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Understanding Lung Cancer

A guide for patients and their families

Index

September 2004

1. Introduction

This information package has been developed for you -- a patient diagnosed with lung cancer. It provides information about lung cancer to help you understand your diagnosis and treatment options. It is hoped that this information will assist you in making an informed decision about your treatment and allow you to participate as a partner in planning your health care.

This information package is not a step-by-step guide to deciding on the best treatment choice for your situation. Remember that every person with lung cancer is different. This information package does not replace consultation with your doctor about your unique circumstances and the treatment options that is best for you.

Understanding Lung Cancer provides background information about lung cancer, how it is diagnosed, and the terminology that doctors use. It also includes a Glossary of terms that are used most often by doctors in the diagnosis and treatment of cancer.

2. What is cancer?

Cancer is not one disease. There are more than 100 different types of cancer. Each type of cancer is due to the same problem – too many cells accumulate.

Normally, cells in your body divide and produce more cells only when your body needs them. However, sometimes one or more cell(s) begin to divide and form more cells than the body needs. When these new cells divide and multiply enough, they form a mass of tissue called a tumour. Tumours are either ***benign*** or ***malignant***.

Benign tumours are not cancerous. They can usually be removed, seldom come back and are rarely a threat to life.

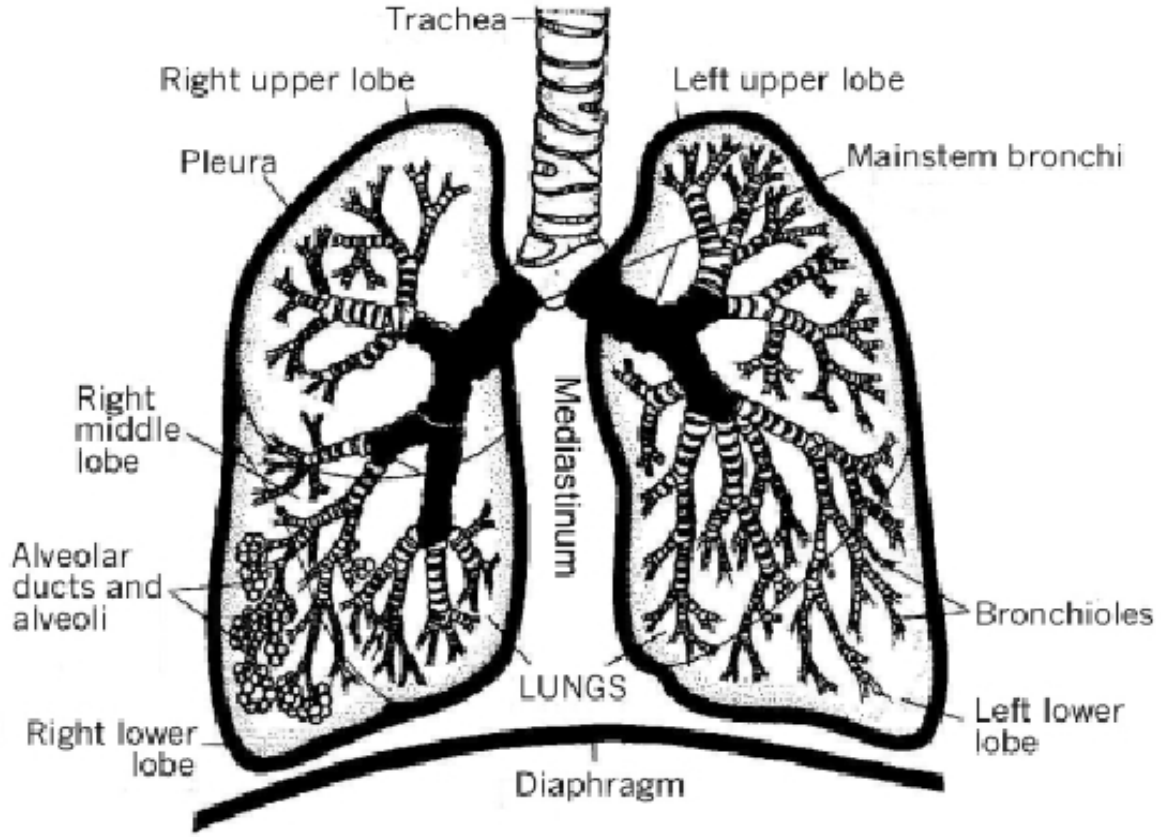
Malignant tumours are cancerous. As cells multiply, they can damage nearby tissue and organs. Cells can break off from the tumour and can travel to other parts of the body by the blood stream or lymph system. The spread of cancer to other parts of the body is called metastasis.

3. What is lung cancer?

Lung cancer occurs when cells develop abnormally in one or both of the lungs and grow out of control to form a tumour. Tumours make it difficult for the lungs to work properly.

There are two major types of lung cancer: **non-small cell** and **small cell**. The terms non-small cell and small cell refer to how the cells look when seen through a microscope. The terms refer to the kinds of cells that make up the tumour not the actual size of the tumour.

Figure A : Diagram of Cross Section of Lungs



The Lungs

The lungs are organs where oxygen in the air is transferred into the bloodstream. The lungs consist of the air passages that carry the air that is breathed to the parts of the lung called the lung parenchyma. The lung parenchyma refers to the tissue where breathed air is allowed to exchange its oxygen with blood that is flowing through blood vessels in the lung tissue.

Non-Small Cell Lung Cancer

Over 75% of all people diagnosed with lung cancer have non-small cell lung cancer (NSCLC). Most people diagnosed with NSCLC are smokers or former smokers. There are four major types of non-small cell lung cancer:

- **Squamous carcinoma**
  This type (also called Epidermoid carcinoma) generally begins in one of the larger breathing tubes (bronchus). It tends to spread less quickly than other forms of lung cancer. It currently occurs most frequently in men and older people of both sexes.

