This curriculum guide provides the teacher with a variety of suggestions intended to assist students in the seventh-, eighth-, and ninth grades to develop proper attitudes regarding cancer and its prevention. In addition, learning experiences are suggested with the intent to teach students about the importance of early detection and treatment of cancer. Finally, teachers are provided with basic cancer information that will enable them to deal appropriately with student questions. Upon completion of the unit, the student will be able to (1) show how cancer is an abnormal process in cell growth for tissue development and replacement, (2) describe how cancer is a group of diseases representing an exaggerated response of the body's protective mechanism against internal and external irritants, (3) discuss why the cause of cancer is non-specific and can be attributed to identifiable combinations of genetic and environmental factors, (4) identify habits and hazards considered as causative or contributory factors in cancer development, (5) identify the common sites of cancer in human beings, (6) list services available for early detection of cancer growth, (7) describe what the individual can do for the early detection, prevention, and control of cancer, (8) give examples of cancer research efforts, and (9) develop a plan of personal action for cancer prevention and control. The text of the guide is divided into three columns per page, dealing with concepts, activities, and supplementary information for the teacher. A glossary of terms is included and seventeen appendixes of charts, graphs, and drawings expand on information contained in the text. (HB)
HEALTH EDUCATION:
CANCER PREVENTION AND CONTROL

Curriculum Guides
Grades 7, 8, and 9

The University of the State of New York/The State Education Department
Curriculum Development Center/Albany 12234

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1976
The University of the State of New York

Regents of the University (with years when terms expire)

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The incidence of cancer can be greatly reduced. This is essentially true of most of our nation's major health problems. These reductions can be affected through an enlightened populace. An in-depth discussion of the prevention of cancer, its causes, the importance of early diagnosis and treatment can provide individuals with the information necessary for them to take appropriate personal actions. For example, one can learn to eliminate behavior which contributes to cancer development, e.g., cigarette smoking and over-exposure to the sun; the truth about the causes and consequence of cancer, thus eliminating misconceptions; the importance of early detections and where to go for competent treatment. Not only would the incidence of cancer be reduced significantly, but thousands of deaths would be prevented.

This curriculum guide provides the teacher with a variety of suggestions intended to assist students to develop proper attitudes regarding cancer and its prevention. In addition, learning experiences are suggested with the intent to teach students about the importance of early detection and treatment of cancer. Finally, teachers are provided with basic cancer information that will enable them to deal appropriately with student questions.
OBJECTIVES

At the completion of the unit in health education dealing with cancer prevention and control, the student will be able to:

1. Show how cancer is an aberrant process in the biological phenomenon of cell growth for tissue development and replacement.

2. Describe how cancer is a group of diseases essentially representing an exaggerated response of the body's protective mechanism against internal and external irritants.

3. Discuss why the cause of cancer is nonspecific; that cause can be attributed to identifiable combinations of factors, such as genetic and environmental.

4. Identify personal habits and occupational hazards which are considered as causative or contributory factors in the development of cancer.

5. Identify the common sites of cancer in children, in males, and in females, and associate these with the possible and traceable causes.

6. List the community services available to the public for early detection of the commonly occurring forms of cancer.

7. Describe what the individual can do for the early detection, prevention, and control of commonly occurring forms of cancer.

8. Cite examples of research efforts in the treatment, control, and cure of cancer.

9. Develop a plan of personal action as an individual contribution to the efforts aimed at cancer prevention and control.
I. Cancer Occurrence

Cancer is a major health problem in our country. Many people believe cancer is a consequence of modern living.

Show and discuss the rise in cancer incidence since 1900 compared to changes in incidence of other major diseases.

Collect newspaper reports of famous people who have died from or been treated for cancer. (ACS "1976 Cancer Facts and Figures," 15018.)

Encourage students to speculate on the reasons for this increase.

- What evidence is there to support this contention?

- What changes in living have taken place that may contribute to a higher incidence of cancer?

- What kinds of cancer are essentially related to living patterns?

- What effect has increased life expectancy had on the increased incidence of cancer?

The increase in incidence is only apparent for the following reasons:
1) Increase in population
2) Increase in average life-span
3) Increase in cigarette smoking
4) Better diagnosis

Use graphs to demonstrate:
1) Increased population.
2) Decline of deaths from infectious disease and increase in chronic disease.
3) Increase in lung cancer following increase in cigarette sales.

Cancer mortality has increased 7 times since 1900. (See Appendix XIV.) The chance of an individual developing cancer has increased five times.

The following reasons for this increase have been suggested although not proven: increased pollution, food additives, atomic tests, chemical growth stimulants, changes in diet, rapid pace of life, water fluoridation.

In the United States, millions of people drink naturally or artificially fluoridated water. Epidemiological studies have shown that the incidence of cancer is no higher among these people than among those with fluoride-free water supplies. Exhaustive tests with laboratory animals under controlled conditions have also demonstrated the safety of water fluoridation. Fluorine compounds are also derived from the soil and from food. These compounds are not carcinogenic.

The U.S. population has tripled since 1900. However, this does not account for all of the increase in cancer incidence.

Increased availability of medical care and improvements in diagnosis and record keeping mean that many more cases of cancer are being diagnosed for what they really are. The feeling that cancer was a disease to be ashamed of stifled
Some people are becoming aware of the nature of cancer because it is more openly discussed.

Cancers related to smoking kill approximately 100,000 people a year. Cigarettes did not become commercially popular until around 1920. (See Appendix X.)

Cancer is primarily a disease of old age. (84% after age 55) The conquest of infectious diseases has enabled many people to live to an age when they are likely to die of chronic diseases such as cancer and heart disease. The process of change from normal to abnormal can be very slow. In fact as stated earlier, a high percentage of cancers do not appear until late middle age or old age.

Discuss some factors of modern life which may have increased the incidence of cancer according to the following:

1) Mass production and marketing of cigarettes.
2) Air and water pollution by carcinogenic chemicals from factories, cars and homes.

Discuss the issue: The technology which has made life more comfortable by alleviating some health problems has created new and more serious health concerns.

Other advances may increase the cancer rate. For instance:

1) Supervision of flight may destroy the protective ozone layer, exposing people to greater risk of skin cancer caused by the sun.
2) Use of atomic energy may increase exposure to radiation from nuclear plants and nuclear waste. This would increase cancer risk.

There are many complex problems which need to be solved, especially in regards to determining whether the benefits to society of technology outweigh the possible harmful effects.
The decline in stomach cancer is possibly related to improvement in methods of preserving food.

Discuss some factors in modern life which have decreased the incidence of cancer.

- Why has stomach cancer declined in the U.S. since 1930?
- Why does stomach cancer remain relatively high in Japan?
- What is the relationship of mold in corn to liver cancer in the inhabitants of Africa?
- Discuss the high incidence of urinary bladder cancer in Egyptian farmers.

The incidence of liver cancer is far rarer in countries with modern methods of food storage and preservation. (See Training Manual for discussion on "The Nature of Cancer").

Why is liver cancer not a serious health problem in the United States?

How can it be prevented?

What part of the world has a high incidence of liver cancer? Why?

Aflatoxin, a chemical product of the mold aspergillus flavus, causes cancer in laboratory animals. In the U.S. and Europe, the occurrence of such mold in the diet is rare. In Africa, corn supplies are sometimes contaminated by this mold and scientists suspect it may be the cause of the high liver cancer incidence in that area.

Scientific investigation has given Egyptians information they need to avoid a naturally occurring cause of cancer.

Egyptian agricultural workers who stood in Nile river waters while working were exposed to flukes (Schistosoma) which burrow through the skin and eventually settle in the urinary bladder. This
Many medical advances in the past became useful only when the general public became informed and made use of them, e.g., small pox and polio vaccines, chest x-rays for tuberculosis.

