up of a network of lymph vessels (which are a little like veins), lymph nodes and the lymphatic organs (such as the spleen, thymus, tonsils and bone marrow).

Lymph is a clear, yellowish fluid that contains *lymphocytes*. Lymphocytes are special white blood cells that help fight infection. They develop in the bone marrow from immature cells (called *stem cells*). There are two kinds of lymphocytes: *B-cells* stay in the bone marrow or lymphatic organs until they mature; *T-cells* move to the thymus gland to mature. *Lymph nodes* are small bean-shaped glands, grouped in clusters in the neck, underarms, chest, abdomen and groin. Lymph nodes filter out waste, bacteria and unwanted cells, including cancer cells, as the lymph passes through them. *Lymphatic vessels* collect lymph from different tissues throughout the body, filter it through the lymph nodes and return it to the bloodstream.

Non-Hodgkin lymphoma develops when a lymphocyte, either a B-cell or T-cell, becomes abnormal. It usually starts in a group of lymph nodes in one part of the body, most often the neck. Eventually, it can spread to almost any tissue or organ in the body through the lymphatic system or the bloodstream. There are over 20 types of non-Hodgkin lymphoma. The cells of the different types look different under a microscope, and they develop and spread differently (for example, slowly or aggressively). The way the abnormal cells develop and spread depends on the type of lymphocyte the lymphoma it started in. Most types of non-Hodgkin lymphoma develop from B-cells. It is important for the phisician to find out which type of non-Hodgkin lymphoma the patient has in order to prescribe the treatment that works best for that type.

RISK FACTORS

There is no single cause of non-Hodgkin lymphoma, but some factors increase the risk of developing it: being older and male; having a weakened immune system (due to taking immunosuppressant drugs after an organ transplant, HIV/AIDS, autoimmune diseases, such as rheumatoid arthritis or Sjögren syndrome, inherited disorders such as ataxia-telangiectasia or Wiskott-Aldrich syndrome, infections such as human T-cell leukemia/lymphoma virus (HTLV-1), Epstein-Barr virus or *Helicobacter pylori* (a bacteria)). Other risk factors are: exposure to pesticides and previous treatment with radiation or chemotherapy. Most people develop non-Hodgkin lymphoma without any of these risk factors.

SYMPTOMS

The most common symptom of non-Hodgkin lymphoma is swelling of the lymph nodes in the neck, underarm or groin. Usually, especially in the early stages, this swelling does not cause any pain. The person may discover the enlarged (swollen) lymph node, or her physician may find it during a routine physical exam or x-ray of the chest.

Other symptoms include:

- unexplained weight loss;
- unexplained fevers;
- drenching night sweats;
- lack of energy, fatigue;
- itchy skin.

Often, these symptoms are not caused by non-Hodgkin lymphoma. Swollen lymph nodes are very common and can be caused by other health problems such as the flu or an infection. Testing is needed to make a diagnosis.

DIAGNOSIS

If, after a patient's medical history and completing a physical examination, the physician suspects a non-Hodgkin lymphoma, he/she will arrange for special tests, such as blood tests, imaging studies and biopsies to confirm the diagnosis (for additional information on these tests, please refer to **diagnosis tools item** in the **Third Section**).

BLOOD TESTS

The blood sample may also be checked to measure the amounts of certain substances released into the blood by organs and tissues in the body.

IMAGING STUDIES

Please see **diagnosis tools item** in the **Third Section**. The information found there on imaging studies also applies to non-Hodgkin Lymphoma.

LYMPH NODE BIOPSY

If the cells are cancerous, they will be studied further to find out the exact type of non-Hodgkin lymphoma the patient has. There are many ways to perform a biopsy. The type will depend on where the enlarged lymph nodes are. For a core *needle biopsy*, the physician inserts a needle through a small cut in the skin to remove a sample of tissue from the lymph node. A local anesthetic (freezing) will be used to numb the area. A *surgical biopsy* is an operation that is used if the enlarged lymph node cannot be easily reached with a needle. There are two types of surgical biopsies. An *incisional* biopsy takes a tissue sample from the lymph node. An *excisional* biopsy takes out the entire lymph node. This may be done with a local or general anesthesia.

FURTHER TESTING

If the initial tests show a non-Hodgkin lymphoma, the physician may order more tests to find out if the cancer has spread. These may include blood tests, imaging studies, more biopsies of lymph nodes or the liver, bone marrow or cerebrospinal fluid (the fluid around the spinal cord and brain).

BONE MARROW ASPIRATION AND BIOPSY

A bone marrow aspiration or biopsy may be performed to see if the lymphoma has spread to the bone marrow. Bone marrow is the soft, spongy material that fills the centre of most bones (those where blood cells are made). There are two ways to get a bone marrow sample. For a *bone marrow aspiration*, the physician uses a thin needle to remove samples of bone marrow. A *bone marrow biopsy* uses a thicker needle to remove a sample of bone marrow and a small piece of bone. Both types of biopsies use a local anesthetic to numb the area. Usually, bone marrow aspirations and biopsies are performed at the same time in a clinic or hospital on an outpatient basis.

LUMBAR PUNCTURE

A lumbar puncture (also called a *spinal tap*) may be done to see if the lymphoma has spread to the nervous system. A lumbar puncture is a biopsy that removes a small amount of cerebrospinal fluid to check for cancer cells. A needle is inserted between two vertebrae in the backbone and a small amount of the fluid that surrounds the spinal cord is removed. A local anesthetic is used and the lumbar puncture takes about 30 minutes.

TREATMENT

Some treatments may affect the patient's ability to have children. Loss of fertility may be temporary or permanent, depending on the age and whether the testicles or ovaries receive radiation.

WATCHFUL WAITING

If a patient has indolent non-Hodgkin lymphoma without any symptoms, he may not need active treatment right away. Instead, the physician may offer a program called *watchful waiting*. Watchful waiting means the healthcare team will monitor the cancer closely. The patient will visit the physician regularly, usually every 3 months, for a physical examination and, from time to time, other tests may be performed. Active treatment, such as chemotherapy or radiation, may be considered only if signs of cancer appear or change. Indolent non-Hodgkin lymphoma may not cause any problems for a very long time.

CHEMOTHERAPY

Chemotherapy for non-Hodgkin lymphoma may be given alone or with other therapies, such as biological therapy or radiation therapy. If the lymphoma has spread to the nervous system, the chemotherapeutic drugs may be injected directly into the cerebrospinal fluid (intrathecal chemotherapy). It is administred with a local anesthetic. In addition to the side effects caused by the chemotherapy, some drugs used for non-Hodgkin lymphoma may cause the skin to become darker. For more information on chemotherapy and its side effects, see **Chemotherapy item** in the **Third Section**.

BIOLOGICAL THERAPY

Biological therapy is a treatment that uses the immune system to fight cancer or to help control side effects of other cancer treatments. Natural body substances or drugs made from natural body substances are used to boost the body's own defenses against illness.

Monoclonal antibodies are a type of biological therapy used to treat some types of non-Hodgkin lymphoma, either alone or together with chemotherapy. Given by injection, these drugs may cause flu-like symptoms (such as chills, fever, muscle aches, weakness and nausea). In rare cases, some people may have more serious side effects such as severe skin rash, breathing problems or low blood pressure. The side effects usually disappear once treatment is finished.

RADIATION THERAPY

For more information on radiation therapy, please see **The different types of treatment / Radiation therapy item** in the **Third Section**. The information found there applies in full here.

STEM CELL TRANSPLANT

Sometimes high doses of chemotherapy, radiation therapy or both are used to treat non-Hodgkin lymphoma that has resurfaced. High-dose chemotherapy and radiation therapy destroy the bone marrow cells as well as the cancer cells, so the bone marrow will need to be replaced with a transplant of stem cells. All blood cells develop from the stem cells found in the bone marrow and in the bloodstream.

Before high-dose chemotherapy is given, stem cells will be taken from the patient or from a donor whose bone marrow is a close match. Soon after the chemotherapy treatment, the stem cells are put back into the patient's blood and, within a few weeks, the new stem cells will start to produce blood cells.

A stem cell transplant is a risky and complex procedure. For this reason, stem cell transplants are done in specialized transplant centres or hospitals by a team of highly trained healthcare professionals. It may take several months to fully recover after a stem cell transplant.

SOME STATISTICS

AMONG ABORIGINAL PEOPLE OF QUEBEC

Between 1988 and 2004, 46 new cases of non-Hodgkin lymphoma have been tallied among the First Nations and Inuit of Quebec, 20 in women and 26 in men. This type of cancer represents 3.3% of all new cancer cases reported and 1.7% of cancer deaths, both genders combined. According to the standardized incidence and mortality rates for 100 000 people, the incidence rate of non-Hodgkin lymphoma is lower among Aboriginals (12.4) than in the general population of Quebec (16.2), as is the mortality rate (3.4 among Aboriginals and 7.0 for all of Quebec).

IN CANADA AND QUEBEC

In 2010, in Canada, an estimated 7,500 people (4,100 men and 3,400 women) will be diagnosed with non-Hodgkin lymphoma and 3,200 people (1,750 men and 1,450 women) will die from it. , In Quebec, 1,740 people (930 men and 810 women) will be diagnosed and 750 (400 men and 350 women) will die from the disease. Furthermore, it is estimated that in 2009*, in Canada, 1 out of 46 men will be diagnosed with non-Hodgkin lymphoma in his lifetime and 1 out of 93 will die from it. One out of 52 women has a risk of developing this cancer in her lifetime and 1 out of 104 will die from the disease.

* Since some of this information does not change significantly, the *Canadian Cancer Statistics* will publish this data every odd year.

PANCREATIC CANCER

BRIEF DESCRIPTION

Pancreatic cancer starts in the cells of the pancreas. The pancreas is a large gland that lies behind the stomach deep in the upper part of the abdomen. The pancreas is part of the digestive system. Digestive juices produced by the pancreas flow down a tube in the centre of the pancreas called the pancreatic duct. The pancreatic duct joins the common bile duct, which carries bile from the liver. The common bile duct then empties into the duodenum (the first part of the small intestine). The pancreatic juices and bile help further digest food in the duodenum after food has left the stomach.

The pancreas is also part of the hormonal system and produces insulin and other hormones. Hormones produced in the pancreas enter the bloodstream and help the body use or store the energy (sugar and fat) from the food eaten. Most pancreatic cancers start in the ducts that carry pancreatic juices. Pancreatic cancer that starts in the cells that make hormones (called *islet cell cancer*) is rare. Pancreatic cancer is also identified by its location: cancer of the head of the pancreas (70%) or cancer of the tail of the pancreas.

RISK FACTORS

Most people diagnosed with pancreatic cancer are over the age of 65. There is no single cause of pancreatic cancer, but some factors increase the risk of developing it: smoking; obesity; having diabetes or chronic pancreatitis (long-term inflammation of the pancreas); having an inherited disorder, such as hereditary pancreatitis, hereditary non-polyposis colon cancer (HNPCC), Peutz-Jeghers syndrome, familial breast cancer (BRCA2), familial atypical multiple mole melanoma syndrome (FAMMM, also called *atypical mole syndrome*). Some people develop pancreatic cancer without any of these risk factors.

SYMPTOMS

Pancreatic cancer often does not cause any signs or symptoms in its early stages. Because the pancreas lies deep in the abdomen and doesn't have nerves that can send pain messages to the brain, a tumour in the pancreas can grow quite large without causing symptoms.

When the tumour is larger or starts to spread outside the pancreas, it may cause discomfort or a mild ache in the upper abdomen that feels like indigestion. Possible symptoms include:

- discomfort in the stomach area (upper abdomen) or upper back;
- pain in the upper abdomen or back that may feel worse at night or when lying flat;
- unexplained weight loss;
- a bloated feeling after eating;
- loss of appetite;
- nausea and vomiting;
- diarrhea;
- fatigue;
- development of diabetes;
- mood swings.

If the tumour is blocking the common bile duct, jaundice may develop, which will cause the skin and the whites of the eyes to turn yellow and the urine to be darker. Other health problems can cause some of the same symptoms. Testing is needed to make a diagnosis.

DIAGNOSIS

After taking the patient's medical history and completing a physical examination, the physician may suspect pancreatic cancer. To confirm the diagnosis, the physician will arrange special tests. Several tests may be performed such as blood tests, imaging studies and biopsies (for additional information on these tests, please refer to **diagnosis tools item** in the **Third Section**).

BLOOD TESTS

The blood may also be tested for tumour markers. Tumour markers are substances (usually proteins) that can show up in the blood in some types of cancers. CEA and CA19-9 are two markers that can show up in pancreatic cancer. Tumour marker tests are mainly used to check a person's response to cancer treatment, but they can also be used to diagnose pancreatic cancer.