- **Adenocarcinoma**
  This type begins near the outside surface of the lung and can vary in both size and how fast it grows. It is the most common lung cancer among women.

- **Bronchoalveolar**
  This type is a variant of Adenocarcinoma. It causes changes on an x-ray that may be mistaken for pneumonia.

- **Large-cell carcinoma**
  This type may occur in any part of the lung. However, it usually starts in the smaller breathing tubes. Tumours are usually large at the time of diagnosis and occur with the same frequency in men and women.

Small Cell Lung Cancer

Small cell lung cancer (also called oat cell) is a more rapidly growing type of lung cancer than non-small cell lung cancer. Most people diagnosed with small cell lung cancer are smokers or former smokers. It usually starts in one of the larger breathing tubes and it tends to grow rapidly.

Other

Other types of cancer occur in a small number of patients, e.g. carcinoid.

4. What are the major causes of lung cancer?

- **Most people who get lung cancer smoke or have smoked cigarettes.**
- **Exposure to second-hand smoke –** even people who do not smoke can develop lung cancer from cigarette smoke.
- **Environmental factors** – a person's risk of developing lung cancer is increased by exposure in the home or in the workplace to harmful substances such as asbestos.

5. What are the symptoms of lung cancer?

- There is no single specific symptom of lung cancer.
- Symptoms are not always evident during the early stages of the disease.
- Symptoms are varied and can include, for example: a persistent cough, pain, coughing up blood, shortness of breath or hoarseness.
- More frequently, lung cancer is detected after a growing tumour causes symptoms to appear. Sometimes the first symptom of lung cancer is a symptom from a metastasis, for example: bone pain.

6. Why is lung cancer often detected at a late stage?

Most cancer researchers believe that 20 or more years pass from the time that a person starts to inhale a cancer-producing substance, such as tobacco smoke, and the time cancer actually develops.

Lung cancer is very difficult to detect at an early stage. Because of the large size of the lungs, cancer may grow for many years without any symptoms. Symptoms of lung cancer (e.g., persistent cough, etc.) do not always appear in the early stages of lung cancer. Even then, a persistent cough may be diagnosed as bronchitis and treated with antibiotics.

Unlike some other cancers, there is no universally accepted screening test for lung cancer. It is known that chest x-rays and CT scans can detect small tumours. However, these types of tests are usually ordered after the patient has developed symptoms. IN some cases, lung cancer is found during a routine check-up.

7. How is lung cancer diagnosed?

Before treating a tumour, the diagnosis of cancer must be proven by obtaining cells by needle or surgical biopsy. There are a number of tests used in the diagnosis of lung cancer. The number and type of tests that your doctor orders will depend on the kind of information that your doctor requires to get a clear picture about the type of lung cancer you have and to determine if it has spread to other parts of your body. All of this information is required to develop a treatment plan that meets your unique needs.

Some of the diagnostic tests include:

- **Chest X-ray**
- **Sputum cytology**
- **Bronchoscopy**
- **Blood tests**
- **CT scan**

Depending on the results of these tests, your doctor may also request that you undergo tests such as:

- **Needle or surgical biopsy**
- **Mediastinoscopy**
- **Thoracoscopy**
- **Abdominal CT scan**
- **MRI**

Additional information about each of these tests is provided in the **Glossary** at the end of this document.

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8. Staging of Lung Cancer

One of the first things that a doctor does after diagnosing lung cancer is to determine its extent of **stage**. Staging determines if the cancer is limited to the lung or if it has spread to other parts of the body. Because the stage of your lung cancer will have an impact on the selection of the best course of treatment, the doctor needs to determine the stage of your lung cancer before recommending the best course of treatment for you.

The Stage of Non-Small Cell Lung Cancer

Most doctors use the TNM classification system to stage non-small cell lung cancer: "T" refers to the size of the tumour, "N" refers to the lymph node involvement, and "M" refers to metastasis. Staging is based on:

- **The size and location of the primary tumour;**
- **The presence of cancer cells in the lymph nodes; and,**
- **The spread of the lung cancer to other organs.**

All of this information is required to determine the stage of non-small cell lung cancer.

Non-small cell lung cancer has four stages:

Stage I: The cancer is only in the lung and has not spread to the lymph nodes.

Stage II: The cancer has spread to nearby lymph nodes but not to lymph nodes in the area between the two lungs (mediastinum); or
The cancer has spread to the chest wall.

Stage III: The cancer has spread to the lymph nodes in the area between the two lungs (mediastinum); or
The cancer has spread to the lymph nodes on the other side of the mediastinum or to the neck.

Stage III is further divided into:

Stage III-A: – potentially the tumour could be removed (resectable).
Stage III-B: – usually the tumour cannot be surgically removed.

Stage IV: The cancer has spread to one or more other parts of the body, such as the bones, liver, brain, or other organs.

The Stage of Small Cell Lung Cancer:

Small cell lung cancer is usually staged using the terms listed below:

Limited-Stage: The cancer involves one lung and possibly lymph nodes on the same side of the chest as the cancer. The area affected by the cancer can be encompassed by a single radiation treatment.

Extensive-Stage: The cancer has spread beyond the extent of limited-stage small cell lung cancer including other parts of the body such as the bones, liver and brain.

9. What are lymph nodes?

Lymph nodes are clustered throughout the body. They are located mostly in the neck region, the space between the lung (mediastinum), throughout the abdominal region, and in the groin area and the axilla. They are small bean-shaped structures whose function is to remove bacteria, viruses and other substances and supply white blood cells (lymphocytes) to the body.

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10. How is lung cancer treated?

Treatments offered to people with lung cancer vary based on the type and stage of lung cancer and other circumstances such as age, other medical problems, and personal preferences of the individual person. The treatment plan that you will be offered will be developed to meet your personal requirements.