II. Cancer - The Disease

Cancer is a large group of diseases characterized by abnormal cell growth.

Discuss the decrease in diseases such as small pox and polio. Have students explain what has brought about this decrease. What is the relation, if any, to technological medical advances for detecting and treating these cancers? How can an informed public contribute to a decrease in cancer? What actions can each person take to reverse the incidence of cancer?

What is normal cell growth and differentiation?

How is it related to abnormal cell growth?

What makes a cell become abnormal?

Use ACS teaching kit, "The Nature of Cancer," Junior High School, #2059.01, Lesson I, Activity A.

List the various kinds of cells in the body and state their purpose.

- Is it true that cancer can occur in all of these cells?
- What kinds of cells are more susceptible to developing cancer?

Discuss differentiation - how a "general" cell becomes "special" and performs a special function.

Irritation has been linked to a high incidence of bladder cancer which has been common in Egypt since the Pharaohs.

The same scientific advances which have made diphtheria, small pox and polio rare today are now being applied to cancer. While cancer in young people is relatively rare, it is important to understand the disease so one may protect himself and his family against cancer. Cancer is the leading disease cause of death of children ages 1-15.

"The Nature of Cancer" is an excellent teaching aid using overhead transparencies and a lesson plan, available from the local county unit of ACS.

The body is made up of trillions of cells. Cells are made differently because they have different functions and structure - bone cells, muscle cells, brain cells, fat cells, etc. (See Appendix II.)

Cell differentiation is the process by which cells from the union of an egg and a sperm assume varying structure and functions in the body.
Each of the four basic structures of each cell perform a specific function for the life of the cell.

Diagram a typical cell and discuss the function of nucleus, cytoplasm, chromosomes, and plasma membrane.

- Which of these structures control the growth and reproduction of the cell?
- Is there a relationship between this structure and normal and abnormal cell division?

Discuss the process of normal cell division - mitosis.

Cancer cells do not contribute to the function of the tissues to which they belong.

Compare to the uncontrolled abnormal division which is a typical of cancer.

Show ACS film, "From One Cell", #2348.


III. Causes of Cancer

The cause is nonspecific, since no one single factor is a cause of all or most cancers.
(See Training Manual for a listing of "Carcinogens in Man").

"The Nature of Cancer", Junior High School, #2059.01, Lesson 1, Activity B, ACS.

Although cells may look different and perform different tasks, they are basically alike.

The nucleus contains hereditary material and controls most of the life activities of the cell. Chromosomes carry the hereditary message which determine the cells structure and function. Cytoplasm is a storehouse of chemical substances used by the cell for its life activities. The plasma membrane controls the passage of materials into and out of the cell.

In normal cell division the nuclear material, including the chromosomes, is divided into two sets. The cytoplasm pinches off to form two new daughter cells. (See appendix III.)

In abnormal division the nuclear material and cell may divide into 3 or more daughter cells. Cancer cells tend to become less specialized through a process of dedifferentiation. The cell no longer performs the assigned task, and no longer is working for the benefit of the body. In other words, a dedifferentiated cell is one where there is a loss in structure and function.
Several "causes" of cancer have been identified.

Discuss the studies associated with the identification of cancer-causing factors.

Factors that may contribute to the development of cancer are:

Chemicals, such as from cigarette smoke;
Radiation - natural (sun) and artificial (x-rays);
Viruses
Hereditary Susceptibility

Experimental confirmation of chemical carcinogenesis was by Yanagiwa and Ichikawa. Describe their experiment.
- What did this 1915 experiment show?
- How is this related to human cancer?
- Define a carcinogen.
- Give at least two common examples.

Cigarette smoke contains chemicals known to cause cancer. Use a smoking machine from ACS Smoking Simulator, #2732, to demonstrate tar in cigarettes or set up a simple experiment in destructive distillation to collect cigarette tars. Point out that these tars collect in the lungs, mouth and throat.

Radiation has been identified as the cause of some cancers. Read and discuss:
1) News accounts of the results of radiological accidents.
2) Accounts of the results of bombing Hiroshima and Nagasaki.

Invite a speaker from a local hospital or health department to discuss medical uses of radiation and steps taken to protect the public from over exposure.

Other scientists have isolated specific substances in tar as the specific cancer-causing or carcinogenic agents. These substances are hydrocarbons (products of the incomplete combustion of organic materials). Hydrocarbons are found in auto exhaust, home and factory emissions, and cigarette smoke.

Radiation from the sun is the main cause of skin cancer. Solar radiation may cause skin cancer in anyone, but light-skinned Scandinavians do not have high incidence of skin cancer in their cloudy native lands. However, when they move to sunnier, geographic locations the incidence of skin cancer increases. Persons of Irish and English descent living in Australia have a high
Even though viruses have been found to cause cancer in laboratory animals, there is no evidence that cancer is contagious. (See Training Manual for a discussion on "Is Cancer Contagious?")

There is some evidence in people showing increased susceptibility to cancer through heredity. This has already been established in animal models.

- Which forms of cancer do scientists believe may be caused by a virus?
- Do scientists understand how viruses may cause cancer?

Viruses are minute organisms which act as parasites in living cells and can reproduce only in cells. Cells so infected are called host cells. Viruses cause such diseases as influenza and polio and have been shown to cause cancer in animals. It is suspected they are a cause of at least some human cancers, e.g., leukemia. They probably cause cancer by altering the chromosomal chemistry and changing the genetic message. Viruses can be seen only with an electron microscope. (See Training Manual - "The Virus and Cancer").

Familial aggregations of cancer have long attracted attention. Nearly everyone knows at least one person who has had several close relatives with cancer. However, cancer is a common disease and some such "clustering" of cases would be expected on the basis of chance alone. In studying this problem, the appropriate question is whether such clustering exceeds that to be expected on the basis of a random distribution of cases throughout the population, and if this is so, what is the magnitude of the excess risk among relatives of cancer patients?

- Do cancers "run in families?"
- What is the explanation given by scientists? (See Training Manual - "Does Cancer Run in Families?")
There is evidence that certain specific cancers may be related to familial factors. Explain why life-style and hereditary susceptibility or resistance can contribute to different cancers.

- Smoking and lung cancer.
- Fair-skinned sailors and skin cancer.

Hereditary susceptibility appears to be associated with the incidence of cancer. Explain, both from a life-style viewpoint and genetic viewpoint, why brothers and sisters, especially identical twins, may have a higher incidence of certain kinds of cancer.

Tumors seem to occur more frequently than expected in offspring of parents with tumors, i.e., hereditary susceptibility appears to play a role. When an identical twin has childhood leukemia, the probability that the other twin will develop the disease within 1-2 years of the date of diagnosis of the first twin is about 1 in 5, a magnitude of risks far exceeding the prevailing level in the general population.

Virtually every form of cancer which has been studied in the laboratory has shown an increased frequency in some species and strain of animals. It would be surprising if the same were not true for cancer in people. The results of animal work on strain differences in the risk of cancer suggest that human studies should consider familial patterns of risk for specific forms of cancer as well as all forms combined.

The limited data available suggest some increased familial risk of developing cancer of the following sites: female breast, stomach, large intestine, endometrium, prostate, lungs, and possibly ovary. However, it is not known whether the observed familial aggregation of these tumors is due to genetic characteristics or to environmental factors, such as diet or occupation, which may be similar from one generation to the next.

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IV. Environmental Causes of Cancer

The risk of cancer can be increased by:
1. cigarette smoking
2. occupational hazards

Cigarette smoking causes lung cancer and is related to cancer of the mouth, larynx and bladder.

The more one smokes, the greater the risk.