IMAGING STUDIES

Abdominal ultrasound, Computed tomography (CT) and Magnetic resonance imaging (MRI) are all ways for the health care team to obtain an image of the tumour and check whether the disease has spread. Please see **diagnosis tools item** in the **Third Section**. The information found there on imaging studies also applies to pancreatic cancer.

ENDOSCOPY

An endoscopy lets the physician look inside certain parts of the body using an endoscope. An endoscope is a thin, flexible tube with a light and a tiny camera at the end. To diagnose pancreatic cancer, the patient may have one of the following endoscopic procedures: an endoscopic retrograde cholangiopancreatography (ERCP) or a laparoscopy.

For an *endoscopic retrograde cholangiopancreatography* (ERCP), the endoscope is placed down the throat and passed through the stomach and duodenum into the opening of the pancreatic duct. The physician can then take x-rays of the pancreas and common bile duct. Dye is injected through the endoscope into the bile and pancreatic ducts; the dye helps show any abnormalities or blockages of the ducts on the x-ray. If the tumour is blocking the bile ducts or small intestine, a small metal tube (called a stent) may be put in place, using the endoscope, to open the blockage. The patient will be given a mild anesthetic (freezing) for this test.

For a *laparoscopy*, the endoscope is inserted through a small cut in the abdomen. A laparoscopy lets the physician look at the pancreas and other organs in the abdomen. A laparoscopy is performed under general anesthesia in surgery by a surgeon. A laparoscopy and a laparotomy may be necessary to clarify and confirm the diagnosis.

BIOPSY

A biopsy may be necessary to make a definite diagnosis of cancer. For pancreatic cancer, cells may be taken during ERCP or laparoscopy. Another way to perform a biopsy is with a *fine needle aspiration*. For a fine needle aspiration, a thin needle is inserted through the skin of the abdomen. The physician may use ultrasound or CT images to guide the needle to the lump or abnormal area.

FURTHER TESTING

If the initial diagnosis tests show pancreatic cancer, the physician may order more tests to find out if the cancer has spread and if the cancer can be removed by surgery.

TREATMENT

SURGERY

Surgery for pancreatic cancer is a major operation, with significant side effects and requiring several weeks to recover. It is important for a patient to discuss with his/her physician the benefits and possible risks associated with surgery. Sometimes of the cancer can be completely removed with surgery.

For early-stage pancreatic cancer, there are three types of surgery. *Whipple procedure (pancreaticoduodenectomy)*: this type of surgery is performed when the tumour is found in the widest part of the pancreas (the head). The surgeon removes the head of the pancreas, part of the stomach and small intestine, the common bile duct, the gallbladder and nearby lymph nodes. *Distal pancreatectomy*: this type of surgery is performed when the tumour is found in other parts of the pancreas. The surgeon removes the part of the pancreas where the tumour is found and the spleen. This surgery is rare. *Total pancreatectomy*: this type of surgery is done when the cancer has affected the entire pancreas. The surgeon removes the entire pancreas, part of the stomach and small intestine, the common bile duct, the gallbladder, the spleen and nearby lymph nodes. This surgery is rare.

After all or part of the pancreas is removed, a patient will likely need to take pills or injections to replace the enzymes and insulin that were produced by the pancreas. The patient will take these replacements for the rest of his/her life. More commonly, pancreatic cancer is found at a later stage and cannot be completely removed. In these cases, surgery is used to relieve the symptoms caused by the cancer but not to cure it.

If the tumour cannot be removed and is blocking the bile duct and the stomach, a hollow tube (stent) may be put in the bile duct to keep it open. The stent can be inserted during ERCP. If a stent can't be put in place, the surgeon may make a new connection between the stomach, the small intestine as well as the hepatic ducts to bypass the blockage. This is called bypass surgery. During surgery, a feeding tube may be placed into the patient's small intestine to receive liquids and nutrients until he/she is able to eat and drink on his/her own. It will be several days before the patient is able to drink and gradually start a soft diet.

CHEMOTHERAPY

Chemotherapy may be used to treat pancreatic cancer after surgery. It can be used to relieve pain or control symptoms if the tumour cannot be removed. For more information on chemotherapy and its side effects, see **Chemotherapy item** in the **Third Section**.

RADIATION THERAPY

Radiation therapy, alone or together with chemotherapy, may be used to treat pancreatic cancer after surgery. It can be used to relieve pain or control symptoms if the tumour cannot be removed. For more information on radiation therapy and its side effects, see **Radiation Therapy item** in the **Third Section**.

SOME STATISTICS

AMONG ABORIGINAL PEOPLE OF QUEBEC

Between 1988 and 2004, 30 new cases of pancreatic cancer have been tallied among the First Nations and Inuit of Quebec, 19 in men and 11 in women. This type of cancer represents 2.2% of all new cancer cases reported and 3.2% of cancer deaths, both genders combined. According to the standardized incidence and mortality rates for 100,000 people, the incidence rate for pancreatic cancer is lower among Aboriginals (9.3) than in the general population of Quebec (10.7), as is the mortality rate (7.2 among Aboriginal and 10.0 for all of Quebec).

IN CANADA AND QUEBEC

In 2010, in Canada, an estimated 4,050 people (1,950 men and 2,100 women) will be diagnosed with pancreatic cancer and 3,850 people (1,850 men and 2,000 women) will die from it. In Quebec, 1,210 people (570 men and 640 women) will be diagnosed and 1,010 people (470 men and 540 women) will die from the disease. Furthermore, it is estimated that in 2009*, in Canada, 1 out of 78 men will be diagnosed with pancreatic cancer in his lifetime and 1 out of 74 will die from it. One out of 72 women is at risk of developing this cancer in her lifetime and 1 out of 68 will die from the disease.

* Since some of this information does not change significantly, the *Canadian Cancer Statistics* will publish this data every odd year.

BLADDER CANCER

BRIEF DESCRIPTION

Bladder cancer starts in the cells of the bladder. The bladder is found in the lower part of the abdomen it is a hollow, balloon-shaped organ with a flexible, muscular wall. The bladder collects and stores urine, which is produced by the kidneys. Urine is then passed to the bladder through two tubes called ureters. When the bladder is full, the muscles in the bladder wall tighten to force the urine from the body through a tube called the urethra.

Nearly all bladder cancers start in the lining of the bladder. Cancer that is only in the lining is called superficial bladder cancer. If the cancer spreads into the muscle wall of the bladder, it is called invasive bladder cancer.

RISK FACTORS

There is no single cause of bladder cancer, but some factors appear to increase the risk of developing it. Smoking is the most common risk factor for bladder cancer in Canada. The tars and chemicals in the smoke pass quickly from the lungs into the bloodstream and then into the urine, which collects in the bladder.

Other factors that appear to increase the risk of developing bladder cancer are: age – particularly over 65; exposure to certain industrial chemicals (especially dyes and arsenic); treatment with certain medications such as cyclophosphamide (used to treat cancer and some other conditions); being white (Caucasians are at increased risk and Asians have the lowest risk); family history of bladder cancer; personal history of bladder cancer (a person who has had bladder cancer before has an increased chance of getting the disease again); pelvic irritation. Some people develop bladder cancer without any of these risk factors.

SYMPTOMS

The most common symptom of bladder cancer is blood in the urine (hematuria) (present in 80% of all bladder cancers). Other signs and symptoms of bladder cancer may include:

- bladder spasms;
- frequent urination;
- pain or burning during urination (dysuria);
- pain in the lower back;
- inability to urinate;
- urgent need to urinate;
- reduced bladder capacity.

Often, these symptoms are not caused by cancer. Other health problems, such as infections or bladder stones, may cause bleeding and other symptoms. Testing is needed to make a diagnosis.

DIAGNOSIS

After taking the patient's medical history and completing a physical examination, particularly of the abdomen and pelvis, the physician may suspect bladder cancer. The physical exam may include an examination of the rectum for men, and the rectum and vagina for women. To confirm the diagnosis, the physician arranges special tests. Several tests may be used, among which blood tests, imaging studies and biopsies (for additional information on these tests, please refer to **diagnosis tools item** in the **Third Section**).

URINE TESTS

Urine samples are checked for traces of blood, urine cytology (or analysis of specific cells found in urine to help diagnose cancer) and other signs of disease.

BLOOD TESTS
The results show how well the kidneys and other organs are working. The red blood cell count may also be checked to see if the patient has anemia (low red blood cell count). Anemia may be caused by blood loss from a bladder tumour.

IMAGING STUDIES
The patient may have a special x-ray called an *intravenous pyelogram (IVP)* (for carcinoma of the ureter) supplemented by a cystography (bladder cancer). A special dye is injected into a vein (usually in the arm); the dye passes through the bloodstream into the kidneys and through the urinary system. The physician can watch the passage of the dye on an x-ray screen and look for problems in the kidneys, ureters and bladder.

CYSTOSCOPY
Cystoscopy uses a thin tube with a light at the end (called a cystoscope) to look inside the bladder. The cystoscope is passed into the urethra to allow the physician to examine the lining of the bladder and urethra. In some cases, the tube has a camera attached to it and photographs can be taken. During a cystoscopy, the patient will probably be given a mild anesthetic. If a biopsy is performed at the same time, it requires a general anesthesia. Cystoscopy is the cornerstone of bladder cancer diagnosis.

BIOPSY
A biopsy is usually necessary to make a definite diagnosis of cancer. There are many ways to perfrom a biopsy. A biopsy is usually taken during a cystoscopy.

TREATMENT

SURGERY
Surgery is one of the main treatments for bladder cancer. There are three types of bladder cancer surgery; the stage of the cancer dictates the type of surgery.

Transurethral resection (TUR) with fulguration is often used to treat superficial cancer that hasn't invaded the muscle wall. It can be perfromed under regional or general anesthesia. A tool with a small wire loop on the end is inserted into the bladder through a cystoscope. The loop is used to remove the tumour. The area is then burned with an electric current (fulguration) or special high-energy laser, this helps to stop the bleeding and to burn away any remaining cancer cells. After a TUR, urinating can be painful or difficult. The patient may also notice some blood in the urine. These problems will go away after a few days. The physician will likely advise the patient to have regular cystoscopies to make sure there is no new tumour.

Segmental cystectomy may be used to treat invasive cancer that is low grade and has invaded only one area of the bladder wall. After a segmental cystectomy, the bladder will be smaller and may not be able to hold as much urine as before. The patient may need to urinate more often. This problem is usually temporary, but for some people it can be permanent.

Radical cystectomy is the most common type of surgery for invasive cancer. During a radical cystectomy the entire bladder is removed. Some surrounding tissue, nearby lymph nodes and organs are also removed to get rid of all the possible cancer cells. In men, the nearby organs include the prostate, seminal vesicles and part of the urethra. In women, the uterus, cervix, Fallopian tubes, ovaries, front of the vaginal wall and urethra are also removed. After a radical cystectomy, a new way to store and pass urine is required. The phy-

sician will discuss the choices with the patient before the surgery, so he/she can help make this important decision. The surgeon may construct an artificial bladder or redirect the flow of urine through an opening in the abdominal wall called a stoma. The urine will be collected in a bag outside the body. The stoma operation is called a urostomy.

A radical cystectomy will also affect the ability to have children and will affect the sex life. For women who have had part of the vagina removed, sex may be difficult. If the uterus and ovaries have been removed, the patient will go into menopause right away (if she hasn't gone through menopause already). Menopause means the end of menstruations and no longer being able to procreate. The symptoms of menopause caused by surgery are likely to be more severe than a natural menopause. These may include hot flashes, night sweats, vaginal dryness and loss of desire for sex. For men, a radical cystectomy can sometimes damage the nerves that control the ability to have or keep an erection (*impotence*). Improved surgical methods may help avoid this problem. Men who have had their prostate and seminal vesicles removed no longer produce semen, so they have dry orgasms and will no longer be able to father a child.

CHEMOTHERAPY

Some drugs used to treat bladder cancer (as with those used to treat other types of cancer) can damage the kidneys. Drinking plenty of fluids helps protect the kidneys. For superficial bladder cancer, intravesical chemotherapy is commonly used. For this type of chemotherapy, the drugs are put directly into the bladder through a catheter (tube) passed through the urethra. An anesthetic jelly is usually applied to the catheter to numb the urethra. The drugs must be kept in the bladder for about 2 hours to break down the cancer cells on the bladder wall. For more information on chemotherapy and its side effects, see **Chemotherapy item** in the **Third Section**.

BIOLOGICAL THERAPY

Biological therapy is most often used for superficial bladder cancer after TUR. This helps prevent the cancer from returning. The most commonly used drug is Bacillus Calmette-Guérin (BCG). A bacillus is a type of bacteria. BCG contains live, weak bacteria that stimulate the immune system to kill cancer cells in the bladder. Usually the BCG solution is injected directly into the bladder through a catheter passed through the urethra and must be kept in the bladder for about 2 hours. An anesthetic jelly is usually applied to the catheter to numb the urethra. BCG may irritate the bladder. The patient may feel an urgent need to urinate or need to urinate frequently and it may also be painful to urinate. Some people may have nausea, a low-grade fever or chills, while others may have blood in their urine. These side effects usually go away when the treatment is over.