Treating Non-Small Cell Lung Cancer
There are three primary forms of treatment for non-small cell lung cancer.

- **Surgery**
- **Radiation Therapy**
- **Chemotherapy**

The type of treatment or combination of treatments used depends on the type and stage of cancer. Non-small cell lung cancer differs from person to person. There is no easy way to pre-determine how an individual patient will respond to any specific treatment or combination of treatments. While the stage of a patient's cancer will play a prominent role in the development of treatment options, other factors such as general health, other medical conditions and individual priorities about quality of life and survival will need to be considered in the final decision about the treatment plan.

The following is a review of the types of treatments that may be considered for different stages of non-small cell lung cancer. They are general descriptions of approaches to treatment. The information is provided to assist you in your discussions with your doctor and other members of your health care team about treatment options and your treatment plan. Remember, every patient is different. Your treatment options may not be the same as those described below. The potential side effects of the different types of treatment should be discussed with your doctor. In all cases, the treatment offered will have been tested in clinical trials and other research studies to ensure that it has the potential to benefit you.

Non-Small Cell Lung Cancer:

Stage I: Surgery is typically the recommended treatment. For patients with severe lung disease, such as advanced emphysema, or severe heart disease who cannot tolerate surgery, radiation therapy is sometimes used.

Stage II: Similar to Stage I.

Stage III-A: The recommended treatment is often chemotherapy and radiation therapy together. Sometimes chemotherapy with or without radiation therapy followed by surgery to remove the remaining tumour is recommended. At other times, radiation therapy alone to shrink the tumour and relieve symptoms is recommended.

Stage III-B: The recommended treatment is commonly chemotherapy and radiation therapy or radiation therapy alone. Surgery is not generally an option for patients with Stage IIIB non-small cell lung cancer.

Stage IV: Surgery is usually not an option for patients with Stage IV non-small cell lung cancer. Chemotherapy can be used to provide symptom relief and to increase survival time modestly. Radiation therapy may be used to relieve local symptoms and improve the patient's quality of life.

Treating Small Cell Lung Cancer:

There are two primary forms of treatment for small cell lung cancer.

- **Radiation Therapy**
- **Chemotherapy**

While the stage of a patient's cancer will play a prominent role in the development of treatment options, other factors such a general health, other medical conditions and individual preferences will need to be considered in the final decision about the treatment plan.

Small Cell Lung Cancer:

Limited-Stage: Chemotherapy, generally with radiation to the chest and brain, is the most frequently recommended treatment.

Extensive-Stage: Chemotherapy is the recommended treatment, with radiation possibly being used to relieve symptoms.

11. What is radiation therapy?

Radiation therapy is the treatment of cancer with x-rays. At least 50% of patients with lung cancer will require radiation therapy at some point during their illness. Radiation therapy may be used with or without surgery in an attempt to eliminate the tumour (radical radiotherapy) or to reduce its size to relieve symptoms such as pain and shortness of breath. Individual patients respond differently to radiation therapy.

Before starting radiation therapy, you should discuss with your doctor the side effects that you are most likely to experience and the impact that they may have on your quality of life. The number of treatments varies from patient to patient. Each radiation therapy usually lasts between two and five minutes. You will not feel any pain or any other sensation during the treatment. Because you will need to be carefully positioned on a firm table before you receive each treatment, you should allow up to an hour for each radiation therapy treatment when scheduling transportation or other appointments.

12. What is chemotherapy?

Chemotherapy is the treatment of cancer with drugs. There are a number of chemotherapy drugs used to treat lung cancer. Although the chemotherapy drugs work differently, they all kill cancer cells or prevent their growth. A single dose of chemotherapy will only kill a percentage of cancer cells. Therefore multiple doses or cycles are necessary.

Every lung cancer patient is different. How frequently the treatment is given will depend on the drugs being used, how well you tolerate the treatment and how your cancer responds to the chemotherapy. Individual patients respond differently to chemotherapy. Before starting chemotherapy, you should discuss with your doctor the side effects that

you are most likely to experience and the impact that they may have on your quality of life.

Most chemotherapy is given by intravenous injection. Normally, you can expect to receive your chemotherapy as an outpatient at the cancer center or a hospital clinic. Patients are rarely admitted to hospital for chemotherapy treatment.

Chemotherapy treatment normally continues for four to six months. Your individual treatment plan may require that you have a chemotherapy treatment one to four times a month. In addition to your chemotherapy treatments, you will also be asked to have blood tests on a regular basis, sometimes as often as once a week, at the lab near your home. Approximately once a month, you and your doctor will assess whether the tumour is responding to treatment and decide if the treatment should continue.

13. What is palliative care?

The goal of palliative care is to reduce the impact of the symptoms, especially pain. Palliative care is also provided when a cure is no longer possible. Palliative care assists patients to live out their remaining time in comfort and with dignity. Palliative care does not hasten death or prolong life. The aim of palliative care is to provide the patient and the family with the best quality of life.

Palliative care includes the relief of pain and other symptoms. It meets not only the physical needs of the patient but also the emotional, spiritual and psychological needs of patients and their families. It provides support and comfort to both the patient and his or her family. It can provide an important support service to help families cope during the patient's illness and to deal with their own bereavement.

Palliative care is planned and delivered by a team, which includes the patient, family, caregivers, and other service providers. Depending on where the patient resides, palliative care may be delivered in the setting of choice: home, hospice or hospital.

14. What is a clinical trial?

Cancer researchers and doctors are always looking for new and improved ways of treating patients. A clinical trial helps researchers to determine how well a new treatment works, what side effects it produces, and how effective it is in comparison to other available treatments currently in use. Clinical trials may test a new treatment approach or compare two or more effective treatments to determine which one is best.