Discuss cigarette smoking as an example of how various factors may combine to increase the risk of cancer.

"The Nature of Cancer", Junior High School, Lesson II for the relationship of smoking to cancer, ACS, 2059.01.

Appoint students to read and report on epidemiological studies of smoking and lung cancer, noting methods employed. Same for oral, larynx and bladder cancer.

Discuss: Why do people smoke?

Make a list of benefits and one of hazards related to smoking. Include both personal and social aspects.

Show ACS film, "The Embattled Cell", #2397

There are certain occupations which expose an individual to carcinogens.

Have the class speculate on the relationship between occupation and incidence of cancer in the following occupations:
1) Asbestos workers
2) Radiologists and x-ray technicians.

In general the more a person smokes, the more carcinogenic tars he is exposed to and the greater the risk of lung cancer. However, this risk is affected by the amount of AHII (aryl hydrocarbon hydroxalase) in all cells, which facilitates the metabolism of hydrocarbons.

The level of AHII is determined genetically (although all individuals have at least some). Thus heredity may play a role in lung cancer. In addition, some scientists believe the chemicals may activate a virus latent in the cell. Thus, three variables would combine to produce lung cancer.

(See Training Manual for discussion of "Blood Tests for Cancer").

People who work in certain occupations have a higher risk of developing cancer than those who are not. The following are typical examples:

1) Inhalation of asbestos fibers causes cancer in the lung and peritoneum. Workers employed in the application of asbestos have high risk of lung cancer. Such workers who smoke have an even higher risk.

2) Repeated exposure to low energy radiation, i.e., x-ray, causes skin cancer and leukemia. Today,
People working in occupations that have a higher incidence of certain types of cancer than the general population should take extra precautions to protect themselves.

3) Workers employed in the production of polyvinyl chloride plastic.

4) Coke oven workers.

5) Copper, radium and uranium miners.

6) Aniline dye workers.

7) Chimney sweeps.

protective measures are routinely used to prevent such occurrences. Patients occasionally exposed to radiation do not suffer such high risks.

3) The inhalation of vinyl chloride in the air of factories engaged in polyvinyl chloride production can cause liver cancer. (The use of vinyl chloride gas as a propellant in aerosol products has been banned, as has food packaging made of polyvinyl chloride.)

4) Tarry fumes of coke contain hydrocarbons similar to those found in cigarette smoke. People who work on coke ovens have a risk of developing lung cancer.

5) The inhalation of radioactive particles and certain heavy metal dusts causes respiratory cancers.

6) Certain chemicals (e.g., naphthylamine) once present in dyes were highly carcinogenic, causing bladder cancer. Manufacturing processes have been changed to protect workers.

7) In the late 18th century, Dr. Percival Pott showed that chimney sweeps, exposed to large amounts of soot, were more likely to develop cancer.
Discuss preventive actions which are taken to protect such workers.

Visit a local industrial or processing establishment and see various aid and devices used to reduce environmental hazards. How do they work? Are some more effective than others?

Write the Occupational Safety and Health Administration, Washington, D.C. 20210 for further information on industrial exposure to carcinogens.

Industrial pollution may affect the general population as well as workers, and efforts are being made to control this pollution.

Discuss how carcinogens can enter the environment from industry. What are the most common kinds? What industries are more apt to pollute?

Have students report on carcinogens in the air and water. How do they get into the air? the water?

Invite a speaker from the county health department or pollution control agency or industry to discuss pollution controls. What steps are being taken to reduce pollution? How effective are they?

Write a letter to the editor concerning the pollution problem.

Exposure to carcinogens which enter the environment from industry is far lower than that of those persons occupationally exposed. However, air and water pollution may be a problem, especially for people in proximity to such industrial plants.
CONCEPTS

Environmental pollution may increase the dangers of developing cancer in some people.

V. The Major Sites of Cancer - Prevention and Detection of Cancer

There are over 100 kinds of cancer which can occur anywhere in the body.

There are three chief types of cancer; those of the epithelial tissues, those of the connective tissues, and those of the lymph and blood-forming organs. (See Training Manual for discussion of "Cancer Sites").

ACTIVITIES

Have a committee of 3 or 4 students make a survey of the community to determine kinds and sources of pollution.

Students may collect newspaper and magazine clippings on the pollution problem. What role do local and State political bodies play in pollution control? Contact the Assembly-person to determine his/her awareness and attitude.

Write the Environmental Protection Agency for information on environmental carcinogens.

Examples:
1) Air pollution from vinyl chloride, soot and tars.
2) Water pollution from manufacturing wastes.

SUPPLEMENTARY INFORMATION

Just as there are many different kinds of cells, there are different kinds of cancer.

Cancer falls into 3 main categories:

Carcinoma - cancer of the epithelial cells, such as skin, lining of the gastrointestinal tract, lining of the respiratory tract, or lining of ducts (as in the breast).

Sarcoma - cancer of connective tissue such as bones, muscles, or nerves.

"Diffuse" or "Liquid" Tumors - cancer of the lymph and blood-forming organs such as the leukemias (acute & chronic myeloids and lymphatic leukemias).
It has been found that cancer occurs more frequently in some parts of the body than in other parts. Skin cancer, the most common form, may be prevented by avoiding excessive exposure to the sun. Skin cancer is detected by changes in the color or size of a wart or mole and "cuts" which do not heal. Skin cancer is the most common cancer, is the most curable of all types of cancer.

Information about cancer is available from Can-Dial, a toll-free telephone access system. Students may call 1-800-462-1884 to hear a tape on cancer. Can-Dial is a service of RPMI in Buffalo, N.Y. (See Appendix XVII for list of tapes.) Have a small group of students research the reasons why some forms of cancer are more prevalent than others.

Discuss who is most susceptible to skin cancer.

Discuss means of diminishing exposure to sun's rays:
1) Take your sunshine in small doses.
2) Wear a broad-brimmed hat, long-sleeved shirt.
3) Use a beach umbrella
4) Use screening lotions and creams.


Discuss the following:
1) Is skin cancer easily detected? How?
2) What is the mortality rate? What should it be? Why is it higher than it should be?
3) How is it treated?

Skin cancer, the most common cancer, is the most curable of all cancers. Present methods of treatment are surgery or radiation therapy. New non-surgical methods have been developed which are simple and painless.
Most lung cancer will be prevented through:
1) Not Smoking
2) Protecting individuals occupationally exposed to pollutions.

Discuss the causes of lung cancer:
Smoking
Occupational Exposure

Prepare a survey of cigarette ads from magazines and newspapers. What are these ads saying? Does the image conform with reality?

With students, cite and discuss reasons people smoke.

Discuss: Many people recognize the dangers of smoking and switch to "low tar" brands. Many manufacturers attempt to fulfill this desire by producing filter cigarettes.

Various filter cigarettes may be tested using a smoking machine or by blowing smoke through a tissue. It will be seen that much tar gets through the various filters. (Use ACS "Smoking Simulator" #2732).

By the time most lung cancers are detected they have progressed too far to effect a cure.

No cigarette is safe.

How safe are filters on cigarettes?
Is there a significant difference between brands?
Are some cigarettes safer than others?
Is there a safe tar level in cigarette smoke? Explain.
How important is a periodic chest x-ray, especially for smokers?

(See Training Manual for discussion of "Marijuana and Lung Cancer").

No filter has been developed which makes a cigarette safe. In general, the less tars a cigarette produces, the less dangerous it is. However, even small amounts of tar can be dangerous.
Marijuana, like tobacco, produces carcinogenic tars. Despite reports that THD (tetrahydrocannabinol) is a tumor inhibitor, there is no reason to believe smoking marijuana prevents lung cancer. It most probably contributes to it.