RADIATION THERAPY

Radiation for bladder cancer may irritate the rectum and cause abdominal cramping or changes to the bowel movements. The patient may also need to urinate more often. These side effects are a result of damage to normal cells; they will usually go away when treatment is over and the normal cells repair themselves.

Radiation therapy can affect sexuality. For women, it may cause vaginal dryness or make the vagina narrower, which can make sex difficult or uncomfortable. For men, damage to the nerves and blood vessels in the penis may cause erectile problems. The healthcare team can suggest ways to treat or control these side effects. For more information on radiation therapy and its side effects, see **Radiation Therapy item** in the **Third Section**.

SOME STATISTICS

AMONG ABORIGINAL PEOPLE OF QUEBEC

Between 1988 and 2004, 28 new cases of bladder cancer have been tallied among the First Nations and Inuit of Quebec, 24 in men and 4 in women. This type of cancer represents 2.0% of all new cancer cases reported and 0.9% of cancer deaths, both genders combined. According to the standardized incidence and mortality rates for 100 000 people, the incidence rate for bladder cancer is lower among Aboriginals (9.5) than in the general population of Quebec (20.6), as is the mortality rate (2.1 among Aboriginals and 4.5 for all of Quebec).

IN CANADA AND QUEBEC

In 2010, in Canada, an estimated 7,100 people (5,300 men and 1,800 women) will be diagnosed with bladder cancer and 1,850 people (1,300 men and 550 women) will die from it. In Quebec, 2,370 people (1,750 men and 620 women) will be diagnosed and 440 (300 men and 140 women) will die from this type of cancer. Furthermore, it is estimated that in 2009*, in Canada, 1 out of 28 men will be diagnosed with bladder cancer in his lifetime and 1 out of 95 will die from it. One out of 83 women has a risk of developing this cancer in her lifetime and 1 out of 230 will die from it.

* Since some of this information does not change significantly, the *Canadian Cancer Statistics* will publish this data every odd year.

BRAIN CANCER

BRIEF DESCRIPTION

A brain tumour is a group of abnormal cells in the brain. Primary brain tumours start in the brain and can be either benign or malignant. In most parts of the body, a benign tumour is not as serious as a malignant tumour. In the brain, both benign and malignant tumours can be serious and possibly life-threatening.

Benign brain tumours do not contain cancer cells. They don't invade nearby tissues, but they can put pressure on certain parts of the brain, causing serious health problems. *Primary malignant brain tumours* contain cancer cells. They tend to grow quickly, increasing pressure in the brain. They can also spread to other parts of the brain or to the spinal cord. These tumours are very serious and are often life-threatening.

The brain is a soft, spongy mass of tissue. In a way, it is the control centre of the whole body. Three main parts of the brain control the different activities the human body performs. The *cerebrum* allows a person to see, feel, think, speak and move. The cerebrum receives messages from the senses and knows what is going on and how to respond. The cerebrum is the largest part of the brain. It is made up of two halves, called *hemispheres*. The right side of the brain controls the left side of the body and the left side of the brain controls the right side of the body. Each hemisphere is divided into sections, or lobes. The *cerebellum* is found under the cerebrum at the back of the brain. The cerebellum controls balance and coordination. The *brain stem* is at the bottom of the brain and connects the brain to the spinal cord. It controls the basic body functions necessary for living, including blood pressure, heartbeat, breathing and reflexes.

The brain is wrapped in three thin membranes called *meninges*. A watery fluid called *cerebrospinal fluid* (CSF) fills the spaces between the meninges and cushions the brain. The brain is protected by the skull.

The brain is made up of two types of cells: nerve cells (*neurons*) and glial cells. The nerve cells form a network that carries messages back and forth between the brain and the rest of the body. Glial cells surround the nerve cells and hold them in place. There are many different types of brain tumours, but most adult brain tumours start in the glial cells; these types of tumours are called *gliomas*.

RISK FACTORS

Brain tumours can occur at any age, but are most common in adults between ages 50 and 70. Men are more likely than women to develop most types of brain tumours.

Factors that increase the risk of developing a brain tumour include: previous radiation therapy to the head (such as treatment in adulthood for benign tumours of the pituitary gland or treatment during childhood for leukemia or scalp ringworm); having a weakened immune system (for example, from taking drugs after an organ transplant or having a condition such as HIV/AIDS); workplace exposure to vinyl chloride (a chemical used to make plastics); certain genetic conditions, such as neurofibromatosis type 1 or type 2, tuberous sclerosis or the following syndromes - Turcot, Li-Fraumeni, Wiskott-Aldrich and von Hippel-Lindau (the role of pesticides and electromagnetic waves is still under study without evidence to support it). Some people develop brain tumours without any of these risk factors.

SYMPTOMS

The signs and symptoms of brain tumours vary depending on where the tumour is in the brain. They may also be caused by pressure on the brain. The skull is hard and can't expand, so as a tumour grows the pressure within the skull can damage or destroy brain cells. The most common symptom of a brain tumour is a headache, often progressive, constant and usually worse at night or in the morning. Other symptoms may include:

- muscle jerking or twitching (seizures or convulsions);
- nausea, vomiting;
- loss of appetite;
- changes in mood, judgment, personality or ability to concentrate;
- problems with memory;
- changes in speech, hearing or vision;
- dizziness or problems with balancing or walking;
- sleeping for longer periods at night and napping frequently;
- confusion, disorientation, weakness or paralysis on one side of the body.

Other health problems can cause some of the same symptoms. Testing is needed to make a diagnosis.

DIAGNOSIS

A number of special tests are usually required to confirm a diagnosis of brain cancer. In addition to a more accurate diagnosis, the Computed tomography (CT) and/or Magnetic resonance imaging (MRI) allow for an assessment to help plan the treatment. If cancer is actually detected, these tests may also be used to "grade" the cancer cells. The low-grade cells, whose proliferation is slow, are less invasive than high-grade cells, which multiply rapidly and may spread to other parts of the body. Several tests may be used such as blood tests, imaging studies, biopsies, lumbar puncture and EEG (for additional information on these tests, please refer to **diagnosis tools item** of the **Third Section**).

LUMBAR PUNCTURE OR SPINAL TAP

For this test, a needle is inserted between two vertebrae in the backbone and a small amount of the fluid that surrounds the spinal cord is removed. This sample is then examined under a microscope for cancer cells. A local anesthetic is used for this test.

ELECTROENCEPHALOGRAPHY (EEG)

This test consists of recording the brain's spontaneous electrical activity using electrodes placed on the scalp. This test is pain free and does not require any anesthetic.

BIOPSY

In some cases, a biopsy of the brain will require surgery and a general anesthesia. In other cases, the biopsy is performed using a thin needle inserted through the tumour. The surgeon may use ultrasound, CT scan or MRI pictures on a computer screen to guide the needle (stereotactic biopsy). A local anesthetic is used for this test.

TREATMENT

SURGERY
A decision to have surgery depends on the size of the tumour, its location and its proximity to important brain function areas. Surgery is done under general anesthesia and the patient will stay in the hospital for several days after the surgery.

Surgery is the most common treatment for a brain tumour. Surgery to open the skull is called a craniotomy. Before surgery begins, the scalp is shaved. The surgeon makes a small incision in the scalp and removes a piece of the skull. All or part of the tumour is removed and then the bone and skin of the scalp are put back in place to heal. It may take weeks to recover fully from a brain operation. The patient may have a headache when waking up following the surgery. Painkillers can be used to help control pain. The eyes and face may be swollen and bruised. These side effects are temporary, and should disappear within a few days. A tube may be inserted into the scalp to drain excess blood from the wound but is usually removed a day or two after the operation.

Both tumours and surgery can damage normal brain tissue. Unlike other types of cells, nerve cells cannot replace themselves. Damaged nerve cells may cause different neurological problems (such as changes in movement, memory or speech). Physical therapy, cognitive therapy or speech therapy may help to overcome some of the neurological problems that existed before treatment or new ones that developed after surgery.

RADIATION THERAPY
Radiation therapy may be given after surgery to treat tumours that could not be completely removed. It may also be used when surgery is not possible or for tumours that have reappeared after surgery or chemotherapy.

In external beam radiation therapy, a large machine is used to carefully aim a beam of radiation at the tumour. A special mask will be made for each patient and helps make sure the patient does not move during treatment and is positioned the exact same way for each treatment. Special blocks are used to protect the patient's eyes and the other parts of the brain. For more information on radiation therapy and its side effects, see **Radiation Therapy item** in the **Third Section**.

STEROID THERAPY
Steroids are often used to reduce swelling around brain tumours. Steroids do not treat the tumour, but can reduce symptoms and bring some relief. They may be used before or after surgery, or during or after radiation therapy. Taking steroids for several weeks may lead to temporary swelling of the face and abdomen, weight gain and other side effects. Suddenly stopping steroids may cause serious problems. The physician will discuss with his patient how the doses can be reduced over time. Side effects will gradually disappear as the steroid dose is lowered.

CHEMOTHERAPY
Chemotherapy may be given as pills or by injection, after surgery or with radiation therapy. For more information on chemotherapy and its side effects, see **Chemotherapy item** in the **Third Section**.

ANTICONVULSANTS
Some brain tumours can cause seizures. Anticonvulsants (anti-seizure medications) are given to prevent further seizures in people with brain tumours who have had a seizure.

SOME STATISTICS

AMONG ABORIGINAL PEOPLE OF QUEBEC

Between 1988 and 2004, 26 new cases of brain cancer have been tallied among the First Nations and Inuit of Quebec, 17 in men and 9 in women. This type of cancer represents 1.9% of all new cancer cases reported and 2.3% of cancer deaths, both genders combined. According to the standardized incidence and mortality rates for 100,000 people, the incidence rate for brain cancer is lower among Aboriginals (4.7) than in the general population of Quebec (7.0), as is the mortality rate (3.3 among Aboriginals and 5.2 for all of Quebec).

IN CANADA AND QUEBEC

In 2010, in Canada, an estimated 2,650 people (1,500 men and 1,150 women) will be diagnosed with brain cancer and 1,750 people (1,000 men and 750 women) will die from it. In Quebec, 730 people (400 men and 330 women) will be diagnosed and 510 (300 men and 210 women) will die from this type of cancer. Furthermore, it is estimated that in 2009*, in Canada, 1 out of 132 men will be diagnosed with brain cancer in his lifetime and 1 out of 171 will die from it. One out of 172 women has a risk of developing this cancer in her lifetime and 1 out of 220 will die from it.

* Since some of this information does not change significantly, the *Canadian Cancer Statistics* will publish this data every odd year.

STOMACH CANCER

BRIEF DESCRIPTION

The stomach is a muscular sac-like organ in the upper abdomen. It is part of the digestive system. Organs of the digestive system change food into energy and help eliminate waste from the body.

Food moves from the mouth through the esophagus to the stomach. In the stomach, the food is mixed with digestive juices (enzymes and acids), which are made by the glands in the lining of the stomach. The semi-solid mixture leaves the stomach through a muscular ring called the pylorus and passes into the small intestine. From there, food goes to the large intestine, where digestion is finished.

The wall of the stomach has four layers. Stomach cancer begins in the cells of the inner layer, which is called the mucosa. It can spread through the other layers of the stomach as it grows. Stomach cancers that start in the lymphatic tissue (lymphoma), in the stomach's muscular tissue (sarcoma) or in the tissues that support the organs of the digestive system (gastrointestinal stromal tumour) are less common and are treated in different ways.

RISK FACTORS

Men are more likely to be diagnosed with stomach cancer than women. There is no single cause of stomach cancer but some factors increase the risk of developing it. The main risk factors are: diet high in salt, salted meats and smoked meats; diet low in vegetables and fruit; inflammation or other problems in the stomach such as chronic gastritis (long-term inflammation of the stomach lining), intestinal metaplasia (changes to the cells in the lining of the stomach), pernicious anemia (a blood disease that affects the stomach), previous stomach surgery, lower production of stomach acids than normal; infection caused by *Helicobacter pylori (H. pylori)* bacteria, which are commonly found in the stomach; growing older, particularly after 50; smoking; family history of stomach cancer; workplace exposure to rubber processing and lead manufacturing. Some people develop stomach cancer without any of these risk factors.

SYMPTOMS

Stomach cancer often does not cause any signs or symptoms in its early stages. The most common symptom is a mild ache in the abdomen that feels like indigestion. Possible symptoms of stomach cancer include:

- loss of appetite;
- heartburn;
- indigestion that does not go away;
- nausea and vomiting;
- a bloated feeling after eating;
- change in bowel habits;
- unexplained weight loss;
- feeling very tired.

Often, these symptoms are not caused by cancer. Other health problems can cause them. Testing is needed to make a diagnosis.