Patients who volunteer to participate in clinical trials play an important role in clinical research. In addition to whatever personal benefits – better quality of life, longer survival time, etc. – they might gain, some patients see a clinical trial as an opportunity to contribute to a research effort that might benefit others. Patients in clinical trials often are among the first to receive new research treatments before they are widely available, which may prove beneficial.

Participating in a clinical trial may be a treatment option that you might want to discuss with your health care team before making a final decision about your preferred treatment option. If you are interested in participating in a clinical trial, ask your doctor if there are any clinical trials for your type and stage of lung cancer. Consider the medical, practical and emotional issues before making a decision to participate in a clinical trial. It is important that you understand both the drawbacks of the clinical trial and the potential benefits.

The Ontario Cancer Research Network (OCRN) has created a website (www.ontariocancertrials.ca) to help people learn about clinical trials for cancer, where they are taking place and who is eligible to participate. You can search through the database of all cancer trials in Ontario to find trials that may be suitable for you. You can also speak directly to a Canadian Cancer Society Information Specialist to learn more about clinical trials. Call 1 888 939-3333 Monday to Friday 9 am to 6 pm.

You will be required to sign an **"informed consent"** document before starting treatment on a clinical trial. It is important that you fully understand what the clinical trial involves **before** signing the consent form. A decision not to participate in a clinical trial or to withdraw from a clinical trial, for any reason, will not in any way impact on your access to cancer

care. Remember that if you decide to participate in a clinical trial, you have the right to withdraw from the trial at any time, for any reason.

15. What is a practice guideline?

With all of the changes in treatments for lung cancer, it is useful to have consolidated information about which of the advances offer the best care for patients with specific types and stages of lung cancer.

A practice guideline, sometimes called a clinical practice guideline, is a summary of the best evidence that is currently available that can be used by patients and health care providers to develop a treatment plan for each lung cancer patient.

Practice guidelines are developed by health care providers, community representatives (patients or a family member of someone who is living with cancer), and cancer researchers working together as a team. Team members:

- Identify and review all studies including the most recent clinical studies for particular types and stages of lung cancer;
- Analyze all the relevant research data; and,
- Make recommendations about the type of treatment options that should be considered for a patient with a particular type and stage of lung cancer.

Using these practice guidelines, patients and their health care team, can work together to determine the best treatment option. Practice guidelines are an important tool in the development of a treatment plan for lung cancer patients. However, other factors such as general health, other medical conditions and individual patient priorities about quality of life and survival will also be considered in the decision about a preferred treatment option.

While there have been a number of practice guidelines developed for different types and stages of lung cancer, a practice guideline for your particular type and stage of lung cancer may not yet be available.
Ask your doctor if there are any practice guidelines available for your type and stage of lung cancer.

Practice guidelines for health care practitioners and for patients can be found on the Cancer Care Ontario web site:

☼ **http://www.cancercare.on.ca/access_PEBC.htm**

Notes/Questions to ask:

16. What about complementary and alternative medicine?

More and more, people with cancer and a wide range of other diseases are exploring complementary and alternative medicines such as herbal therapy, meditation, visualization and acupuncture. Complementary and alternative medicine also includes a wide range of healing philosophies, approaches and therapies.

When these therapies and approaches are used in addition to conventional therapies such as surgery, radiation therapy and chemotherapy, they are called “complementary medicine” or “integrative health care”. When these therapies are used instead of conventional therapy, they are called “alternative medicine”.

Sometimes, complementary therapies may affect how your conventional therapies are given or how they work. For example, certain vitamins may increase the side effects of conventional therapy or decrease its effectiveness. Before starting any complementary or alternative therapy, discuss your decision with your doctor. Many doctors are becoming more knowledgeable about the different types of complementary medicine.

When considering the use of complementary or alternative medicine as a treatment program, exercise caution and carefully evaluate the potential benefits and risks of any single therapy that you might be considering. Beware of inflated claims. Remember that alternative medicine is not supported by data from carefully planned clinical trials.

Following the steps listed below will help you to evaluate all forms of therapy.

- Learn what therapy options, conventional and alternative, are available to you;
- Identify and assess the research evidence for all complementary/alternative medicine options;
- Get detailed referrals about specific alternative therapies from more than one person;

- Screen the alternative medicine practitioners based on these referrals; and,

- Interview the provider of any alternative therapy you may be considering.

Some complementary and alternative therapies are now being researched. For more updated and detailed information about the evaluation of complementary and alternative medicine, you might wish to contact:

National Center for Complementary and Alternative Medicine
U.S. National Institute of Health
Address: http://nccam.nih.gov/health

This organization was established in 1998 by the U.S. Congress to stimulate, develop and support research on complementary and alternative medicine for the benefit of the public.

British Columbia Cancer Agency
Address:
http://www.bccancer.bc.ca/PPI/UnconventionalTherapies/default.htm

Canadian Health Network
Address: http://www.canadian-health-network.ca

For more information about alternative therapies, you might wish to consult the following publications:

Five Steps To Selecting The Best Alternative Medicine: Mary and Michael Morton, New World Library, 1996.

Love, Medicine, and Miracles: Bernie Siegel, Harper and Row, 1990.

Alternative Medicine: The Definitive Guide: The Burton Goldberg Group, Future Medicine Publishing Inc., 1994.

Notes:

17. Where can I find more information about lung cancer?

With the number of advances in cancer care treatment, a diagnosis of lung cancer does not always have the same prognosis that it had five years ago. One of the best methods of fighting lung cancer is to learn as much as you can about it. You will find listed below some useful resources that you may wish to use when gathering information about lung cancer.

Books and other material
There are a number of books about cancer available. Some books deal specifically with lung cancer while others deal with cancer in general and include one or more chapters on lung cancer.