At least 75% of lung cancer is caused by cigarette smoking. Almost all the rest is caused by inhaling certain dusts and chemicals.

Smoking is a personal decision. People choose to smoke or not to smoke. If an individual wishes to avoid lung cancer, he should not smoke.

There is no such thing as a "safe" cigarette.

Lung cancer is one of the most dangerous cancers. Only 8% survive more than 5 years. If every adult had a chest x-ray with his regular physical exam, more lung cancer would be found early and treatment would be more successful.
CONCEPTS

After skin cancer, breast cancer is the most common site in women. It is highly curable if detected early. (See Training Manual for lesson plan for teaching BSE.)

ACTIVITIES

Discuss the incidence of breast cancer.
- What is the most effective method for detecting breast cancer early?
- What is the value of a yearly check-up for detecting breast cancer?

Regular self-examination of breasts is important in early detection of breast cancer.

Discuss the symptoms of breast cancer.
- What should a woman do who has detected a lump in the breast?
- Is breast cancer curable?

Invite a physician to class to discuss and demonstrate self-examination of the breast. Trained health educators are qualified to teach BSE also. (See Appendix XVI.)

The Pap Test is a means of early detection of cancer of the cervix.

Discuss: The location of the cervix.
- What is the Pap Test?
- What does the Pap Test show?
- Who should get a Pap Test?
- How effective is it?
- How often should a woman get a Pap Test?
(See ACS Pamphlet "Answering Your Questions About Cancer," "2025, and "Cancer of the Uterus", #2006.)

SUPPLEMENTARY INFORMATION

1 in 13 women will develop breast cancer. It can strike a woman of any age but is more frequently found in the over 35 age group.

There are 88,000 new cases each year and 33,000 deaths. Detected early, breast cancer is highly curable.

Every woman can assure early detection by regularly examining her own breasts and reporting abnormalities to a doctor.

The most common symptom of cancer is a lump in the breast. Most lumps are benign (harmless) but only a doctor can tell for sure. About 8 of 10 lumps found by women are benign. All lumps should be reported immediately to the doctor. Mammography is a form of x-ray used to detect breast cancer.

Breast cancer is treated by removal of the cancerous breast and adjacent lymph nodes through which cancer may be spread. At times pectoral muscles in the chest may also be removed. Treatment in individual cases is determined by the individual physician's best judgment.

The cervix, located inside the body, in the neck of the uterus or womb.

There will be approximately 11,000 deaths from uterine cancer this year. Women most at risk are those who begin sexual
CONCEPTS

Cancer of the colon and rectum is highly curable when detected early.

The best methods of detection of cancer of the colon and rectum is an annual physical checkup.

(See Training Manual for a discussion of "Cancer of the Colon and Rectum", and ACS "Cancer of the Colon and Rectum", #2004.)

ACTIVITIES

- Why is the incidence of cervical cancer relatively high?
- How complex is the procedure developed by Dr. Papanicolaou?
- Is it safe?

Discuss: The location and function of the colon and rectum.

Why is the death rate so high for cancer of the colon and rectum?

What simple procedure could help to reduce this rate?

SUPPLEMENTARY INFORMATION

relations at an early age and have several different partners during their life, however, it can appear in any woman.

The Pap Test is a simple, painless test done by a doctor which can detect cancer long before symptoms appear.

Most deaths from cervical cancer are unnecessary since it can be detected early enough and successfully treated.

The Pap Test, developed by Dr. George N. Papanicolaou, is a simple test wherein a doctor or a specially trained nurse gently scrapes the cervix to obtain a sample of tissue. This process takes only a minute and the woman usually feels nothing. When the body cells obtained in this manner are viewed microscopically, a pathologist can identify cancerous or precancerous states. This test should be done once a year.

There are approximately 100,000 cases of colon and rectum cancer every year and 49,000 deaths.

It is uncommon in people under 40 and incidence increases with age.

The best safeguard is an annual physical checkup including a proctoscopic examination (visual examination of the lower colon and rectum through a lighted tube), especially after age 40.
Leukemia is the most common cancer in children and teenagers. Leukemia also occurs in adults.

Research efforts are approaching new controls for leukemia.

Discuss incidence of leukemia
- specifically, what is leukemia?
- how is it detected? treated?
- can it be prevented?
- can it be cured or arrested?

Invite a speaker from a research facility to discuss current treatment of leukemia patients.

Have students prepare articles for the school newspaper on aspects of cancer detection and prevention relating to teenagers.

(See Training Manual - "Cancer of Thyroid, Pancreas, and Wilms' Tumor", and ACS Pamphlet "Leukemia", #2629).

VI. Cancer Research

Cancer research is divided into 3 main areas:

1) Fundamental research into the nature of the cell and cellular change.

2) New and better methods of treatment.

3) Improved methods of detection so that more cancers may be detected early when they are most curable.

(See Training Manual for discussion of "Cancer Research").

Leukemia is a cancer of the blood-forming tissues, resulting in over-production of immature white cells. Although the most common cancer in children, it actually strikes more adults. There will be 21,000 new cases and 15,000 deaths this year. Presently leukemia cannot be prevented.

Many scientists believe leukemia is caused by a virus and are hopeful of developing a cure and even a preventive vaccine.

Meanwhile, treatment with drugs (chemotherapy) has dramatically raised the longterm survival rate. (See Training Manual for discussion of "Cat Leukemia Virus").

New York State has two leading cancer research facilities -- Roswell Park Memorial Institute in Buffalo and Memorial Sloan-Kettering in New York City.

There are four chief methods used in the treatment of cancer. They are as follows:

**Surgery** is the physical removal of a tumor and tissue which may contain cancer cells.
CONCEPTS

There are several methods of treating cancer; some are more effective for certain kinds of cancer than others. (See Training Manual for a discussion of "Chemotherapy" and "Cancer Immunotherapy").

ACTIVITIES

Describe how each treatment method works.
- How does surgical removal of cancer differ from radiotherapy?
- What do all methods of treatment strive to do to the cancer cells? (See Training Manual - "Cancer Treatment").

Supplementary Information

Radiotherapy is the destruction of cancer cells with radiation. Some kinds of cancer are more susceptible to radiotherapy than others. Radiation sometimes has adverse side effects, such as nausea.

Chemotherapy is the use of drugs which interfere with the growth and mitosis of cancer cells. Such drugs also have an effect on healthy cells. Presently, chemotherapy extends life, but only cures a few forms of cancer.

Immunotherapy is the stimulation of the body's defense system to destroy cancer cells.

There is evidence that everyone has certain numbers of abnormal cells within their bodies, which are continually controlled by the natural immune system.

The worth of immunotherapy has been proven in the treatment of certain skin cancers. This form of treatment is still in its early stages of development.

The treatment of any serious disease is best handled by those reputable specialists associated with reputable hospitals and institutes. Unwarranted fear may lead people to seek assistance from quacks or "miracle workers". This is a mistake.

Cancer is usually diagnosed by biopsy, the removal of suspect cells with a knife or needle. A pathologist viewing


Invite a laryngectomee to speak to the group concerning cancer therapy and rehabilitation and smoking and health. The local unit of the ACS will assist in this effort.

Student reports on tools of research, e.g., electron microscope, linear accelerator, tissue culture, laboratory animals.
VII. Individual Responsibility in Cancer Control

As members of a community, each of us has a responsibility to maintain our own health and to promote the general well-being of other members.

Discuss the importance of good health habits in controlling cancer:
1) Regular checkups even though you feel well.
2) Learning to watch your body for changes which may be symptoms of cancer.
3) Preventing cancer by:
   a) not smoking
   b) avoiding excessive sunlight.
4) Supporting efforts to reduce environmental pollution and occupational exposure to pollution.
5) Becoming acquainted with and informing others about safeguards against cancer.