DIAGNOSIS

After taking his patient's medical history and completing a physical examination, the physician may suspect stomach cancer. To confirm the diagnosis, the physician will arrange special tests. Several tests may be used such as blood tests, imaging studies and biopsies, (for additional information on these tests, please refer to **diagnosis tools item** in the **Third Section**).

BLOOD TESTS

In addition to the blood being used to check for cancer, the red blood cell count is verified to see if the patient has anemia (low red blood cell count) caused by blood loss from a stomach tumour. An iron deficiency anemia requires an upper and lower endoscopy.

IMAGING STUDIES
GASTROSCOPY
Gastroscopy uses a thin, flexible tube with a light at the end (called a *gastroscope*). The tube is placed down the patient's throat to look inside the esophagus and the stomach. During a gastroscopy, the patient will probably be given a mild anesthetic (freezing) and the patient may be given a mild sedative to help him/her relax.

The patient could also have an ultrasound and CT Scan. Sometimes, a series of x-rays of the esophagus and stomach called an *upper gastrointestinal (GI) series* might be prescribed. The patient will be asked to drink a thick, chalky liquid called *barium*, which coats the inside of the esophagus, stomach and small intestine and makes them show up more clearly on the x-rays. If there are signs of cancer, the physician will also look to see if it has spread.

BIOPSY
If an abnormal area is found, the physician can take several samples of tissue through the gastroscope. The patient may need a general anesthesia if tissue samples are taken.

FURTHER TESTING
If tests show stomach cancer, the physician may order more blood tests, imaging studies, trans-endoscopic ultrasound or possibly a *laparoscopy* to find out if the cancer has spread.

Trans-endoscopic ultrasound, using an ultrasound device placed at the end of an endoscope or gastroscope: endoscopic examination performed under local anesthesia with sedation to determine the size of the tumour, the lymph nodes, the extent of the disease and to take a biopsy if indicated.

For a laparoscopy, a thin, flexible tube with a light and camera at the end is inserted through a small cut in the abdomen. The physician looks around the abdomen and may take several small biopsy samples and may remove some lymph nodes. This invasive procedure is performed under general anethesia.

TREATMENT

SURGERY
Surgery is the most common treatment for stomach cancer. An operation to remove all or part of the stomach is called a gastrectomy. The type of gastrectomy performed depends on the stage of the cancer and whether or not it has spread. A *partial gastrectomy* may be all that's needed if the cancer is found at a very early stage. The surgeon removes only the cancerous part of the stomach, as well as nearby lymph nodes. The surgeon may also remove the lower part of the esophagus or the upper part of the small intestine, depending on where the cancer is found. Reconstructive surgery is done at the same time to attach the remaining part of the stomach to the esophagus or the small intestine. For a total gastrectomy, the surgeon removes the entire stomach, nearby lymph nodes, part of the esophagus, part of the small intestine and other tissues near the tumour. The spleen may also be removed. Reconstructive surgery is performed at the same time to attach the esophagus to the small intestine.

Palliative surgery does not cure the cancer but can relieve symptoms. If the tumour cannot be removed and is blocking the esophagus, a hollow tube (called a stent) may be put in the esophagus to keep it open. This will make eating and swallowing easier. If a tumour that can't be removed is blocking the passage of food from the stomach to the intestine, the surgeon may make a new connection between the stomach and the small intestine to allow food to bypass the blockage. This is called bypass surgery.

During surgery, a feeding tube may be placed into the small intestine to give liquids and nutrients to the patient until he/she is able to eat and drink on his/her own. It takes a few days before the patient is able to drink and gradually start eating soft foods. Eating properly after stomach surgery can be hard. Instead of three big meals, it might be easier to take several light meals or snacks. A registered dietician or nutritionist could give a personalized food plan.

CHEMOTHERAPY
Chemotherapy may be given as pills or by injection. Chemotherapy, together with radiation therapy, may be used to treat stomach cancer after surgery. It can be used to relieve pain or control the symptoms if the tumour cannot be removed. For more information on chemotherapy and its side effects, see **Chemotherapy item** in the **Third Section**.

RADIATION THERAPY
Radiation therapy, together with chemotherapy, may be used to treat stomach cancer after surgery. It can be used to relieve pain or control the symptoms if the tumour cannot be removed. For more information on radiation therapy and its side effects, see **Radiation Therapy item** in the **Third Section**.

SOME STATISTICS

AMONG ABORIGINAL PEOPLE OF QUEBEC
Between 1988 and 2004, 25 new cases of stomach cancer have been tallied among the First Nations and Inuit of Quebec, 15 in men and 10 in women. This type of cancer represents 1.8% of all new cancer cases reported and 2.5% of cancer deaths, both genders combined. According to the standardized incidence and mortality rates for 100,000 people, the incidence rate for stomach cancer is lower among Aboriginals (7.8) than in the general population of Quebec (10.4), as is the mortality rate (5.4 among Aboriginals and 7.7 for all of Quebec).

IN CANADA AND QUEBEC
In 2010, in Canada, an estimated 2,950 people (1,900 men and 1,050 women) will be diagnosed with stomach cancer and 1,820 people (1,100 men and 720 women) will die from it. In Quebec, 800 people (500 men and 300 women) will be diagnosed and 540 (330 men and 210 women) will die from this type of cancer. Furthermore, it is estimated that in 2009*, in Canada, 1 out of 72 men will be diagnosed with stomach cancer in his lifetime and 1 out of 106 will die from it. One out of 123 women has a risk of developing this cancer in her lifetime and 1 out of 166 will die from it.

* Since some of this information does not change significantly, the *Canadian Cancer Statistics* will publish this data every odd year.

LIVER CANCER

BRIEF DESCRIPTION

Primary liver cancer starts in the cells, bile ducts, blood vessels or connective tissue of the liver. It is not very common. Primary liver cancer is different from cancer that started somewhere else in the body and spread to the liver (called *secondary* liver cancer or *metastatic* liver cancer). The liver is one of the largest organs in the body. It is found in the upper part of the abdomen on the right-hand side and is protected by the lower ribs. The liver has two parts called lobes – the right lobe and the smaller left lobe.

The liver has many important functions: producing enzymes and bile that help digest food; storing energy, vitamins and minerals, and releasing them into the blood when they are needed; making proteins that help the blood clot to stop bleeding from a cut or injury; cleaning the blood by removing harmful materials, such as alcohol and waste products; regulating the level of some of the natural chemicals in the body, such as cholesterol. The liver gets its supply of blood from two places. The *hepatic artery* supplies the liver with blood that is rich in oxygen from the lungs and heart. The *portal vein* carries blood that is rich in nutrients from the intestines to the liver.

Most primary liver cancers begin in liver cells (called *hepatocytes*). This type of cancer is called *hepatocellular carcinoma*. Cholangiocarcinomas are less common and start in the cells of the bile ducts, which are tubes that carry bile from the liver to the gallbladder. The gallbladder stores bile until it is needed for digestion. The information found here is about hepatocellular cancers. For additional information on other types of liver cancer, contact the Cancer Information Service at the Canadian Cancer Society at **1 888 939-3333**.

RISK FACTORS

There is no single cause of primary liver cancer but some factors increase the risk of developing it: having chronic liver infection (hepatitis B or hepatitis C); cirrhosis (scarring of the liver caused by hepatitis, heavy alcohol drinking over a long period of time and some genetic conditions); exposure to aflatoxin – a natural chemical produced by mould that grows on some poorly stored nuts and grains (commonly found in Africa and Asia); exposure to some industrial chemicals (such as vinyl chloride and arsenic); long-term use of anabolic steroids (hormones used by some athletes to increase their strength); some metabolic disorders, such as hemochromatosis (when the liver stores too much iron). Some people develop primary liver cancer without any of these risk factors.

SYMPTOMS

Primary liver cancer may not cause any signs or symptoms in its early stages. Symptoms usually appear once the tumour has spread to surrounding tissues and organs. Even advanced liver cancer sometimes does not cause symptoms. Other health problems can cause some of the same symptoms. It is important to report any unusual symptom to the physician.

Signs and symptoms of liver cancer include:

- lump in the right abdomen, just below rib cage;
- pain in the right upper abdomen or shoulder;
- pain around the right shoulder blade;
- loss of appetite;
- nausea;
- weight loss;
- fatigue;
- weakness;
- bloating;
- swelling of the legs;
- dark urine;
- jaundice, itching;
- fever.

DIAGNOSIS

After taking his patient's medical history and completing a physical examination, the physician may suspect liver cancer. The physician will feel the stomach area (abdomen and pelvis) to check the liver, spleen and nearby organs for any lumps or changes in their shape or size. The physician will also check for an abnormal buildup of fluid in the abdomen and examine the patient's skin and eyes for signs of jaundice.

To confirm the diagnosis, the physician will arrange special tests. Several tests may be used, among which blood tests, imaging studies and biopsies (for additional information on these tests, please refer to item **diagnosis tools** of the **Third Section**).

BLOOD TESTS

A liver function test will show how well the liver is working. Another test measures how long the blood takes to clot. The blood may also be tested for proteins called *tumour markers*. Liver cancer cells make a tumour marker called *alpha-fetoprotein* (AFP). High levels of AFP may be a sign of cancer.

IMAGING STUDIES

Among other tests, the patient might have an abdominal ultrasound, CT scan of the abdomen, MRI, or scans and, on occasion, a special x-ray called an *arteriogram* (also called an *angiogram*). A special dye is injected into an artery in the groin. The dye passes into the blood vessels in the liver, which helps the physician see them more clearly.

BIOPSY

For a *core needle biopsy*, the physician inserts a needle through a cut in the abdomen to remove a large sample of tissue. A *fine needle aspiration* uses a thin needle to remove a small amount of tissue from the abnormal area in the liver. For both types of liver biopsy, the physician may use ultrasound or CT images to help guide the needle to the right spot. A local anesthetic will be used to numb the area. After a liver biopsy the patient may need to stay in the hospital for a couple of hours or possibly overnight because there is a risk of bleeding afterwards.

LAPAROSCOPY
For a laparoscopy, a thin, flexible tube with a light and camera at the end is inserted through a small cut in the abdomen. The physician will look at the liver and other internal organs in the area and takes several small biopsy samples. A laparoscopy may be performed with only a local anesthetic, but it is usually done in the hospital under general anesthesia.

TREATMENT

For primary liver cancer, the choice of treatment will depend, among other things, on the condition of the liver, the number, size and location of the tumours, as well as whether or not the cancer has spread outside the liver.

SURGERY
For cancer that has not spread outside the liver, and when the tumour can be completely removed by surgery (*localized resectable*), surgery is the most effective treatment. The surgery is performed under a general anesthesia. There are several types of surgery. For a *partial hepatectomy*, the surgeon removes the tumour from inside the liver and some of the tissue around the tumour. This type of surgery may be used if the cancer has not spread outside the liver and the remaining liver tissue is healthy. If the operation removes a whole lobe of the liver, it is called a *lobectomy*. The liver has an amazing ability to repair itself. Even if up to three-quarters of the liver is removed, it will start to regrow quickly and may be back to normal size within a few weeks. Sometimes, a *total hepatectomy with a liver transplant* may be possible. For this operation, the transplant surgeon removes the entire liver and replaces it with a healthy liver or liver lobe from a suitable donor. A liver transplant can be done only if the disease within the liver is limited and has not spread outside the liver.

CRYOSURGERY
Cryosurgery destroys cancer cells by freezing them. Cryosurgery may be used to treat primary liver tumours that cannot be removed by surgery (are *unresectable*) and have not spread beyond the liver. Fever is a very common side effect of cryosurgery for up to 5 days after treatment.

RADIOFREQUENCY ABLATION
Radiofrequency ablation (RFA) uses a high-frequency electrical current to heat the cancer cells and destroy them. The physician inserts a special needle containing tiny electrodes directly through the skin of the abdomen. Ultrasound or CT images may be used to help the physician guide the needle to the right spot. A local anaesthetic is used to numb the area. RFA can also be carried out through an incision in the abdomen. This is done in the hospital under general anaesthesia. RFA may be used to treat small tumours that cannot be surgically removed.

PERCUTANEOUS INJECTION
For this type of treatment, a liquid such as ethanol is injected directly into the tumour to kill cancer cells. The physician inserts a needle guided by ultrasound or CT images through the skin into the tumour. A local anaesthetic is used to numb the area. A percutaneous injection may be used to treat small tumours that cannot be removed by surgery. If the tumour grows again, the treatment can be repeated.