Books that other lung cancer patients have found useful are:

Living with Lung Cancer: A Guide for Patients and Their Families (4^{TH} Edition), B.G. Cox, D.T. Carr, R.E.L. Lee, and E. Harman, Carr. Triad Publishing, 1998.

What You Really Need to Know About Cancer: A Comprehensive Guide For Patients and Their Families, R. Buckman. Key Porter, 1995.

A word of caution – consider the following when reading any materials such as an information sheet, brochure, pamphlet or book about lung cancer:

- The number and types of treatments change rapidly. Make sure that any treatment information you gather is current.

- Do not buy books unless you want to. Check your local library as well as patient information services or libraries at cancer centers and local hospitals.

- Evaluate the credibility of any print material that you find or are given.

    - When was the document first published?
    - Has it been revised or updated?
    - Is the information current?
    - Is the source reputable?

- Make sure that the information is not biased or misinformed.

CD-ROM:
Understanding Lung Cancer: Oncology Interactive Education Series. Jack Digital Productions Inc., in collaboration with the Princess Margaret Hospital, 2001.

"Understanding Lung Cancer: Oncology Interactive Education Series" is a two disk CD-ROM set for Windows 95, 98, NT. This resource provides a breadth of relevant information from prevention and diagnosis to treatment and supportive care. The computer software allows the general public to explore the many aspects of lung cancer in an engaging and interactive environment. Links to other printed and on-line resources are also provided.

Telephone
Cancer Information Services (CIS)
Call toll-free: **1-888-939-3333**

The Canadian Cancer Society provides a toll-free bilingual information service, Monday to Friday, 9 a.m. to 6 p.m. A clearing-house for cancer information, the service offers information specific to callers' needs in clear simple language.

Professionals and specially trained volunteers provide information over the phone and print information about a range of topics including:

- all types of cancer;
- prevention and detection;
- cancer treatment and the side effects of treatment;
- complementary therapies; and,
- resources available in your local community.

All calls are confidential.

The Canadian Cancer Society's Cancer Information Service also offers an e-mail service similar to the telephone service described above. You can email: info@cis.cancer.ca. Remember that e-mail is not private. If you wish to submit a request for information and keep it private, it is suggested that you call the toll-free number listed above.

For information about smoking cessation programs contact your local office of the Canadian Cancer Society. Look in the white pages of your local directory under Canadian Cancer Society to find the telephone number.

Internet

The World Wide Web has thousands of web sites devoted to cancer. However, it is important to know that information on the Internet is not screened for accuracy.

- Evaluate the credibility of any information that you find or are given.
  - Is the information current?
  - Is the source reputable?
- Make sure that the information is not biased or misinformed.

Be sure to assess the credibility of the information that you find. Individual web sites can provide you with large amounts of information about specific cancers, treatments, clinical trials, the personal experiences of other patients, and alternative medicine.

Lung Cancer Websites:

Alliance for Lung Cancer Advocacy, Support, and Education (ALCASE):

☼ Address: http://www.alcase.org

The Alliance for Lung Cancer Advocacy, Support and Education (ALCASE) is a non-profit organization based in the United States dedicated to helping people with lung cancer improve the quality of their lives. The ALCASE web site contains a wide variety of learning resources, a glossary of terms related to lung cancer and links to other relevant web sites.

Lung Cancer Canada

☼ Address: http://www.lungcancercanada.ca

Lung Cancer Canada is a national charity whose mandate is to raise awareness about lung cancer in Canada and provide support, informational and educational resources to lung cancer patients, their family members and caregivers, and health care professionals. Programs include peer support, professionally-led presentations, print and web-based educational materials, Clear Ribbon Campaign and a variety of informational events.

Other Cancer Information Web Sites:

The Canadian Cancer Society/National Cancer Institute:

☼ Address: http://www.cancer.ca

This web site provides information about the Canadian Cancer Society as well as information about various types of cancer, including lung cancer, and cancer research results.

Canadian Health Network:
☼ Address: http://www.canadian-health-network.ca/

The Canadian Health Network (CHN) is a national health information service funded by Health Canada. The CHN web site provides the Canadian public with current and reliable resources from health information providers across Canada. The site has an extensive collection of resources regarding the prevention, early detection and treatment options for different types of cancer, including lung cancer.

Health Canada: Cancer Bureau:
☼ Address: http://www.hc-sc.gc.ca/hpb/lcdc/bc

The Cancer Bureau provides information on cancer risks, trends and control strategies. Its web site provides links to a large number of other sites including numerous health networks and organizations, medical journals, and sites dealing with nutrition and preventive medicine, and unconventional medicine. The site also includes newsgroups.

Cancer Care Ontario:
☼ Address: http://www.cancercare.on.ca

Cancer Care Ontario (CCO) is the government's principal adviser on cancer issues, with a mission to improve the performance of the cancer system by driving quality, accountability and innovation in all cancer-related services. The CCO web site provides access to practice guidelines for health care practitioners and for patients. Each practice guideline summarizes the best and most relevant research on a specific condition, for example, research on the effectiveness of a certain type of chemotherapy treatment for a certain type and stage of cancer. Based on this summary of data, and with input from specialists, each guideline makes recommendations on cancer care to help health care professionals and patients make decisions about care.

Cancer Care Inc:
☼ Address: http://www.cancercare.org

Cancer Care inc. is a non-profit social service agency based in the United Stages. It provides a wide range of services to people living with cancer and their families including support, information and assistance. The web site has a section on lung cancer including a series of documents called

"Lung Cancer Briefs" offering tips such as communicating with your health care team and the possible benefits of participating in a clinical trial.