Show ACS film, "Signals", #2376

Appoint a student committee to develop a cancer information center, using resources such as ACS, Clearinghouse for Smoking and Health, etc.

The teacher may want to review the previous discussions regarding each of these areas related to prevention.
Have each student develop a plan of personal action as an individual contribution to cancer control.

Appoint a panel which will lead discussion of personal barriers to cancer control. What can be done to eliminate them?

Appoint a second panel which will lead discussion of social barriers to cancer control. What can be done to eliminate them?

See Safeguards Diagram in Appendix XIII.

7 Safeguards:

Don't smoke.
Avoid excessive sun.
Regular procto for those over 40.
Regular physical exam.
Regular dental exam.

For Women:
Monthly breast self-examination.
Annual Pap Test
(See ACS Pamphlets:
1) "Safegurads Against Cancer", #2060
2) "Safeguards Against Cancer", #2066
3) "Safeguards Against Cancer", #2073
(Spanish)
GLOSSARY

aflatoxin - a poison produced by the mold, aspergillus flavus, sometimes found in rotten corn and in spoiled ground nut seedlings. Carcinogenic activity proven. Responsible for death of farm animals consuming it. Cause of liver cancer in African natives using spoiled corn meal.

AHH - aryl hydrocarbon hydroxalase - a chemical, that if present in sufficient quantity in an individual may increase risk to lung cancer if she/he smokes.

alveoli - air sacs of the lungs.

benign - not cancerous.

biopsy - the removal and examination, usually microscopic of tissue or other materials from the living body for purposes of diagnosis.

bronchi - the two main branches of the trachea (windpipe).

cancer - a malignant tumor; a disease that involves uncontrolled reproduction of abnormal cells. If unchecked, the course of the disease is fatal.

carcinogen - a cancer-causing agent or substance.

cell - the smallest unit of living matter; a mass of protoplasm containing a nucleus, surrounded by a semi-permeable membrane.

cell differentiation - the process by which a cell develops uniqueness. It becomes specialized for use in a particular part of body or plant. (skin cell, bone cell, blood cell).

chemotherapy - treatment with chemicals or drugs, without producing serious side effects on the patient.

chromosomes - rod-shaped bodies in the nuclei of cells which contain hereditary material (genes).
chronic disease - one that continues over a long period of time.

cilia - hair-like projections from certain cells to protect them from injury. 
(example - trachea).

cytoplasm - the contents of the cell exclusive of the nucleus.

goblet cells - cells that secrete mucus in the air passages.

hydrocarbon - an organic compound that contains carbon and hydrogen only. Three types -
 cyclic, aliphatic and aromatic - according to arrangement of atoms and
chemical properties of compounds.

immunotherapy - treatment by the production of immunity. (anti-bodies)

infectious disease - one caused by parasites such as bacteria, protozoa, fungi, or viruses.

larynx - the voice box.

malignant - cancerous, life threatening.

mammography - diagnostic x-ray examination of the breasts.

mitosis - cell division resulting in formation of two new nuclei each having same number of
chromosomes as the parent nucleus.

nucleus - the central portion of the cell containing the heredity material (chromosomes). 
 Coordinates cell activities.

ozone layer - a gas found in an atmospheric layer at heights of approximately 20 to 30 miles
characterized by high ozone content.

plasma membrane - the membrane surrounding a cell; the superficial layer of the protoplasm
of a cell.
protoplasm - material of which cells are formed. Consists of water, protein, fats, carbohydrates and traces of other matter.

radiation - the giving off of radiant energy in the form of waves or particles, used in cancer therapy.

surgery - the removal of tissue or an organ.

tissue - a group of similar cells performing a particular function.

trachea - the windpipe.

tumor - an abnormal mass of tissue which has no physiologic use.

virus - a submicroscopic infectious agent. Viruses reproduce only in living cells and lack independent life processes.
DIAGRAM OF A TYPICAL CELL
APPENDIX 2

SOME EXAMPLES OF HUMAN CELLS

Nerve Cell

Muscle Cell

Top

Side

Two views of Red Blood Cell

Epithelial Cells

Elena Greco
APPENDIX 3

CELL DIVISION – MITOSIS

A. NUCLEAR ACTIVITY (CHROMATIN MATRIX)
B. CHROMOSOME AGGREGATION AND REPLICATION
C. CHROMOSOME SEPARATION
D. NUCLEAR FORMATION
E. CELL MEMBRANE ESTABLISHED
F. CELL SEPARATION

THIS DIVISION IS NORMAL BECAUSE:
1) CHROMOSOMES REPLICATE AND MIGRATE TO OPPOSITE ENDS OF THE CELL
2) TWO NUCLEI ARE FORMED
3) THE NUCLEI ARE SMALL AND STAIN LIGHTLY
4) TWO SIMILAR CELLS ARE PRODUCED
AN EXAMPLE OF ABNORMAL CELL DIVISION

A. ACTIVITY IN NUCLEUS (ABNORMAL)
B. CHROMOSOME AGGREGATION AND REPPLICATION
C. ABNORMAL SEPARATION INTO THREE AREAS (TRIPOLAR MITOSIS)
D. THREE NUCLEI FORM
E. ABNORMAL NUCLEAR SEPARATION
F. SEPARATION INTO ABNORMAL CELLS

THIS DIVISION IS ABNORMAL BECAUSE:
1) THREE REPlications OF CHROMOSOMES INSTEAD OF TWO (B)
2) THREE NUCLEI ARE FORMED (INSTEAD OF TWO NORMAL NUCLEI)
3) THE NUCLEI ARE GENERALLY LARGER AND STAIN DARKER
4) ABNORMAL CELLS ARE PRODUCED (F)
A. NORMAL TISSUE
B. ABNORMAL CELL APPEARS
C. GROWTH OF ABNORMAL TISSUE
D. CONTINUED GROWTH OF TUMOR, INVADING ADJACENT AREAS
E. METASTASIS THROUGH NEARBY BLOOD VESSEL (CAPILLARY)

MALE
- Lung and Bronchus
- Prostate
- Colon and Rectum
- Bladder
- Stomach
- Total Leukemia
- Pancreas
- Lymphoma (including Hodgkin's Disease)
- Larynx
- Kidney

FEMALE
- Breast
- Colon and Rectum
- Cervix (in-situ)
- Corpus Uteri
- Cervix (invasive)
- Lung and Bronchus
- Ovary
- Lymphoma (including Hodgkin's Disease)
- Pancreas
- Total Leukemia

NUMBER OF CASES PER 100,000 POPULATION

0 10 20 30 40 50 60 70 80
TIME TRENDS IN CANC
United States, 1930-1970

RATE PER 100,000 POPULATION

1930 1940

10 20 30 40 50
DEATH RATES FOR THE 11 LEADING CAUSES OF DEATH:
United States, 1970

DEATH RATE / 100,000

0 100 200 300 400

Diseases of the Heart
CANCER
Cerebrovascular Disease
Accidents
Influenza and Pneumonia
Certain Causes of Mortality in Early Infancy
Diabetes Mellitus
Arteriosclerosis
Cirrhosis of Liver
Bronchitis, Emphysema, and Asthma
Suicide
### Mortality for Leading Causes of Death: United States, 1971