CHEMOTHERAPY
For primary liver cancer, it may be possible to inject chemotherapeutic drugs directly into a tumour to kill the cancer cells. Chemotherapeutic drugs can also be injected directly into the hepatic artery that supplies blood to the liver. The drugs flow into the blood vessels that lead to the tumour and destroy the cancer cells. This is called *hepatic artery infusion*. Sometimes a combination of blocking agents

and chemotherapeutic drugs is injected into the liver artery. The physician first injects a chemotherapy drug into the artery to kill the cancer cells and then uses tiny particles to block the flow of blood through the artery. The blocking agents cut off the *tumour's blood supply. This is called chemoembolization*. Without blood flow, the chemotherapy drug stays in the liver longer. This requires a short hospital stay. There are fewer side effects with both chemoembolization and hepatic arterial infusion than with standard chemotherapy because only a small amount of the drug reaches other parts of the body. Any side effects that develop, such as fever, will go away soon after treatment. For more information on chemotherapy and its side effects, see **Chemotherapy item** in the **Third Section**.

RADIATION THERAPY

Radiation therapy is sometimes used to relieve pain and control the symptoms of advanced primary liver cancer. Radiation therapy to the abdomen may cause nausea, vomiting or diarrhea. For more information on radiation therapy and its side effects, see **Radiation Therapy item** in the **Third Section**.

SOME STATISTICS

AMONG ABORIGINAL PEOPLE OF QUEBEC

Between 1988 and 2004, 25 new cases of primary liver cancer have been tallied among the First Nations and Inuit of Quebec, 21 in men and 4 in women. This type of cancer represents 1.8% of all new cancer cases reported and 3.5% of cancer deaths, both genders combined. According to the standardized incidence and mortality rates for 100,000 people, the incidence rate for primary liver cancer is almost twice as high among Aboriginals (7.7) than in the general population of Quebec (4.1), while the mortality rate is exactly twice as high (7.8 among Aboriginals and 3.69 for all of Quebec).

IN CANADA AND QUEBEC

In 2010, in Canada, an estimated 1,840 people (1,400 men and 440 women) will be diagnosed with primary liver cancer and 750 people (590 men and 160 women) will die from it.

LEUKEMIA
CANCER

BRIEF DESCRIPTION

Leukemia is a cancer that starts in the stem cells of the bone marrow that make blood cells. Bone marrow is the soft, spongy material that fills the centre of most bones (where blood cells are made). Blood stem cells (immature blood cells) develop into either *myeloid stem cells* or *lymphoid stem cells*. Myeloid stem cells develop into one of three types of mature blood cells: *red blood cells* carry oxygen to all tissues of the body; *platelets* form clots in damaged blood vessels to prevent bleeding; white blood cells called *granulocytes* and *monocytes* destroy bacteria and help to fight infection. Lymphoid stem cells develop into *lymphocytes*. Lymphocytes are another type of white blood cell that are usually found in the lymph nodes and lymphatic system, such as the spleen and the blood. Lymphocytes produce antibodies to help fight infection.

Leukemia develops when the blood stem cells in the bone marrow make abnormal blood cells. These abnormal cells are called *leukemia* cells. Over time, the leukemia cells crowd out normal blood cells. This makes it hard for the white blood cells, red blood cells and platelets to do their jobs. There are several different types of leukemia. The types of leukemia are first divided according to the type of stem cell they developed from. *Myelogenous leukemias* develop from abnormal myeloid cells. *Lymphocytic leukemias* (also known as lymphoblastic leukemias) develop from abnormal lymphoid cells. The types of leukemia are further grouped according to how quickly the leukemia develops and grows. *Acute leukemias* start suddenly, developing within days or weeks. The number of leukemia cells in the blood can rise very fast and the blood cannot do its job. Acute leukemias deteriorate quickly and need to be treated right away. *Chronic leukemias* develop slowly over months or years, and may not cause any symptoms early in the disease. Symptoms start to appear as the number of leukemia cells in the blood or bone marrow increases.

There are four main types of leukemia: acute lymphoblastic leukemia (ALL), acute myelogenous leukemia (AML), chronic lymphocytic leukemia (CLL) and chronic myelogenous leukemia (CML). Because each type of leukemia develops and grows differently, each type is treated differently. It is important for the physician to find out which type of leukemia a patient has to prescribe the treatment that works best for that type.

RISK FACTORS

There is no single cause of leukemia, but some factors increase the risk of developing it. These risk factors are: being older; previous treatment with radiation or chemotherapy for cancer or other conditions; exposure to high levels of radiation, for example from a nuclear fallout; exposure to chemicals such as benzene; smoking; having a genetic disorder (such as Down syndrome) or abnormality (people with CML often have an abnormal chromosome called the Philadelphia chromosome); family history – having an inherited faulty gene or a family history of CLL; having a blood disorder, such as myelodysplastic syndrome (also called MDS) having had a viral infection such as human T-cell leukemia/lymphoma virus (HTLV-1). Some people develop leukemia without any of these risk factors.

SYMPTOMS

Symptoms start to appear as the number of leukemia cells grows and the bone marrow can no longer make the normal blood cells the body needs. Having too few normal white blood cells, red blood cells or platelets can cause a number of symptoms. In acute leukemia, symptoms appear and get worse quickly.

Acute leukemia (AML and ALL) can cause the patient to have too few normal white blood cells (a condition called neutropenia). This will make it very difficult for someone to fight infection. Someone with too few red blood cells (anemia) may feel very tired, be short of breath or look pale. Too few platelets (thrombocytopenia) can lead to unusual bleeding. In such case, a person may bruise easily or notice small purple or red spots on the skin, especially on the arms and legs. Other general symptoms of acute leukemia may include:

- fever;
- unexplained weight loss;
- general discomfort;
- sore throat;
- swollen gums and bleeding;
- drenching night sweats;
- headache;
- vomiting;
- vision problems;
- bone or joint pain;
- painless swelling of the lymph nodes.

In the early stages of chronic leukemia (CML and CLL), the leukemia cells can function almost normally and cause no symptoms. The disease is often discovered during a routine blood test. When symptoms do appear, they generally are mild at first and get worse gradually. General symptoms of chronic leukemia may include:

- fatigue;
- general discomfort;
- loss of appetite;
- unexplained weight loss;
- drenching night sweats;
- painless swelling of the lymph nodes.

Often, these symptoms are not caused by leukemia. Other health problems can cause them, such as the flu or an infection. Testing is needed to make a diagnosis.

DIAGNOSIS

After taking the patient's medical history and completing a physical examination, the physician may suspect leukemia. These tests may also be used to classify the leukemia. Many tests may be used such as blood tests, imaging studies and biopsies (for additional information on these tests, please refer to **diagnosis tools item** of the **Third Section**).

BLOOD TESTS

Blood is taken and studied to see if the different types of blood cells are normal in number and appearance. The results can also show how well the kidneys, liver and other organs are working. These tests may suggest whether or not the patient has leukemia.

IMAGING STUDIES

Using x-rays, ultrasounds, CT scans or MRIs, the healthcare team can get a picture of where the cancer is and see if it involves the organs, such as the spleen, liver or lymph nodes.

BIOPSY

To diagnose leukemia, cells are removed from the bone marrow, usually from the back of the hip bone. The cells are examined under a microscope. If leukemia cells are found in the bone marrow, they are studied further to see how fast they are growing. There are two ways to get a bone marrow sample. For a *bone marrow aspiration*, the physician uses a thin needle to remove samples of bone marrow. A *bone marrow biopsy* uses a thicker needle to remove a sample of bone marrow and a small piece of bone. Both types of biopsies use a local anesthetic to numb the area. Usually, bone marrow aspirations and biopsies performed in a clinic or hospital on an outpatient basis.

If the lymph nodes are enlarged lymph nodes, a *lymph node biopsy* may be done. Clusters of lymph nodes are found throughout the body they are part of the lymph or immune system. A lymph node biopsy may remove part or all of a lymph node. If the enlarged lymph node can be easily reached with a needle, a local anesthetic is used. However, a general anesthesia may be necessary if the enlarged lymph node is deep in the chest or abdomen.

LUMBAR PUNCTURE

A lumbar puncture (also called a *spinal tap*) may be done to see if the leukemia has spread to the nervous system. A needle is inserted between two vertebrae in the backbone and a small amount of cerebrospinal fluid is removed and checked for leukemia cells. Cerebrospinal fluid is the fluid that surrounds the spinal cord and the brain. A local anesthetic is used. A lumbar puncture takes about 30 minutes.

CYTOGENETICS

Cytogenetic tests (also called *chromosome analyses*) are performed on the bone marrow sample to look for changes in the chromosomes in the cells. Chromosomes are the part of a cell that contains genetic information. In the different types of leukemia, there are often distinct genetic abnormalities that cause changes in the structure of the chromosomes in leukemia cells. These tests help to identify the type of leukemia and therefore which treatment may work best.

TREATMENT

CHEMOTHERAPY

In general, the treatment is based on an intravenous or oral chemotherapy determined by the type and subtype of leukemia. Acute leukemias get worse quickly and need to be treated right away, usually requiring a high dose chemotherapy. When leukemia is present in the central nervous system, drugs are given directly into the spinal column (intrathecal). This is done under local anesthetic. For more information on chemotherapy and its side effects, see **Chemotherapy item** in the **Third Section**.

STEM CELL TRANSPLANT

Sometimes high doses of chemotherapy are used to treat leukemia that has resurfaced or if there is a high risk that it may return. High-dose chemotherapy destroys the bone marrow cells as well as the leukemia cells, so the bone marrow will need to be replaced with a transplant of stem cells. All blood cells develop from stem cells found in the bone marrow and in the bloodstream.

Before high-dose chemotherapy is given, stem cells will be taken from the patient or from a donor whose bone marrow is compatible. Soon after the chemotherapy treatment, the stem cells are put back into the blood and, within a few weeks, the

new stem cells will start to make blood cells. A stem cell transplant is a very and complex procedure. For this reason, stem cell transplants are performed in specialized transplant centres or hospitals by a team of highly trained healthcare professionals. Side effects can be very serious and may even be life-threatening. Even after leaving the hospital, the patient will be monitored very closely after a stem cell transplant and carefully followed-up on for a period of time. It may take several months to fully recover after a stem cell transplant.

RADIATION THERAPY

Radiation may be used for some types of leukemia to treat the disease or prevent it from spreading. If a patient needs a stem cell transplant, he/she may also be given radiation to the whole body to destroy the bone marrow cells. This is called *total* body irradiation. For more information on radiation therapy and its side effects, see **Radiation Therapy item** in the **Third Section**.

BIOLOGICAL THERAPY

There are two forms of biological therapy used to treat leukemia: *monoclonal antibodies* and *interferon alfa*. Both are given by injection. Monoclonal antibodies are sometimes used to treat people with chronic myelogenous leukemia (CLL), acute lymphoblastic leukemia (ALL) and acute myelogenous leukemia (AML). Interferon alfa may also be used for chronic myelogenous leukemia (CML) (although people with CML are more likely to be treated with cancer growth inhibitors). Side effects of these drugs often cause flu-like symptoms, such as chills, fever, muscle aches, weakness and nausea. More serious side effects are rare. Some people may have a severe skin rash, breathing problems or low blood pressure. The side effects usually disappear once treatment is finished.

TARGETED THERAPY

Targeted therapies use drugs that attack specific types of cancer cells without damaging healthy cells. *Cancer growth inhibitors* are a type of targeted therapy. They interfere with a cancer cell's ability to grow and divide. Some cancer growth inhibitors can be used to treat people with chronic myelogenous leukemia (CML), acute lymphoblastic leukemia (ALL) and acute myelogenous leukemia (AML). These drugs are taken by pill or capsule. Side effects are most likely to occur during the first few months of treatment. Side effects may get better as treatment continues.

WATCHFUL WAITING

Watchful waiting is a treatment option that may be offered to people with CLL who have no symptom. Watchful waiting means the healthcare team will watch the leukemia closely. The patient will visit the physician regularly for a physical examination. Other tests may be done from time to time. Active treatment, such as chemotherapy or radiation, may be considered if signs of leukemia appear or change. Once the symptoms are controlled, the physician may decide to return to a watchful waiting program.

SURGERY

Surgery is rarely used to treat chronic leukemia, but some people with chronic leukemia will need to have their spleen removed. The spleen is located in the abdomen and is attached to the stomach, left kidney and colon. In chronic leukemia, the spleen may become enlarged that can cause discomfort and pain. It also destroys red blood cells and platelets, causing anemia and bleeding. If chemotherapy or radiation doesn't shrink the spleen, then it may be removed by surgery. Surgery to remove the spleen is called splenectomy. It is performed under general anesthesia. Without a spleen, the patient may be more at-risk of infections. It requires the injection of pre or postoperative vaccines against pneumococcus, meningococcus and haemophilus influenzae.

SOME STATISTICS

AMONG ABORIGINAL PEOPLE OF QUEBEC

Between 1988 and 2004, 24 new cases of leukemia have been tallied among the First Nations and Inuit of Quebec, 11 in men and 13 in women. This type of cancer represents 1.7% of all new cancer cases reported and 2.5% of cancer deaths, both genders combined. According to the standardized incidence and mortality rates for 100,000 people, the incidence rate for leukemia is much lower among Aboriginals (4.9) than in the general population of Quebec (11.6), while the difference in the mortality rates are lower (3.6 among Aboriginals and 6.5 for all of Quebec).