OncoLink (University of Pennsylvania Cancer Center):
☼ Address: http://www.OncoLink.upenn.edu/

OncoLink is the first multimedia cancer information resource on the Internet. It is accessible worldwide and there is no charge to use it. Using OncoLink, you can access comprehensive information about specific kinds of cancer, updates on cancer treatments and news about advances in research. The site is updated daily. The design of the site makes it easy for the general public to navigate through the pages to find the information they want.

CancerNet (U.S. National Cancer Institute):
☼ Address: http://www.nci.nih.gov/

This web site provides a comprehensive source of information about cancer, including state-of-the-art treatment, clinical trials and a database of over 1600 open clinical trials including Canadian-based trials.

The Mayo Clinic:
☼ Address: http://www.mayoclinic.com

This web site has a section on lung cancer that includes information on self-care and coping strategies. All material is dated in order that the general public can ensure that the information is current.

Notes/Questions to ask:

GLOSSARY OF TERMS

Lung cancer

- A-	
Adjuvant chemotherapy	the use of anticancer drugs after surgery to decrease the chance of the cancer coming back
Adjuvant therapy	a treatment method used in addition to the primary therapy; used to increase the effectiveness of treatment
Alopecia	loss of hair that can include all body hair; a side effect of some cancer treatments
Alveoli	tiny air sacs found at the end of the smallest branches of the bronchial tree; through the alveoli, oxygen passes into the bloodstream and carbon dioxide passes into the lungs to be exhaled
Anemia	condition caused by a reduction in the number of red blood cells that are produced by the bone marrow; anemia can occur due to cancer itself or from the treatments; symptoms of anemia include fatigue and dyspnea
Anesthetic	drug used to abolish the sensation of pain. May be used locally or generally in which case sleep occurs.
Anorexia	diminished appetite and/or aversion to food
Antibiotic	drug that kills or reduces the growth of bacteria
Antiemetic	drug that reduces or prevents nausea and vomiting
Asymptomatic	lack of obvious symptoms of disease
Atypical	abnormal or not usual
Axillary node	lymph node found in the armpit (axilla)
- B -	
Biopsy	removal of a piece of tissue for analysis by a pathologist which is done by a needle or surgery
Blood cells	general terms describing the three cellular components of the blood (white blood cells, red blood cells, and platelets), all of which are made in the bone marrow
Blood count	routine test that determines the number of white blood cells, red blood cells, and platelets in a sample of blood
Bone marrow	spongy material found inside some bones that produces blood cells

Bone metastases	tumour cells that have spread from the original (primary) tumour to the bone
Bone scan	procedure by which an image of the bones is produced after injection of a radioisotope; used to determine if the cancer has spread to the bones
Brachytherapy	type of radiation therapy treatment; a radioactive source is placed in the area of the tumour
Brain scan	test used to determine if cancer has spread to the brain
Bronchial carcinoma	lung cancer
Bronchi	plural of bronchus; bronchial tubes
Bronchiole	very small tube(s) without cartilage that is the last part of the bronchus before it leads into the alveolus
Bronchoscope	a long thin instrument which is inserted into the throat or nasal passage to examine the larger breathing passages; see fiber optic bronchoscopy
Bronchoscopy	examination of breathing passages with a bronchoscope
Bronchus	either of the two main breathing tubes branching off from the windpipe; one bronchus leads to each lung
- C -	
Cancer cell	cell that divides and reproduces abnormally and is capable of invading other tissues
Carcinoma in situ	early-stage cancer in which the disease is confined to the original tissue in which it started
Carcinogen	substance that causes cancer
Capillaries	tiny blood vessels
Catheter	flexible tube inserted into the body to transport fluids into or out of the body
Cell	the basic building block of all living tissues; comprised of a nucleus (the “brain” of the cell), the cytoplasm surrounding the nucleus, and a cell wall enveloping the cytoplasm
Central nervous system (CNS)	control center for the body; includes the spinal cord and brain
Central venous catheter	special catheter placed in a large vein; left in place as long as necessary to deliver/withdraw fluids or administer drugs
Chemotherapy	a drug or combination of drugs used to kill cancer cells and fight cancer
Chronic	lasting for a long period or time
Combination chemotherapy	treatment using two or more anticancer medications

Combined modality therapy	two or more types of treatment are given either at the same time or in sequence; may include combinations of radiation, chemotherapy, surgery, or others
Complementary therapy	techniques or approaches that may be used in addition to standard treatment (for example, meditation or diet)
Complete blood count (CBC)	an analysis to determine quantities of various components of the blood; see blood count
Complete response	indicates that the cancer has disappeared as a result of therapy; no clinical evidence of cancer found after treatment
Complications	unexpected symptoms or problems resulting from medical treatment such as from surgery, chemotherapy or radiotherapy
Consent form	a form that advises patients about all potential risks and benefits of any treatment they are to receive; used by all hospital and clinics and must be signed by the patient before treatment can proceed.
Cure	term used when there is no sign of disease present in the body and adequate time has passed so that the chances of recurrence of the disease are small.
CT scan or CAT scan (computed axial tomography)	diagnostic test that uses a combination of x-ray and computers to create cross-sectional views of the inside of the body.
Cytology	study of cells, their origin, structure, function
- D -	
Diagnostic procedure	a method used to identify a disease or an abnormality
Diaphragm	a major muscle that separates the chest from the abdominal cavity and helps with respiration
Dysphagia	difficulty with swallowing
Dyspnea	shortness of breath or “air hunger”
- E -	
Edema	swelling of a body part due to the accumulation of fluid in the tissues
Epithelium	a covering or lining; cancers of the epithelium are called carcinomas
Erythema	redness
Erythrocyte	red blood cell that carries oxygen to the cells and carries carbon dioxide away from them
Erythropoietin	a hormone that stimulates cells in the bone marrow to produce red blood cells
Esophagus	the part of the body used to connect the mouth to the stomach i.e. the “swallowing tube”