<table>
<thead>
<tr>
<th>Rank</th>
<th>Cause of Death</th>
<th>Number of Deaths</th>
<th>Death Rate Per 100,000 Population</th>
<th>Percent of Total Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Diseases of Heart</td>
<td>743,138</td>
<td>359.5</td>
<td>36.6</td>
</tr>
<tr>
<td>2</td>
<td>Cancer</td>
<td>387,399</td>
<td>163.2</td>
<td>17.5</td>
</tr>
<tr>
<td>3</td>
<td>Stroke</td>
<td>299,062</td>
<td>101.1</td>
<td>10.6</td>
</tr>
<tr>
<td>4</td>
<td>Accident</td>
<td>113,439</td>
<td>54.9</td>
<td>5.9</td>
</tr>
<tr>
<td>5</td>
<td>Illness &amp; Pneumonia</td>
<td>57,194</td>
<td>27.7</td>
<td>2.9</td>
</tr>
<tr>
<td>6</td>
<td>Certain Diseases of Infancy</td>
<td>38,494</td>
<td>18.8</td>
<td>2.0</td>
</tr>
<tr>
<td>7</td>
<td>Diabetes Mellitus</td>
<td>36,268</td>
<td>16.8</td>
<td>2.0</td>
</tr>
<tr>
<td>8</td>
<td>Causes of Liver</td>
<td>31,808</td>
<td>15.4</td>
<td>1.7</td>
</tr>
</tbody>
</table>

**Total**: 1,927,542, 932.2, 100.

**Source**: Vital Statistics of the United States, 1971
Prepared by: Research Department, American Cancer Society, July, 1974

### Applying Cancer Statistics Locally

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1,000</td>
<td>7</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>250</td>
<td>150</td>
</tr>
<tr>
<td>2,000</td>
<td>15</td>
<td>9</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>500</td>
<td>300</td>
</tr>
<tr>
<td>3,000</td>
<td>22</td>
<td>13</td>
<td>4</td>
<td>8</td>
<td>3</td>
<td>750</td>
<td>450</td>
</tr>
<tr>
<td>4,000</td>
<td>30</td>
<td>18</td>
<td>6</td>
<td>11</td>
<td>4</td>
<td>1,000</td>
<td>600</td>
</tr>
<tr>
<td>5,000</td>
<td>37</td>
<td>21</td>
<td>7</td>
<td>14</td>
<td>5</td>
<td>1,250</td>
<td>750</td>
</tr>
<tr>
<td>10,000</td>
<td>74</td>
<td>43</td>
<td>15</td>
<td>28</td>
<td>9</td>
<td>2,500</td>
<td>1,500</td>
</tr>
<tr>
<td>25,000</td>
<td>165</td>
<td>107</td>
<td>37</td>
<td>70</td>
<td>23</td>
<td>6,250</td>
<td>3,750</td>
</tr>
<tr>
<td>50,000</td>
<td>370</td>
<td>215</td>
<td>75</td>
<td>140</td>
<td>47</td>
<td>12,500</td>
<td>7,500</td>
</tr>
<tr>
<td>100,000</td>
<td>740</td>
<td>430</td>
<td>150</td>
<td>280</td>
<td>93</td>
<td>25,000</td>
<td>15,000</td>
</tr>
<tr>
<td>200,000</td>
<td>1,480</td>
<td>860</td>
<td>300</td>
<td>560</td>
<td>188</td>
<td>50,000</td>
<td>30,000</td>
</tr>
<tr>
<td>500,000</td>
<td>3,700</td>
<td>2,160</td>
<td>750</td>
<td>1,400</td>
<td>465</td>
<td>125,000</td>
<td>75,000</td>
</tr>
</tbody>
</table>

**Note**: The figures can only be the roughest approximation of actual data for your community. It is suggested that every effort be made to obtain actual data from a Registry source.

---

**APPENDIX 9**

American Cancer Society "1976 Cancer Facts and Figures" #5008
INCREASE IN CIGARETTE SALES
AND LUNG CANCER 1900-1975

BILLION CIGARETTES


LUNG CANCER

81,000
40,000
5,000

CIGARETTE SALES

Surgeon General's Report

Beginning of Health Warnings

Advent of Modern Advertising

W.W.I

W.W.II

E.R.I.C.
## ESTIMATED NEW CASES AND DEATHS FOR MAJOR SITES OF CANCER – 1975

<table>
<thead>
<tr>
<th>Site</th>
<th>No. of Cases</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung</td>
<td>91,000</td>
<td>81,000</td>
</tr>
<tr>
<td>Colon-Rectum</td>
<td>99,000</td>
<td>49,000</td>
</tr>
<tr>
<td>Breast</td>
<td>89,000</td>
<td>33,000</td>
</tr>
<tr>
<td>Uterus</td>
<td>46,000**</td>
<td>11,000</td>
</tr>
<tr>
<td>Oral</td>
<td>23,000</td>
<td>8,000</td>
</tr>
<tr>
<td>Skin</td>
<td>9,000***</td>
<td>5,000</td>
</tr>
<tr>
<td>Leukemia</td>
<td>21,000</td>
<td>15,000</td>
</tr>
</tbody>
</table>

*Figures rounded to the nearest 1000.

**If carcinoma-in-situ included, cases total over 86,000.

***Estimates vary widely, from 300,000-600,000 or more, for superficial skin cancer.

INCIDENCE RATES ARE BASED ON RATES FROM N.C.I. THIRD NATIONAL CANCER SURVEY

## FIVE YEAR CANCER SURVIVAL RATES FOR SELECTED SITES

*Excluding superficial skin cancer and carcinoma-in-situ of uterine cervix.
## LEADING CANCER SITES, 1974