IN CANADA AND QUEBEC

In 2010, in Canada, an estimated 4,800 people (2,800 men and 2,000 women) will be diagnosed with leukemia and 2,450 people (1,450 men and 1,000 women) will die from it. In Quebec, 1,160 people (650 men and 510 women) will be diagnosed and 540 (310 men and 230 women) will die from this type of cancer. Furthermore, it is estimated that in 2009*, in Canada, 1 out of 58 men will be diagnosed with leukemia in his lifetime and 1 out of 93 will die from it. One out of 81 women has a risk of developing this cancer in her lifetime and 1 out of 135 will die from it.

* Since some of this information does not change significantly, the *Canadian Cancer Statistics* will publish this data every odd year.

OVARIAN CANCER

BRIEF DESCRIPTION

Ovarian cancer starts in the cells of the ovary or ovaries. The ovaries are two small, oval-shaped organs that lie deep in the pelvis on either side of the uterus (womb), close to the end of the Fallopian tubes. The ovaries are part of the female reproductive system.

There are three main types of ovarian cancer. For each type, the cancer starts in a different type of cell found in the ovaries. *Epithelial cell cancer* starts in the cells that cover the outer surface of the ovary. *Germ cell tumours* start in the egg cells within the ovary and generally occur in younger women. Germ cell cancer can even develop in children. *Stromal tumours* start in the connective tissue cells that hold the ovary together.

Epithelial cell cancer is the most common type of ovarian cancer. Ovarian germ cell tumours and stromal tumours develop differently and may require different treatment. The information found here is about epithelial cell cancer. For information on ovarian germ cell tumours and stromal tumours, please contact the *Cancer Information Service* at the Canadian Cancer Society at: **1-888-939-3333**.

RISK FACTORS

There is no single cause of epithelial ovarian cancer, but studies have suggested that some factors appear to increase the risk of developing it. These risk factors are: age, particularly after 50 years; personal history of cancer (a woman who has had breast, uterine or colorectal cancer has an increased risk of getting ovarian cancer); a family history of ovarian cancer or breast cancer (especially in a mother, sister or daughter, or if a woman has hereditary mutations on certain genes, such as the BRCA1 or BRCA2 genes); a family history of colon, uterine or pancreatic cancer; never having been pregnant; taking hormone replacement therapy (especially estrogen-only therapy) for a long period of time.

Other possible risk factors are being studied, such as the use of fertility drugs, obesity, particular types of diet and the use of talcum powder on the genital area and smoking (which seems to increase the risk for some types of ovarian tumours). Further research is also being done to understand if the combined effect of early menstruation and late menopause, which increases the number of menstrual cycles over a woman's lifetime, is a risk factor. Some women develop ovarian cancer without any of these risk factors. Most women with ovarian cancer do not have a family history of the disease. Also, many women who do have risk factors do not get ovarian cancer.

SYMPTOMS

Ovarian cancer in its early stages often does not cause any symptoms at all. Ovarian cancer, in its early stages, may cause:

- discomfort;
- abdominal pressure or pain;
- abdominal swelling;
- change in bowel habits;
- feeling full after a light meal;
- indigestion;
- gas;
- upset stomach;
- feeling that the bowel has not completely emptied;
- nausea;
- fatigue;
- pain in lower back or leg;
- more frequent or urgent urination;
- abnormal vaginal bleeding;
- menstrual disorders;
- pain during intercourse.

When symptoms do start, they are often vague and easily mistaken for more common illnesses. Often these symptoms can be caused by other less serious health problems that are not cancer. Testing is needed to make a diagnosis.

DIAGNOSIS

The physician will most likely suspect an ovarian cancer after talking with the patient about her health, her personal and family medical history, and completing a physical examination. This will include an examination of her abdomen and pelvis. To confirm the diagnosis, the physician will arrange special tests. One or more of the following tests may be used (for additional information on blood tests, imaging studies and biopsies, please refer to **diagnosis tools item** in the **Third Section**).

IMAGING STUDIES

To diagnose or stage ovarian cancer, a *transvaginal ultrasound* may be performed. A *transvaginal ultrasound* uses sound waves to create a picture of the vagina, uterus, Fallopian tubes and ovaries. A small probe is inserted into the vagina to look for dark or dense areas on the image that may be cancer. Abdominal and pelvic computed tomography (CT scans) allows for a more accurate diagnosis and staging and to determine the extent of the disease and direct the treatment. A Magnetic resonance imaging (MRI) may also be required.

BLOOD TESTS

For ovarian cancer, the blood may be tested for several *tumour markers*, including CA-125, which is a substance found on the surface of ovarian cancer cells and on some normal tissues. If the CA-125 level is high, there is a higher chance of ovarian cancer and some other conditions. Further tests must be done. CA-125 can also help determine if the cancer has spread.

BIOPSY

In the case of ovarian cancer, the physician may choose to examine and take samples of tissue or fluid from the abdomen. This may be done by laparoscopy or laparotomy. For a laparoscopy, a thin, flexible tube with a light and camera at the end is inserted through a small incision near the belly button. The physician looks around the abdomen and pelvis and takes several small biopsy samples. This is usually done under general anesthesia. A laparotomy is an operation used to both diagnose and treat ovarian cancer. During the

operation, the physician first finds out if there is a cancer. If cancer is found, then the physician removes as much of the cancer as possible. A laparotomy is performed through an incision in the abdomen under general anesthesia.

TREATMENT

SURGERY

Surgery is the most common treatment for ovarian cancer. A decision to have surgery depends on the tumour's location, stage and grade. During the operation, all or part of the tumour and some healthy tissue around the tumour are removed. Surgery is performed under general anesthesia. For ovarian cancer, one or both ovaries, the Fallopian tubes and the uterus are usually removed. This is called a total abdominal hysterectomy and salpingo-oophorectomy. Often the fatty tissue covering the inside the abdomen (the omentum), together with nearby lymph nodes, is also removed.

Some effects of surgery for ovarian cancer are permanent. If both ovaries are removed, the patient immediately enters menopause (unless the patient has already gone through menopause). Menopause means the patient no longer has her period and will no longer be able to become pregnant. An oophorectomy can cause more severe side effects than a natural menopause such as hot flashes, night sweats, vaginal dryness and loss of sex drive. For young women with early- stage ovarian cancer, it may be possible to remove only one ovary, one Fallopian tube and the omentum. This is called fertility-sparing surgery. With fertility-sparing surgery the patient may be able to remain fertile and become pregnant after treatment.

RADIATION THERAPY

For ovarian cancer, a radioactive fluid may be introduced into the abdomen through a plastic tube (intraperitoneal radiotherapy). This fluid stays radioactive for only a few days, so it does not have to be removed from the body. For more information on radiation therapy and its side effects, see **Radiation Therapy item** in the **Third Section**.

CHEMOTHERAPY

Chemotherapy may be given as pills or by injection. For ovarian cancer, the drugs may be given through a thin tube inserted into the abdomen (intraperitoneal chemotherapy). For more information on chemotherapy and its side effects, see **Chemotherapy item** in the **Third Section**.

SOME STATISTICS

AMONG ABORIGINAL PEOPLE OF QUEBEC

Between 1988 and 2004, with respect to ovarian cancer and cancer of the other appendages of the womb have been tallied 23 new cases among the First Nations and Inuit of Quebec. This type of cancer represents, among Aboriginal women, 3.4% of all new cancer cases reported and 3.8% of cancer deaths. According to the standardized incidence and mortality rates for 100,000 people, the incidence rate for ovarian cancer and cancer of the other appendages of the womb is lower among Aboriginals (12.6) than in the general population of Quebec (14.2), as is the mortality rate (6.8 among Aboriginals and 7.9 for all of Quebec).

IN CANADA AND QUEBEC

In 2010, in Canada, an estimated 2,600 women will be diagnosed with ovarian cancer and 1,750 women will die from it. In Quebec, 690 women will be diagnosed and 390 will die from this type of cancer. Furthermore, it is estimated that in 2009*, in Canada, 1 out of 71 women will be diagnosed with ovarian cancer in her lifetime and 1 out of 87 will die from it.

* Since some of this information does not change significantly, the *Canadian Cancer Statistics* will publish this data every odd year.

UTERINE CANCER

BRIEF DESCRIPTION

The uterus (or *womb*) is part of a woman's reproductive system. It is the hollow, pear-shaped organ where a baby (foetus) grows before being born. The lower part of the uterus is called the *cervix*. The cervix leads into the vagina. The uterus is mostly muscle. Uterine cancer starts in the cells lining the uterus. The lining inside the uterus is called the *endometrium*. The endometrium is made up of tissue with many glands. This lining re-grows each month and is usually shed during the monthly menstrual period. The periods stop temporarily during pregnancy. Normally the periods will continue until menopause. Cancer that starts in the lining inside the uterus is called *uterine cancer* (or *endometrial carcinoma*). Cancer that starts in the muscle layers of the uterus is called uterine sarcoma.

RISK FACTORS

Most women with uterine cancer are post-menopausal and between 45 and 70 years old. There is no single cause of uterine cancer, but some factors increase the risk of developing it. These risk factors are: taking estrogen replacement therapy after menopause; obesity (being very overweight); beginning menstruation at a young age; reaching menopause later than average; having had high-dose radiation to the pelvis – used to treat bleeding from the uterus caused by a non-cancerous condition; taking the drug tamoxifen – a hormonal treatment sometimes used to treat breast cancer; never having given birth. Some women develop uterine cancer without any of these risk factors. Also, many women who do have risk factors do not get uterine cancer.

SYMPTOMS

The most common signs and symptoms of uterine cancer may include:

- unusual vaginal bleeding (bleeding that starts after menopause, bleeding between periods in premenopausal women, frequent heavy bleeding at any stage (before or after menopause), bleeding with sex);
- unusual vaginal discharge (foul smelling or pus-like);
- pain during sex;
- pain in the pelvic area.

Other health problems can cause some of the same symptoms. Testing is needed to make a diagnosis.

DIAGNOSIS

After taking his patient's medical history and completing a physical examination, the physician may suspect uterine cancer. To confirm the diagnosis, the physician arranges special tests. One or many of the following tests can therefore be performed (for additional information on blood tests, imaging studies and biopsies, please refer to **diagnosis tools item** in the **Third Section**).

IMAGING STUDIES

To confirm a diagnosis of uterine cancer, the physician may use a transvaginal ultrasound. A small device is gently inserted into the vagina. The device makes sound waves that are used to take a picture of the inside of the uterus. This can be uncomfortable but should not be painful. Abdominal and pelvic CT scans are used to clarify the staging and the extent of the disease.

BLOOD TESTS
Blood is taken and studied to see if the different types of blood cells are normal in number and appearance. The red blood cell count may be checked to see if the patient has anemia (low red blood cell count) caused by long-term bleeding from the vagina.

HYSTEROSCOPY
A hysteroscopy is an examination that uses a thin, flexible tube (called a *hysteroscope*) with a light and a tiny camera at the end to look inside the uterus. If an abnormal area is found, the physician can take several samples of tissue through the hysteroscope for examination under a microscope (*biopsy*). During a hysteroscopy, the patient will probably be given a local anesthetic.

BIOPSY
There are many ways to perform a biopsy. For an *endometrial biopsy*, cells may be taken at the physician's office. Gentle suction is used to remove a tissue sample through the cervix from the lining of the uterus. This causes little discomfort. An endometrial biopsy can also be performed during a hysteroscopy. If needed, a *dilation and curettage* (D&C) might be done. During a D&C, the cervix is spread open gradually so the physician can scrape a tissue sample from the lining of the uterus. D&C is an outpatient procedure. The patient is given either a local anesthetic or a general anesthesia. There may be period-like pain for a day or so afterwards.

FURTHER TESTING
If the initial tests show uterine cancer, the physician may order more tests to find out if the cancer has spread and to help plan the treatment.

TREATMENT

Uterine cancer usually occurs in women after menopause. However, some young women may have concerns about how treatment will affect their fertility. Some treatment can indeed damage the ovaries and cause symptoms of menopause, which usually disappear after treatment is completed. However, depending on the age, type of drugs prescribed as well as the dose, menstruation could possibly not resume and the menopause could be final.

SURGERY
Surgery is the main treatment for uterine cancer. Surgery to remove the uterus and the cervix is called a *hysterectomy*. Sometimes the Fallopian tubes, ovaries or lymph nodes in the pelvis are removed at the same time. Because uterine cancer is often discovered before it has spread beyond the uterus, it may be cured by a hysterectomy.

RADIATION THERAPY
Radiation may be used to treat uterine cancer after surgery. It can be used to relieve pain or control symptoms if the tumour cannot be removed. Radiation therapy may make the vagina narrower. There are ways to expand the vagina, which will help make follow-up exams easier. For more information on radiation therapy and its side effects, see **Radiation Therapy item** in the **Third Section**.