Excision	removal, by surgery
Expectorant	medicine that helps a person cough up secretions from the lungs
- F -	
Fiberoptic bronchoscope	long thin instrument consisting of a flexible bundle of glass fibers that transmit light throughout their length; allows a better view of breathing passages than a conventional bronchoscope
Fraction	dose of radiation for a single treatment
Fractionation	dividing the total dose of radiation therapy into several smaller, equal doses, delivered over a period of several days
- G -	
Granulocyte	type of white blood cell that fights bacterial infection
Granulocytopenia	a low number of granulocytes which may reduce the ability of the immune system to fight infection
- H -	
Hematologist	a physician who specializes in diseases of the blood
Hematology	the study of blood, blood-producing organs, and blood disorders
Hemoglobin	the iron-protein component in red blood cells that carries oxygen to body tissues
Hemoptysis	coughing up blood in the sputum
Hickman catheter	catheter that is inserted into a large vein near the heart; used for delivery of medications, transfusions and blood sampling.
Hospice	a place or program dedicated to caring for terminally ill patients and their families
Hypercalcemia	abnormally high concentrations of calcium in the blood, which can cause symptoms of nausea, vomiting and constipation, fatigue and sleepiness
Hyperfractionated radiation	the total daily dose of radiation is divided into smaller doses that are given more than once a day
- I -	
Imaging procedures	methods of producing pictures of areas inside the body; includes x-ray, ultrasound, CT scan, MRI, and nuclear medicine scans
Immune function	production of cells that fight disease or infection
Immune response	the activity of the immune system against foreign substances (antigens)
Immune system	a system within the body that recognizes and fights foreign cells and disease
Incision	a cut, usually used in reference to a surgical incision

In-situ	in place, localized and confined to one area; a very early stage of cancer
Infection	the invasion and multiplication of disease-producing organisms
Informed consent	legally required procedure to ensure that a patient knows about the potential risks and benefits of a treatment before it is started
Intravenous	within, or administered into, a vein
Invasive cancer	cancer that has spread beyond its site of origin and is growing into surrounding, health tissues; also called infiltrating cancer
- L -	
Larynx	the voice box, located above the windpipe
Lesion	an abnormal change in the structure of an organ or part due to injury or disease
Leukocyte	also known as white blood cell (WBC)
Leukopenia	low number of leukocytes or WBCs; decreases a person's ability to fight infection/disease
Lobe	division of a body organ, such as the lung or liver, marked by a fissure (crease) on the surface; there are usually two lobes in the left lung and three lobes in the right lung
Lobectomy	surgical removal of one lobe of a lung
Local treatment	treatment that affects a tumour and the area close to it
Locally advanced cancer	cancer that has spread only to nearby tissue or lymph nodes
Lung metastases	tumour cells that have spread from the original (primary) tumour (not lung cancer) to the lung
Lymph	an almost colorless fluid that travels through the lymphatic system to help fight infection/disease
Lymph node	small bean-shaped organ that acts as a filter to collect bacteria and other foreign substances from the lymph system to be processed by the immune system; lymph nodes are connected by lymphatic vessels throughout the body
Lymphatic (lymph) system	network including the lymph nodes, lymph cells, and lymph fluid; can also be an avenue of spread for cancer cells
Lymphocyte	a type of white blood cell that fights virus and other foreign substances
- M -	
MRI (magnetic resonance imaging)	a test that uses a magnetic field to create two-dimensional images of the body ; similar to a CAT scan but uses magnets instead of x-rays

Malignant mesothelioma	a malignant tumour that starts from the lining of the chest cavity or covering of the lungs; this type of lung cancer has been linked to exposure to asbestos
Mediastinum	the area between the two lungs containing structures such as the esophagus, trachea and heart
Medical oncologist	a doctor who specializes in the treatment of cancer using chemotherapy
Mediastinoscopy	a surgical procedure which examines the lymph nodes along the windpipe under the breastbone for presence of cancer or other disease
Metastasis	the spread of cancer cells from the original site to other parts of the body
Metastatic cancer	cancer that has spread from one part of the body to another
Modality	a type or kind of treatment (surgery for example)
Mucositis	inflammation of the mucous membranes (for example, the mouth) that causes pain, soreness and/or excessive mucus production
Multimodality therapy	therapy that combines more than one method of treatment such as chemotherapy and radiation
Myelosuppression	suppression of blood cell production
- N -	
Nausea	the symptom indicating the inclination to vomit
Needle aspiration biopsy	the withdrawal of fluid or cells from a part of the body for examination under the microscope
Neoadjuvant therapy	therapy given before the primary treatment to treat a cancer to improve the effectiveness of the primary treatment; neoadjuvant therapy can be chemotherapy or radiation therapy
Neurologic(al)	involving the nerves or nervous system
Neuropathy	the malfunction of the nerves which may be caused by chemotherapy; numbness and weakness are common symptoms
Neutropenia	low number of neutrophils or white blood cells; may increase the risk of infection, depending on how low the count is and for how long
Neutrophil	type of white blood cell used to fight bacterial infections; granulocyte
Neurotoxicity	the tendency of some treatments to cause damage to the nervous system