<table>
<thead>
<tr>
<th>SITE</th>
<th>ESTIMATED NEW CASES 1974</th>
<th>ESTIMATED DEATHS 1974</th>
<th>WARNING SIGNAL IF YOU HAVE ONE, SEE YOUR DOCTOR</th>
<th>SAFEGUARDS</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>BREAST</td>
<td>90,000</td>
<td>33,000</td>
<td>LUMP OR THICKENING IN THE BREAST.</td>
<td>ANNUAL CHECKUP, MONTHLY BREAST SELF EXAM.</td>
<td>THE LEADING CAUSE OF CANCER DEATH IN WOMEN.</td>
</tr>
<tr>
<td>COLON AND RECTUM</td>
<td>99,000</td>
<td>48,000</td>
<td>CHANGE IN BOWEL HABITS; BLEEDING.</td>
<td>ANNUAL CHECKUP INCLUDING PROCTOSCOPY, ESPECIALLY FOR THOSE OVER 40,</td>
<td>CONSIDERED A HIGHLY CURABLE DISEASE WHEN DIGITAL AND PROCTOSCOPIC EXAMINATIONS ARE INCLUDED IN ROUTINE CHECKUPS.</td>
</tr>
<tr>
<td>LUNG</td>
<td>83,000</td>
<td>75,000</td>
<td>PERSISTENT COUGH, OR LINGERING RESPIRATORY AILMENT.</td>
<td>PREVENTION: HEED FACTS ABOUT SMOKING, ANNUAL CHECKUP, CHEST X-RAY.</td>
<td>THE LEADING CAUSE OF CANCER DEATH AMONG MEN. THIS FORM OF CANCER IS LARGELY PREVENTABLE.</td>
</tr>
<tr>
<td>ORAL (INCLUDING PHARYNX)</td>
<td>24,000</td>
<td>8,000</td>
<td>SORE THAT DOES NOT HEAL, DIFFICULTY IN SWALLOWING.</td>
<td>ANNUAL CHECKUP.</td>
<td>MANY MORE LIVES SHOULD BE SAVED BECAUSE THE MOUTH IS EASILY ACCESSIBLE TO VISUAL EXAMINATION BY PHYSICIANS AND DENTISTS.</td>
</tr>
<tr>
<td>SKIN</td>
<td>300,000*</td>
<td>5,000</td>
<td>SORE THAT DOES NOT HEAL, OR CHANGE IN WART OR MOLE.</td>
<td>ANNUAL CHECKUP, AVOIDANCE OF OVEREXPOSURE TO SUN.</td>
<td>SKIN CANCER IS READILY DETECTED BY OBSERVATION, AND DIAGNOSED BY SIMPLE BIOPSY.</td>
</tr>
<tr>
<td>UTERUS</td>
<td>46,000*</td>
<td>11,000</td>
<td>UNUSUAL BLEEDING OR DISCHARGE.</td>
<td>ANNUAL CHECKUP, INCLUDING PELVIC EXAMINATION WITH PAP TEST.</td>
<td>UTERINE CANCER MORTALITY HAS DECLINED 65% DURING THE LAST 35 YEARS, WITH WIDER APPLICATION OF THE PAP TEST, MANY MORE LIVES CAN BE SAVED, ESPECIALLY FROM CERVICAL CANCER.</td>
</tr>
<tr>
<td>KIDNEY AND BLADDER</td>
<td>43,000</td>
<td>16,000</td>
<td>URINARY DIFFICULTY, BLEEDING--IN WHICH CASE CONSULT DOCTOR AT ONCE.</td>
<td>ANNUAL CHECKUP WITH URINALYSIS.</td>
<td>PROTECTIVE MEASURES FOR WORKERS IN HIGH-RISK INDUSTRIES ARE HELPING TO ELIMINATE ONE OF THE IMPORTANT CAUSES OF THESE CANCERS.</td>
</tr>
<tr>
<td>LARYNX</td>
<td>10,000</td>
<td>3,000</td>
<td>HOARSENESS--DIFFICULTY IN SWALLOWING.</td>
<td>ANNUAL CHECKUP, INCLUDING MIRROR LARYNGOSCOPY.</td>
<td>READILY CURABLE IF CAUGHT EARLY.</td>
</tr>
<tr>
<td>PROSTATE</td>
<td>54,000</td>
<td>18,000</td>
<td>URINARY DIFFICULTY.</td>
<td>ANNUAL CHECKUP, INCLUDING PALPATION.</td>
<td>OCCURS MAINLY IN MEN OVER 60, THE DISEASE CAN BE DETECTED BY PALPATION AND URINALYSIS AT ANNUAL CHECKUP.</td>
</tr>
<tr>
<td>STOMACH</td>
<td>23,000</td>
<td>14,000</td>
<td>INDIGESTION.</td>
<td>ANNUAL CHECKUP.</td>
<td>A 40% DECLINE IN MORTALITY IN 20 YEARS, FOR REASONS YET UNKNOWN.</td>
</tr>
<tr>
<td>LEUKEMIA</td>
<td>21,000</td>
<td>15,000</td>
<td>LEUKEMIA IS A CANCER OF BLOOD-FORMING TISSUES AND IS CHARACTERIZED BY THE ABNORMAL PRODUCTION OF IMMATURE WHITE BLOOD CELLS. ACUTE LEUKEMIA STRIKES MAINLY CHILDREN AND IS TREATED BY DRUGS WHICH HAVE EXTENDED LIFE FROM A FEW MONTHS TO AS MUCH AS TEN YEARS. CHRONIC LEUKEMIA STRIKES USUALLY AFTER AGE 25 AND PROGRESSES LESS RAPIDLY.</td>
<td>IF DRUGS OR VACCINES ARE FOUND WHICH CAN CURE OR PREVENT ANY CANCERS THEY PROBABLY WILL BE SUCCESSFUL FIRST FOR LEUKEMIA AND THE LYMPHOMAS.</td>
<td></td>
</tr>
<tr>
<td>LYMPHOMAS</td>
<td>28,000</td>
<td>20,000</td>
<td>THESE DISEASES ARISE IN THE LYMPH SYSTEM AND INCLUDE HODGKIN'S AND LYMPHOSARCOMA. SOME PATIENTS WITH LYMPHATIC CANCERS CAN LEAD NORMAL LIVES FOR MANY YEARS.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Carcinoma-in-situ of the uterine cervix and superficial skin cancers not included in totals.*

---

American Cancer Society "Nature of Cancer "Senior High School Teaching Kit, Lesson 7, #2054.02
CANCER PREVENTION AND CONTROL

Cancer’s Warning Signals!
1. Change in bowel or bladder habits.
2. A sore that does not heal.
3. Unusual bleeding or discharge.
4. Thickening or lump in breast or elsewhere.
5. Indigestion, or difficulty in swallowing.
6. Obvious change in wart or mole.
7. Nagging cough or hoarseness.

If you have a warning signal, see your doctor.

Protect Yourself With These Safeguards Against CANCER

<table>
<thead>
<tr>
<th>Body Part</th>
<th>Preventative Measures</th>
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</thead>
<tbody>
<tr>
<td>BREAST</td>
<td>Monthly Self-Exam</td>
</tr>
<tr>
<td>UTERUS</td>
<td>Pap Test Once a Year</td>
</tr>
<tr>
<td>LUNG</td>
<td>Don’t Smoke Cigarettes</td>
</tr>
<tr>
<td>SKIN</td>
<td>Avoid Excess Sun</td>
</tr>
<tr>
<td>COLON</td>
<td>Procto Annually</td>
</tr>
<tr>
<td>RECTUM</td>
<td>Especially After 40</td>
</tr>
<tr>
<td>MOUTH</td>
<td>Exams Regularly</td>
</tr>
</tbody>
</table>

American Cancer Society "Nature of Cancer" Senior High Teaching Kit, Lesson 8, #2054.02
## APPENDIX 14