HORMONAL THERAPY
Hormones are chemical substances that are produced by glands in the body or made in a laboratory. Hormonal therapy is a treatment that removes hormones from the body or blocks their action and stops cancer cells from growing. Some uterine cancers grow in the presence of estrogen and progesterone hormones. Tissue samples are tested to check for estrogen receptors and progesterone receptors on the uterine cancer cells. If the uterine tumour has progesterone receptors, it is progesterone receptor positive (PR+) and may be treated

with hormonal drug therapy. Hormonal drugs can be given as pills, by injection or both. They usually cause few side effects. Some women have bloating (fluid retention) and increased appetite, which may cause weight gain. These effects are usually temporary.

CHEMOTHERAPY

Chemotherapy may be used after treatment with hormonal therapy or it can be used to relieve pain and control the symptoms of advanced uterine cancer. For more information on chemotherapy and its side effects, see **Chemotherapy item** in the **Third Section**.

SOME STATISTICS

AMONG ABORIGINAL PEOPLE OF QUEBEC

Between 1988 and 2004, 20 new cases of uterine cancer have been tallied among the First Nations and Inuit of Quebec. This type of cancer represents, among Aboriginal women, 2.9% of all new cancer cases reported. According to the standardized incidence and mortality rates for 100,000 people, the incidence rate for uterine cancer is noticeably lower among Aboriginals (9.8) than in the general population of Quebec (17.4), as is the mortality rate, (0.3 among Aboriginals and 2.2 for all of Quebec).

IN CANADA AND QUEBEC

In 2010, in Canada, an estimated 4,500 women will be diagnosed with uterine cancer and 790 women will die from it. In Quebec, 1,050 women will be diagnosed and 180 women will die from this type of cancer. Furthermore, it is estimated that in 2009*, in Canada, 1 out of 42 woman is at-risk of developing this cancer in her lifetime and 1 out of 175 will die from it.

* Since some of this information does not change significantly, the *Canadian Cancer Statistics* will publish this data every odd year.

APPENDIX 1
CANADIAN PARTNERSHIP AGAINST CANCER

AN INDEPENDENT NON-PROFIT ORGANIZATION

The *Canadian Partnership Against Cancer* is an independent non-profit organization, established by the Government of Canada in November 2006 to implement the measures recommended in the **Canadian Strategy for Cancer Control**. This organization, which began its operations in April 2007, relies, as its name suggests, on active forces for the battle against cancer existing across Canada. In addition to the Federal Government, provinces, territories, First Nations and Inuit, the national organization also includes groups of patients and cancer survivors as well as their families, charitable anti-cancer organizations and oncology specialists as partners, those who helped develop the **Canadian Strategy for Cancer Control** in the early 2000s. Several of these partners are serving as representatives on their respective organizations' board of directors.

PRIORITIES

The *Canadian Partnership Against Cancer* is defined as the driving force behind a targeted approach to promote prevention, improve the quality of life of cancer patients, reduce the likelihood of dying from this disease and increase the effectiveness of the fight against cancer in Canada.

To reach its goals, the organization is giving itself the role of a catalyst in the Canadian community for the fight against cancer based on priorities for action. These priorities are: prevention; screening and early detection; quality and standards in patient care; guidelines in cancer care; health human resources; research; and surveillance which consists of the collection and analysis of data related to cancer.

ADVISORY GROUPS

To achieve its targeted approach, the *Canadian Partnership against Cancer* has created seven advisory groups representing many collaborative networks across Canada whose members are brought together by one of the priorities listed above. The advisory panels are composed of volunteer experts such as health professionals, administrators, epidemiologists, researchers, patients and cancer survivors as well as their families. Members of these advisory groups share their knowledge, expertise and experience to transform ideas into action. Many of the *Canadian Partnership against Cancer* key initiatives come from these participatory authorities, each group being chaired by a prominent personality of the Canadian oncology clinical practice.

Parallel to this basic work, the *Canadian Partnership against Cancer* is working to disseminate new knowledge while initiating their applications in the healthcare sector and health services, in close collaboration with Health of Canada, ministries in the provinces and territories as well as with provincial organizations and anti-cancer charitable organizations.

CANADIAN PARTNERSHIP PROJECT, *HOPE FOR TOMORROW*

This project illustrates perfectly the huge potential of a Canada-wide consultation in regard to the fight against cancer. Funded for the most part by the *Canadian Partnership against Cancer*, this study will explore the impact of genetic background, environment, lifestyle and behaviours on human cancer development. This research project will therefore allow for a better understanding of the interactions between genetic factors, lifestyle and environmental exposures as well as their subsequent impact on cancer risk. The *Canadian Partnership for Tomorrow* project is the largest study ever conducted in Canada on its population. It involves 300,000 Canadians from five major regions of the country and intends to carry out follow-up over several decades. This major project is undertaken, collaboratively, by five principal investigators and their hosts. These research organizations are: *British Columbia Cancer Agency* (BC Generations project); for the western provinces the Alberta Cancer Board (The Tomorrow Project); for Ontario, *Cancer Care Ontario* and the *Ontario Cancer Research* (Ontario Health Study); for Quebec the CARTaGENE project; and for Atlantic Canada, *Cancer Care Nova Scotia* and Dalhousie University (The Atlantic Path). The database resulting from this study will contain important information that will enable policymakers to better target prevention programs in the fight against cancer. The results of the study may also be used for other health problems such as diabetes, heart diseases and respiratory diseases. Finally, they can contribute to the emergence of other research worldwide.

ABORIGINAL COMMUNITIES

The *Canadian Partnership against Cancer* has formed a working group of national Aboriginal organizations, agencies and stakeholders in the fight against cancer, the First Nations and Inuit Health Branch and the Public Health Agency of Canada to evaluate the types of action that will have a significant impact in the fight against cancer among Aboriginal Canadians. Among other things, a national forum on the **Canadian Strategy for the fight against Cancer** for First Nations, Inuit and Métis was inaugurated in the spring of 2009. In collaboration with the Saint Elizabeth Health Care, a web-based course has been established to provide health care providers working with Aboriginal communities access to continuous learning modules on the cancer issue. Finally, various other projects of a national scale and in Quebec have been initiated in partnership with the Assembly of First Nations.

RESOURCES

Additional information on the activities of the *Canadian Partnership against Cancer* is available on the national organization website, at **www.partnershipagainstcancer.ca** or by calling toll free at: **1-877-360 -1665**. Furthermore, the *Canadian Partnership against Cancer* has created the portal Cancer view Canada to inform Canadians about various aspects of the disease as well as on services and related resources. Just visit the following address: **www.cancerview.ca**.

APPENDIX 2
COALITION PRIORITÉ CANCER AU QUÉBEC

The *Coalition Priorité Cancer au Québec* (free translation: Priority Cancer Coalition in Quebec) is an independent voluntary association of many agencies devoted to advocacy for people with cancer, their families and loved ones. It is composed of players involved in research, prevention, detection, investigation, treatment, treatment monitoring, support to people and palliative care. All members agree on the need for Quebec to do more to better prevent cancer, help people affected by cancer and ultimately cure cancer.

VARIOUS ACTIONS

Since its inception in 2001, the *Coalition Priorité Cancer au Québec* has never ceased to denounce the shortcomings of the Quebec health network in the field of oncology services, including the lack of coordination, undue delays in access to services, changes in professional practices, difficulties in stowing with the community, a lack of transparency in managing the fight against cancer and deficiencies in the evaluation of results. Can be attributed to this organization many dissertations, many events such as forums, conferences and États généraux and petitions, including one that, during the winter of 2010, was presented to the National Assembly by the deputy of Mercier, Dr. Amir Khadir. The petition demanded the creation of a Quebec Agency for the fight against cancer.

A QUEBEC AGENCY FOR THE FIGHT AGAINST CANCER

According to the *Coalition Priorité Cancer au Québec*, such a structure has been proven around the world. In most other Canadian provinces, Europe and in many industrialized countries, the concentration of the authority and the responsibilities in the fight against cancer under a *dedicated organization* provides a better potential in terms of coherence of action. In Canada, the governance model was favoured by Alberta, British Columbia and Ontario. There are also models akin to it in Saskatchewan and, more recently, in Newfoundland and Labrador, New Brunswick and Nova Scotia.

To support the establishment of a strong central coordination that can fight with maximum effectiveness against cancer, the *Coalition Priorité Cancer au Québec* provides a reminder as to the urgency of the situation, stating, according to latest estimates, that one in two people will be diagnosed with cancer during his/her lifetime. In 2010, in Quebec, more than 44,000 people will be diagnosed with cancer and nearly 22,000 people will lose their fight. According to the OCDE, compared with major industrialized countries, Quebec has the second worst death rate from cancer as, when compared to Canadian Provinces, it ranks in the lowest, being surpassed in this regard by Prince Edward Island and Newfoundland and Labrador.

Additional information on the **Coalition Priorité Cancer au Québec** is available on the organization website, at **www.coalitioncancer.com**.

APPENDIX 3
CANADIAN CANCER SOCIETY

The *Canadian Cancer Society* (CCS) is a national community-based charity organization actively involved throughout Canada in the fight against cancer. Thanks to the generosity of the donors and the work of the volunteers and staff, the *Canadian Cancer Society* is leading the way in cancer control to actively prevent, cure or manage the scourge of cancer. To do so, the Canadian Cancer Society focuses its work in 5 areas: funding cancer research, advocating in the public's interest, preventing cancer, providing information to anyone living with cancer, and supporting people with cancer and their loved ones. Involved in Quebec since 1947, the year its first office opened in Montreal, the CCS can now be found in fourteen regions of Quebec. **Besides French and English, the CCS is able, through interpreters, to use several aboriginal languages spoken in Canada and Quebec to communicate with its customers, including the Algonquin, Cree and Inuktitut languages**.

This cancer info-kit lists the *CCS* services related specifically to its *Improving quality of life of cancer patients component*.

More information can be obtained by calling a single number used for all services: **1-888-939-3333**

Moreover, you can visit the website of the organization, **www.cancer.ca** to know all the details on the services listed below or contact: **info@sic.cancer.ca**.

MATERIAL ASSISTANCE

In parellel with the existing health services, material assistance such as bandages and related accessories is offered, free of charge, to cancer patients living at home. For this type of material assistance, individuals must apply by filling out the Request Form for bandages and other material. The application must be endorsed by a health professional (e.g. physician, nurse or nutritionist). The order is delivered by mail. In addition, when contacting the regional office nearest them, patients can have access to a free loan service for various other accessories such as wigs, scarves, turbans and temporary breast prostheses. A copy of the form can be obtained by visiting the CCS website a **www.cancer.ca**, and clicking on the tab **Support / Services at the Material and financial assistance**.

FINANCIAL ASSISTANCE

Cancer patients with low income may receive financial assistance for transportation between their home and the treatment centre as well as to purchase elastic stockings, elastic sleeves, wigs and colostomy bags for temporary colostomy patients.

THE JACQUES-CANTIN LODGE

An accommodations service is available for self-sufficient people living in regions throughout Quebec needing to receive their cancer treatments at one of Montreal's hospitals. The Jacques-Cantin Lodge contains twenty-nine rooms fully equipped and offers, at competitive rates, lodging, food and transportation to treatment centres. In addition, the Canadian Cancer Society is pleased to accommodate for the weekend, at the Jacques-Cantin Lodge, people living with cancer. This allows their caregivers to benefit from a well-deserved rest.

CANCER J'ÉCOUTE

The telephone support service *Cancer J'écoute* is intended for people living with cancer as well as their relatives and provides advice and encouragement in difficult times. In addition, a matching making service can allow a person struggling with cancer to benefit from the experience of a volunteer, trained in active listening, who has lived through a similar cancer experience. If, during a match, the person calling is experiencing significant difficulties that require a specific expertise, a second match will be made with a professional on a temporary basis.

CANCER INFORMATION SERVICE

The *CCS* has established an information service about cancer for the benefit of not only cancer patients, their families and the general public, but also health professionals and community stakeholders. Information specialists take the time to answer any question relating to cancer, such as types of cancer, appropriate treatment and side effects, clinical trials, coping with cancer, emotional support services, prevention, help in the community and complementary and alternative therapies.

COMMUNITY SERVICES LOCATOR

From a postal code, a very complete database enables cancer patients to access a list of all agencies and all institutions offering local services in their immediate area. Patients can access this service by visiting the *CCS* website, at **www.cancer.ca** and clicking on the tab **Support / Services**, **Community Services Locator**.

PUBLICATIONS

The *Canadian Cancer Society* provides stakeholders and health professionals with numerous publications providing information on various aspects of cancer that can be used, inter alia, to raise awareness through prevention campaigns.

To request publications or for any other service of the *CCS*, simply call the same number: **1-888-939-3333**.