- O -	
Oncologist	physician who specializes in the study, diagnosis, and treatment of cancer
Oncology	the study of the development, diagnosis, treatment and prevention of cancer
- P -	
Parietal pleura	the membrane that lines the chest cavity
Pathologic fracture	a broken bone often caused by metastases to the bone or other disease-related problems
Pathology	study of the nature of disease and its causes, processes, development and consequences
Peripheral neuropathy	this condition may be caused by disease or treatment, and includes the inflammation, injury or degeneration of the peripheral nerve fibers.
Phase I clinical trial	the phase of clinical research in which the safety and dosage levels are being evaluated; because these treatments are new, there may be risks to participants; therefore, these trials are only open to a small number of participants who have advanced disease
Phase II clinical trial	these trials focus on the tumour response and side effects that may not have been seen in Phase I trials; phase II trials are open to a larger number of participants
Phase III clinical trial	evaluates safety, efficacy, dosing and side effects in a large group of patients compared to a standard treatment
Phase IV clinical trial	a trial of treatment after approval by the Food and Drug Administration (FDA) in the united states, or by the Health Protection Bureau (HPB) in Canada and the treatment is available on the market
Plasma	liquid part of the blood, lymph, and intracellular fluid in which cells are suspended
Platelet	blood cell that helps to control bleeding by causing clotting; also called thrombocyte
Platelet count	measurement of the number of platelets in the blood
Platinum-based therapy	the use of a combination of chemotherapy drugs, one of which contains the drug cisplatinum
Pleura	two thin membranes, separated by fluid, that cover the lungs and line the chest cavity
Pleural effusion	fluid that collects between the lung and the lining of the chest wall; also called pleural fluid

Pleurodesis	a procedure using talc or chemicals to eliminate the space between the lining of the lung and the lining of the chest cavity to prevent the build-up of fluid within that space
Pneumonectomy	surgical removal of one lung
Positron Emission Tomography (PET or PET scan)	a scanning mechanism that produces images of the inside of the human body and its metabolic functions
Primary tumour	tumour at the original site where the cancer began
Psychosocial support	support designed to meet psychological and social needs
- R -	
Radiation oncologist	physician who specializes in the treatment of cancer with radiation therapy
Radiation surgery	also known as radiosurgery or stereotactic external beam irradiation; a type of therapy that delivers a single high dose of radiation directly to the tumour, sparing the healthy tissue from the effects of the radiation
Radiation therapy	x-ray treatment that damages or kills cancer cells
Radiologist	a physician with training in reading diagnostic x-rays and performing specialized x-ray procedures
Recurrent cancer	cancer that has come back after treatment; recurrent cancer may occur in the original site or it may return elsewhere in the body
Red blood cell (RBC)	blood cell that carries oxygen to the cells of the body and removes carbon dioxide
Regimen	the plan that outlines the dosage, schedule and duration of treatment
Regional involvement	the spread of cancer from its original site to nearby surrounding areas
Regression	reduction in symptoms or disease process
Remission	disappearance of cancer and its symptoms; does not always mean the individual has been cured
- S -	
Screening	a procedure or procedures to determine if disease is present where there are no symptoms.
Secondary tumour	a tumour that develops as a result of metastases or spread beyond the original cancer to another part of the body
Segmental resection	refers to the surgical removal of an anatomic segment of tissue (e.g. lung tissue); lobes of the lung are divided into segments by creases

Side effect	an effect on the body caused by cancer treatment other than the effect on the cancer; also called adverse reaction
Simulation	process involving special x-ray pictures that are used to plan radiation treatment
Solid tumour	cancer of the body tissues other than blood, bone marrow or lymphatic system; lung cancer is classified as a solid tumour
Sputum	mucus from the bronchial tubes
Sputum cytology	examination of cells in sputum using a microscope, usually used to look for presence of cancer cells
Standard treatment	treatment that has been proven effective and is commonly used
Steroid therapy	treatment with corticosteroid drugs to reduce symptoms of inflammation such as swelling and pain
Stomatitis	inflammation of the mouth
Subcutaneous port	a device placed beneath the skin and connected to a catheter in a vein for delivery of medication or fluids
Surgical biopsy	surgical removal of a segment of tissue for analysis
Surgical resection	removing tissue from the body through a surgical procedure
Systemic disease	disease that affects the whole body rather than only an organ
Systemic treatment	treatment that reaches cells all over the body by traveling through the bloodstream
- T -	
Terminal	a term used to describe an advanced stage of disease with limited life expectancy
Therapy	treatment
Thoracentesis	removal of fluid, by needle, from the space between the lungs and chest wall
Thoracic	relating to the thorax or chest
Thoracic surgeon	a physician who performs surgery on disease and injury in the thoracic area
Thoracoscope	instrument fitted with lighting system and telescopic attachment, designed for examining the inside of the chest cavity (thorascopic examination)
Thoracotomy	surgical procedure in which an incision is made through the chest wall to examine structures in the chest for the presence of cancer or other disease
Thorax	the upper part of the trunk between the neck and the chest
Thrombocyte	blood cell that helps to control bleeding by causing clotting; also called platelet.

Thrombocytopenia	low number of thrombocytes (platelets) in the blood which could increase the risk of bleeding (hemorrhage)
Thrush	a yeast infection of the oral (mouth) cavity
Tolerance	ability to endure the effects of a drug without exhibiting the usual unfavorable side effects
Toxicity	unwanted effects of treatment
Trachea	windpipe; leads from the larynx to the bronchial tubes
Tumor	abnormal growth of cells that may be benign or malignant
- U -	
Ultrasound	medical test that uses sound waves to create the image of the inside of the body
Unresectable	cannot be surgically removed
- V -	
Vein	blood vessel that carries blood from the body to the heart
Venipuncture	procedure in which the vein is punctured in order to draw a blood sample, to give a medication, or start an intravenous drip
Video-assisted thorascopic surgery	surgery using a video camera attached to a thoracoscope to project and enlarge the image of the tumour seen in the chest cavity on a television screen
Visceral pleura	the part of the pleural membrane which surrounds and separates the different lobes of the lung
- W -	
White blood cell (WBC)	term for variety of cells that are part of the immune system and fight infection, produce antibodies, and attack and destroy cancer cells in the body
White blood cell count	measurement of the total number of white blood cells
- X -	
X-ray	high-energy electromagnetic radiation that is used in low doses to obtain an image of the inside of the body to diagnose disease and in high doses to treat cancer