### TRENDS IN AGE-ADJUSTED CANCER DEATH RATES

Per 100,000 Population 1952-54 to Recent

<table>
<thead>
<tr>
<th>Sex</th>
<th>Site</th>
<th>1952-54</th>
<th>Recent</th>
<th>Percent Changes</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>All Sites</td>
<td>136.0</td>
<td>155.1</td>
<td>+ 14</td>
<td>Steady increase mainly due to lung cancer.</td>
</tr>
<tr>
<td>Female</td>
<td>All Sites</td>
<td>118.5</td>
<td>109.6</td>
<td>- 8</td>
<td>Slight decrease.</td>
</tr>
<tr>
<td>Male</td>
<td>Breast</td>
<td>0.2</td>
<td>0.2</td>
<td>-</td>
<td>Constant rate.</td>
</tr>
<tr>
<td>Female</td>
<td>Breast</td>
<td>21.8</td>
<td>22.9</td>
<td>+ 5</td>
<td>Slight fluctuations: Overall no change.</td>
</tr>
<tr>
<td>Male</td>
<td>Colon &amp; Rectum</td>
<td>19.3</td>
<td>18.8</td>
<td>- 3</td>
<td>Slight decrease in both sexes.</td>
</tr>
<tr>
<td>Female</td>
<td>Colon &amp; Rectum</td>
<td>18.0</td>
<td>15.8</td>
<td>- 12</td>
<td>Slight decrease in both sexes.</td>
</tr>
<tr>
<td>Male</td>
<td>Lung</td>
<td>22.7</td>
<td>44.5</td>
<td>+ 96</td>
<td>Steady increase in both sexes due to cigarette smoking.</td>
</tr>
<tr>
<td>Female</td>
<td>Lung</td>
<td>4.0</td>
<td>8.1</td>
<td>+ 103</td>
<td>Steady increase in both sexes due to cigarette smoking.</td>
</tr>
<tr>
<td>Male</td>
<td>Oral</td>
<td>4.6</td>
<td>4.9</td>
<td>+ 7</td>
<td>Slight fluctuations: Overall no change in both sexes.</td>
</tr>
<tr>
<td>Female</td>
<td>Oral</td>
<td>1.4</td>
<td>1.4</td>
<td>-</td>
<td>Slight fluctuations: Overall no change in both sexes.</td>
</tr>
<tr>
<td>Male</td>
<td>Skin</td>
<td>2.4</td>
<td>2.5</td>
<td>+ 4</td>
<td>Slight fluctuations: Overall no change in both sexes.</td>
</tr>
<tr>
<td>Female</td>
<td>Skin</td>
<td>1.5</td>
<td>1.5</td>
<td>-</td>
<td>Slight fluctuations: Overall no change in both sexes.</td>
</tr>
<tr>
<td>Female</td>
<td>Uterus</td>
<td>17.2</td>
<td>10.6</td>
<td>- 38</td>
<td>Steady decrease attributed in part to widening acceptance of regular checkup with &quot;Pap Test&quot;.</td>
</tr>
<tr>
<td>Male</td>
<td>Esophagus</td>
<td>3.8</td>
<td>4.1</td>
<td>+ 8</td>
<td>Slight fluctuations: Overall no change in both sexes.</td>
</tr>
<tr>
<td>Female</td>
<td>Esophagus</td>
<td>1.1</td>
<td>1.1</td>
<td>-</td>
<td>Slight fluctuations: Overall no change in both sexes.</td>
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<tr>
<td>Male</td>
<td>Stomach</td>
<td>16.9</td>
<td>9.1</td>
<td>- 46</td>
<td>Steady decrease in both sexes: Reasons unknown.</td>
</tr>
<tr>
<td>Female</td>
<td>Stomach</td>
<td>8.7</td>
<td>4.5</td>
<td>- 48</td>
<td>Steady decrease in both sexes: Reasons unknown.</td>
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<tr>
<td>Male</td>
<td>Prostate</td>
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<td>13.5</td>
<td>- 4</td>
<td>Early increase, later decrease, again increasing.</td>
</tr>
<tr>
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<td>Ovary</td>
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<td>+ 6</td>
<td>Steady increase.</td>
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<td>Male</td>
<td>Kidney</td>
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<td>+ 21</td>
<td>Steady slight increase.</td>
</tr>
<tr>
<td>Female</td>
<td>Kidney</td>
<td>1.7</td>
<td>1.7</td>
<td>-</td>
<td>Slight fluctuations: Overall no change.</td>
</tr>
<tr>
<td>Male</td>
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<td>6.8</td>
<td>7.3</td>
<td>+ 7</td>
<td>Early increase, later leveling off.</td>
</tr>
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<td>Leukemia</td>
<td>4.7</td>
<td>4.6</td>
<td>- 2</td>
<td>Slight early increase, later leveling off.</td>
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</table>

Comments:

- Early increase, later leveling off:
- Steady increase:
- Steady slight increase:
- Early increase, later decrease, again increasing:
- Slight decrease in both sexes:
- Slight fluctuations:
- Overall no change:
- Constant rate:
- Steady increase in both sexes:
- Steady increase due to cigarette smoking:
- Steady increase in both sexes: Reasons unknown:
- Steady decrease attributed in part to widening acceptance of regular checkup with "Pap Test".

American Cancer Society "Nature of Cancer" Teaching Kit, Lesson 7, #2054.02
## APPENDIX 15

### CANCER AROUND THE WORLD

<table>
<thead>
<tr>
<th>Country</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
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<td>18.9</td>
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<td>17.0</td>
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<td>26.3</td>
<td>20.5</td>
<td>19.8</td>
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<td>21.6</td>
<td>18.4</td>
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<tr>
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<td>17.9</td>
<td>17.0</td>
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<td>17.2</td>
<td>17.9</td>
<td>17.7</td>
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<td>17.2</td>
<td>17.9</td>
<td>17.7</td>
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<tr>
<td>Panama</td>
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<td>17.2</td>
<td>17.9</td>
<td>17.7</td>
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<tr>
<td>Poland</td>
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<td>22.5</td>
<td>18.7</td>
<td>17.7</td>
</tr>
<tr>
<td>Portugal</td>
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<td>22.5</td>
<td>18.7</td>
<td>17.7</td>
</tr>
<tr>
<td>Rumania</td>
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<td>22.5</td>
<td>18.7</td>
<td>17.7</td>
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<tr>
<td>Scotland</td>
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<td>18.7</td>
<td>17.7</td>
</tr>
<tr>
<td>South Africa</td>
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<td>22.5</td>
<td>18.7</td>
<td>17.7</td>
</tr>
<tr>
<td>Sweden</td>
<td>23.4</td>
<td>22.5</td>
<td>18.7</td>
<td>17.7</td>
</tr>
<tr>
<td>Switzerland</td>
<td>23.4</td>
<td>22.5</td>
<td>18.7</td>
<td>17.7</td>
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<tr>
<td>Ukraine</td>
<td>23.4</td>
<td>22.5</td>
<td>18.7</td>
<td>17.7</td>
</tr>
</tbody>
</table>

### NOTE: Figures in parentheses are order of rank within site and sex group. Source: World Health Statistics Annual 1966-67
How to examine your breasts

In the shower:
Examine your breasts during bath or shower; hands glide easier over wet skin. Fingers flat, move gently over even, part of each breast. Use right hand to examine left breast, left hand for right breast. Check for any lump, hard knot or thickening.

Before a mirror:
Inspect your breasts with arms at your sides. Next, raise your arms high overhead. Look for any changes in contour of each breast, a swelling, dimpling of skin or changes in the nipple. Then, rest palms on hips and press down firmly to flex your chest muscles. Left and right breast will not exactly match; few women’s breasts do. Regular inspection shows what is normal for you and will give you confidence in your examination.

Lying down:
To examine your right breast, put a pillow or folded towel under your right shoulder. Place right hand behind your head—this distributes breast tissue more evenly on the chest. With left hand, fingers flat, press gently in small circular motions around an imaginary clock face. Pinch at outermost top of your right breast for 12 o’clock, then move to 1 o’clock and so on around the circle back to 12. A ridge of firm tissue in the lower curve of each breast is normal. Then move in an inch, toward the nipple, keep circling to examine every part of your breast, including nipple. This requires at least three more circles. Now slowly repeat procedure on your left breast with a pillow under your left shoulder and left hand behind head. Notice how your breast structure feels.

Finally, squeeze the nipple of each breast gently between thumb and index finger. Any discharge, clear or bloody, should be reported to your doctor immediately.
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Outside Erie County
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1-800-462-1884
Monday-Sunday
8 a.m. - 12 mid.

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concerning cancer. Now you can listen to answers to some
of the commonly asked questions on cancer in the privacy
of your home or office. This toll-free service is available
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6725 LYONS ST., P.O. BOX 7, SYRACUSE, N.Y. 13057

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3. Cancer of the Breast—And How to Detect It.
4. Lung Cancer.
5. If You Want To Give Up Cigarettes.
7. Cancer of the Uterus.
8. Cancer of the Skin.
10. Leukemia.
11. Cancer of the Mouth.
12. Service and Rehabilitation Information—Cancer Patients and Their Families.
15. Cancer of the Prostate.
22. What Is the Pap Test—How Can It Help You?
23. What is the Roswell Park Memorial Institute?
24. Radiation Therapy in Cancer Treatment.
25. Words from a Hospital Chaplain.
26. The Effect of Cigarette Smoking on the Non-Smoker.
29. Questions and Answers About Smoking and Quitting.
30. Cancer Facts for the Teenager and the Young Adult.
32. Questions and Answers About Smoking and Health.
33. Cancer of the Thyroid Gland.
34. Speech Therapy After Cancer Treatment.
35. Cancer Facts for the Senior Citizen.
36. The Economic Impact of Cancer on the Family.

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