APPENDIX 4
FONDATION QUÉBÉCOISE DU CANCER

Founded in 1979, the *Fondation québécoise du cancer* (free translation: Quebec Cancer Foundation) (FQC) offers information, support and accommodations for people with cancer and their families. It is now present in Montreal, Quebec, Sherbrooke, Gatineau and Trois-Rivieres.

INFORMATION

Information is the first key to healing. Through its Info-cancer line, Documentation Centre and Internet Information Portal, the *FQC* helps support people with cancer and their families, as well as informing the general public and stakeholders. Among others, a specialist nurse can be reached through his Info-cancer line to provide, confidentially and without charge, a wealth of information on all aspects of cancer.

Monday to Friday, 9 am to 5 pm
1-800-363-0063

In addition, a virtual library is open to everyone by visiting the *FQC* website, at **www.fqc.qc.ca**. This specialized library contains a large collection of books on various topics about cancer that can be accessed via the Internet. A mailing loan service has also been introduced, which is particularly useful for people living in regions of Quebec.

SUPPORT

A matching making service by phone can link a person with cancer with a volunteer who has already experienced the same type of cancer. These two people can share their experiences and discuss the impact of the disease on their lives. For this service, the phone number is the Info-cancer number mentioned above: **1-800-363-0063**.

LODGING ACCOMODATION

The *FCQ* Inns, located in Montreal, Sherbrooke, Trois-Rivières and Gatineau, are welcoming people with cancer for the duration of their treatment. The *FQC* Inns network has 126 beds, arranged in double-occupancy rooms, each including a bathroom. Beautiful and peaceful, the rooms have been furnished to provide a resting place and also to break the isolation. The Inns, all located near the centres of radiation oncology, also offer lounges for creating links between residents. Guests staying for periods ranging from four to six weeks mostly originate from peripheral areas or locations far from major hospitals. Since 1989, more than 30 000 people have been accommodated in the *FQC* Inns.

Access to additional information on all the *Fédération Québécoise du Cancer* services can be found by visiting the website of the organization **www.fqc.qc.ca**.
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APPENDIX 5
STUDY BY THE INSTITUT NATIONAL DE SANTÉ PUBLIQUE DU QUÉBEC

Table taken from the study Cancer among Aboriginal people living on reserves and in Northern villages in Quebec, 1984 - 2004–Incidence and Mortality, Institut national de santé publique du Québec, March 2009.

Distribution of the number of new cases of cancer and deaths from cancer among Aboriginals in Quebec living on reserves and in Northern villages according to cancer site and gender, 1988-2004.

BOTH GENDERS

Cancer sites	New cases (%)	Deaths (%)
Lung	319 (23.2)	256 (39.4)
Colorectal	181 (13.1)	52 (8.0)
Breast (women)	119 (8.6)	26 (4.0)
Prostate	88 (6.4)	28 (4.3)
Kidney	85 (6.2)	23 (3.5)
Cervix	46 (3.3)	15 (2.3)
Non-Hodgkin's Lymphoma	46 (3.3)	11 (1.7)
Pancreas	30 (2.2)	21 (3.2)
Bladder	28 (2.0)	6 (0.9)
Brain	26 (1.9)	15 (2.3)
Stomach	25 (1.8)	16 (2.5)
Liver	25 (1.8)	23 (3.5)
Leukemia	24 (1.7)	16 (2.5)
Ovary	23 (1.7)	11 (1.7)
Body of Uterus	20 (1.5)	1 (0.2)
Other sites	292 (21.2)	129 (19.9)

MEN

Cancer sites	New cases (%)	Deaths (%)
Lung	188 (27.2)	154 (42.4)
Prostate	88 (12.7)	28 (7.7)
Colorectal	81 (11.7)	28 (7.7)
Kidney	46 (6.7)	12 (3.3)
Non-Hodgkin's Lymphoma	26 (3.8)	6 (1.7)
Bladder	24 (3.5)	6 (1.7)
Liver	21 (3.0)	16 (4.4)
Pancreas	19 (2.7)	16 (4.4)
Brain	17 (2.5)	9 (2.5)
Stomach	15 (2.2)	12 (3.3)
Leukemia	11 (1.6)	9 (2.5)
Other sites	155 (22.4)	67 (18.5)

WOMEN

Cancer sites	New cases (%)	Deaths (%)
Lung	131 (19.1)	102 (35.7)
Breast	119 (17.3)	26 (9.1)
Colorectal	100 (14.6)	24 (8.4)
Cervix	46 (6.7)	15 (5.2)
Kidney	39 (5.7)	11 (3.8)
Ovary	23 (3.4)	11 (3.8)
Body of Uterus	20 (2.9)	1 (0.3)
Non-Hodgkin's Lymphoma	20 (2.9)	5 (1.7)
Leukemia	13 (1.9)	7 (2.4)
Pancreas	11 (1.6)	5 (1.7)
Stomach	10 (1.5)	4 (1.4)
Brain	9 (1.3)	6 (2.1)
Liver	4 (0.6)	7 (2.4)
Bladder	4 (0.6)	–
Other sites	137 (20.0)	62 (21.7)

Standardized rates of cancer incidence and mortality per 100,000 persons among Aboriginals in Quebec living on reserves and in Northern villages and in the Quebec general population according to cancer site and gender, 1988-2004

	Aboriginal in Quebec living on reserves and in Northern villages		Quebec general population	
OVERALL - Cancer site				
	Incidence	**Mortality**	**Incidence**	**Mortality**
Stomach	7.8 (4.6-11.0)	5.4 (2.7-8.1)	10.4 (10.3-10.6)	7.7 (7.5-7.8)
Colorectal	56.5 (47.9-65.0)	16.8 (12.1-21.6) -	54.3 (53.9-54.7)	24.6 (24.3-24.9)
Liver	7.7 (4.5-10.8)+	7.8 (4.5-11.1)+	4.1 (4.0-4.2)	3.9 (3.8-4.0)
Pancreas	9.3 (5.8-12.7)	7.2 (4.1-10.4)	10.7 (10.5-10.8)	10.0 (9.8-10.1)
Lung	106.0 (94.1-117.9)+	86.8 (75.9-97.7)+	71.9 (71.4-72.3)	59.8 (59.4-60.2)
Breast cancer among women	-	-	-	-
Cervix	-	-	-	-
Body of uterus	-	-	-	-
Ovary	-	-	-	-
Prostate	-	-	-	-
Bladder	9.5 (5.9-13.1)-	2.1 (0.4-3.9)-	20.6 (20.4-20.9)	4.5 (4.4-4.6)
Kidney	24.5 (19.0-29.9)+	7.2 (4.1-10.2)	11.9 (11.7-12.1)	4.4 (4.3-4.5)
Brain	4.7 (2.7-6.8)-	3.3 (1.5-5.2)	7.0 (6.9-7.2)	5.2 (5.1-5.3)
Non-Hodgkin's Lymphoma	12.4 (8.6-16.2)-	3.4 (0.4-6.5)-	16.2 (16.0-16.5)	7.0 (6.9-7.1)
Leukemia	4.9 (2.6-7.1)+	3.6 (1.6-5.6)-	11.6 (11.4-11.8)	6.5 (6.4-6.6)
Other sites	84.0 (73.8-94.2)	50.2 (42.0-58.4)+	68.6 (68.2-69.1)	36.0 (35.7-36.4)
All sites	414.2 (391.3-437.2)	212.1 (195.2-228.9)	404.0 (402.9-405.0)	203.0 (202.2-203.7)

+ rates are significantly higher than those of the Quebec general population.

- rates are significantly lower than those of the Quebec general population.

Standardized rates of cancer incidence and mortality per 100,000 persons among Aboriginals in Quebec living on reserves and in Northern villages and in the Quebec general population according to cancer site and gender, 1988-2004

	Aboriginal in Quebec living on reserves and in Northern villages		Quebec general population	
MEN - Cancer sites				
	Incidence	**Mortality**	**Incidence**	**Mortality**
Stomach	10.3 (4.9-15.7)	8.4 (3.5-13.2)	14.7 (14.4-15.0)	10.6 (10.4-10.9)
Colorectal	52.3 (40.5-64.2)	20.0 (12.4-27.6)-	64.0 (63.3-64.6)	28.8 (28.3-29.2)
Liver	14.2 (7.9-20.5)+	11.6 (5.7-17.4)+	6.2 (6.0-6.4)	5.4 (5.2-5.6)
Pancreas	11.9 (6.3-17.4)	11.3 (5.6-17.0)	12.2 (11.9-12.4)	11.4 (11.1-11.6)
Lung	131.5 (112.2-150.8)+	109.9 (92.2-127.6)	107.2 (106.3-108.0)	92.1 (91.3-92.9)
Prostate	64.8 (51.1-78.6)-	21.1 (13.2-29.0)	91.7 (90.9-92.5)	23.6 (23.2-24.0)
Bladder	16.7 (9.8-23.6)-	4.4 (0.8-8.0)	34.9 (34.4-35.4)	7.1 (6.8-7.3)
Kidney	27.9 (19.5-36.4)+	7.8 (3.2-12.4)	16.0 (15.6-16.3)	6.0 (5.8-6.2)
Brain	6.2 (2.8-9.7)	4.7 (1.3-8.1)	8.4 (8.1-8.6)	6.3 (6.1-6.5)
Non-Hodgkin's Lymphoma	15.3 (9.1-21.4)	3.6 (0.6-6.7)-	19.1 (18.7-19.4)	8.2 (7.9-8.4)
Leukemia	4.2 (1.4-7.1)-	4.2 (1.1-7.3)-	14.4 (14.1-14.7)	8.2 (7.9-8.4)
Other sites	92.5 (77.0-107.9)	49.3 (37.6-60.9)	84.4 (83.7-85.2)	45.1 (44.6-45.7)
All sites	447.9 (413.0-482.7)	252.6 (225.9-279.4)	473.1 (471.3-474.8)	252.8 (251.5-254.1)

+ rates are significantly higher than those of the Quebec general population.

- rates are significantly lower than those of the Quebec general population.

Standardized rates of cancer incidence and mortality per 100,000 persons among Aboriginals in Quebec living on reserves and in Northern villages and in the Quebec general population according to cancer site and gender, 1988-2004

	Aboriginal in Quebec living on reserves and in Northern villages		Quebec general population	
WOMEN - Cancer sites				
	Incidence	**Mortality**	**Incidence**	**Mortality**
Stomach	5.5 (1.9-9.2)	2.6 (0.0-5.2)-	7.1 (6.9-7.3)	5.3 (5.2-5.5)
Colorectal	60.6 (48.3-72.9)+	14.0 (8.2-19.8)-	46.7 (46.2-47.2)	21.4 (21.1-21.7)
Liver	1.5 (0.0-3.1)	4.3 (1.0-7.6)	2.5 (2.4-2.6)	2.7 (2.6-2.9)
Pancreas	6.8 (2.6-11.0)	3.4 (0.4-6.5)-	9.5 (9.2-9.7)	8.8 (8.6-9.0)
Lung	82.4 (67.9-96.8)+	65.3 (52.3-78.3)+	45.1 (44.6-45.5)	35.2 (34.8-35.7)
Breast	65.7 (53.4-78.0)-	14.3 (8.5-20.0)-	102.8 (102.1-103.6)	30.0 (29.6-30.4)
Cervix	21.3 (14.8-27.9)+	8.0 (3.7-12.2)+	8.2 (7.9-8.4)	2.0 (1.9-2.1)
Body of uterus	9.8 (5.2-14.3)-	0.3 (0.0-1.0)	17.4 (17.1-17.7)	2.2 (2.1-2.3)
Ovary	12.6 (7.2-18.0)	6.8 (2.6-11.0)	14.2 (13.9-14.5)	7.9 (7.7-8.1)
Bladder	2.7 (0.0-5.4)-	0-	9.5 (9.3-9.7)	2.5 (2.4-2.6)
Kidney	21.3 (14.3-28.3)+	6.6 (2.6-10.6)	8.7 (8.4-8.9)	3.2 (3.0-3.3)
Brain	3.3 (1.0-5.6)-	2.1 (0.4-3.9)-	5.8 (5.7-6.0)	4.2 (4.1-4.4)
Non-Hodgkin's Lymphoma	9.8 (5.2-14.3)	3.4 (0.4-6.5)	13.7 (13.5-14.0)	6.0 (5.8-6.2)
Leukemia	5.5 (2.1-8.8)-	3.0 (0.5-5.5)	9.3 (9.1-9.6)	5.2 (5.0-5.3)
Other sites	76.2 (62.7-89.8)+	40.7 (30.3-51.1)+	56.0 (55.4-56.5)	28.8 (28.4-29.2)
All sites	385.0 (354.7-415.3)	174.9 (153.9-195.9)	356.5 (355.1-357.9)	165.6 (164.6-166.5)

+ rates are significantly higher than those of the Quebec general population.

- rates are significantly lower than those of the Quebec general population.

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