

# **PREVENTION OF CANCER**

( A booklet for the lay public )

~~Rs. 5-00~~



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BY

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## FOREWORD

"Prevention is better than Cure". This is applicable to all diseases and equally if not more, so to Cancer. The Northern Province Cancer Society, realising the need for educating the public in prevention and also early recognition of cancer, has already published a booklet, in Tamil, on "prevention of cancer", written by Dr. V. Krishnarajah, who has also written a booklet on "Health Hints", in Tamil, for the lay public. He has now written this booklet in English, for the benefit of many others, not proficient in Tamil. We welcome this move and hope that many will be benefited.

I take this opportunity to appeal to the generous public to help build a Cancer Home for Incurables. A land has already been donated (by Mr. Thambirajah of Oorelu) and the building is expected to cost 30 lakhs and will house 25 to 30 inmates. Donations may be sent to our Treasurer, Mr. E. Seevaratnam, Attorney at Law, 32, 4th Cross street Jaffna. Our Society has been registered as a charitable organisation and your donation is exempt from Income Tax.

**Dr. M. Jeganathan,**

**President, Northern Province Cancer Society  
and Deputy, R. D. H. S., Jaffna.**

24th February 1986

## PREFACE

Cancer is one of the three foremost killers (the others being Heart Disease and Accidents). To the lay public, Cancer is a dreadful disease. Even to many medical men this is so. Unfortunately what the public (at least many of them) do not realise is that many forms of cancer could be prevented and even if they do occur, many of them could be successfully treated, if only they are detected early. Early detection necessitates a knowledge of the "Early warning symptoms and Signs" of the various forms of cancer. It is with these aspects in mind that this book is written. In order that the public may appreciate the nature and "causes" so as to correlate them with their relevance to prevention and early recognition, I have written the first two chapters, but the public is well advised to concentrate on the last two chapters.

I must hasten to add that, it is not everyone who is exposed to the factors mentioned, who ends up with cancer. The occurrence or more aptly the risk of occurrence depends on many factors such as, the individual predisposition (not seen in all), the length of exposure, severity of exposure, etc., as explained, and it is not the intention in this booklet to make you avoid everything in life, and lead a hermit's life! Perhaps the solution is in the exposure or subjection to the least possible "quantity" over the least possible time.

Nallur,  
24th February 1986.

**Dr. V. Krishnarajah**



## 1. WHAT IS CANCER?

What is cancer?. To understand this, let us briefly look at the structure of the body,

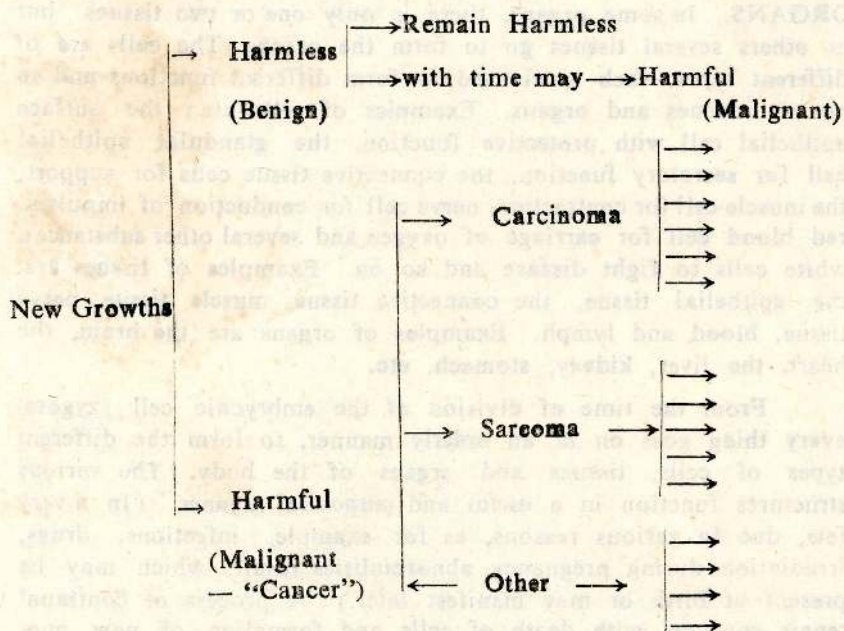
The basic component (the brick of the building) is the CELL. Many cells cemented together by what is called, inter-cellular substance form what are called TISSUES. In some tissues the cells are themselves connected together, across the intercellular substance by their processes. Tissues are arranged together to form ORGANS. In some organs, there is only one or two tissues but in others several tissues go to form the organ. The cells are of different types, each specialised to form different functions and so are the tissues and organs. Examples of cells are; the surface epithelial cell with protective function, the glandular epithelial cell for secretory function, the connective tissue cells for support, the muscle cell for contraction, nerve cell for conduction of impulses, red blood cell for carriage of oxygen and several other substances, white cells to fight disease and so on. Examples of tissues are; the epithelial tissue, the connective tissue, muscle tissue, nerve tissue, blood and lymph. Examples of organs are the brain, the heart, the liver, kidney, stomach, etc.

From the time of division of the embryonic cell (zygote) every thing goes on in an orderly manner, to form the different types of cells, tissues and organs of the body. The various structures function in a useful and purposeful manner. (In a very few, due to various reasons, as for example, infections, drugs, irradiation during pregnancy, abnormalities result, which may be present at birth or may manifest later.) A process of continual repair goes on, with death of cells and formation of new ones (except nerve cells.).

In some, due to various reasons that will be discussed in a subsequent chapter, aberrations in cell division and growth take place, with the formation of "New Growths". In some, the shape, size and even arrangement of the cells remain almost the same as in the normal tissue and they do not cause harm, except by pressure and are called the Benign Growth. (Some, of these in the course of time may turn "Malignant".) In others, the cells grow in a haphazard manner, with different sizes and shapes, and begin to invade adjacent structures and later spread to distant

parts of the body, with all these (purposeless) changes, disorganizing the functions of the body, thereby causing harm. These growths are called "Malignant Growth" or **CANCER**.

**Cancer** is of different types depending on the cell or cells from which it arises, and are accordingly given different names; Eg. Those arising from epithelial cells are called **CARCINOMAS** and those arising from connective tissue cells, the **SARCOMAS**.



Each variety in turn, consists of different types, depending on the particular type of epithelial cell or type of connective tissue cell, from which it arises; Eg Squamous carcinoma of, skin, cheek, oesophagus, from surface epithelial cell of these structures; Adenocarcinoma of Stomach, Pancreas, Liver; Transitional cell Carcinoma of Bladder; Osteosarcoma, Lymphosarcoma, Fibrosarcoma from bone, lymphoid tissue, fibrous tissue; Leukaemia from white Blood Cells. This is not a complete list of very many more types of Cancer that occur in the body.



From the site of its origin, cancer spreads as it grows, It can not only spread to adjacent tissues but also to distant sites, through blood vessels and lymphatics and some by the cells dropping across body cavities. Usually the spread occurs to adjacent lymph nodes, lungs, liver, bone and even brain.

Cancer produces its damage in many ways:- Many (but not all) cause general illhealth, wasting and anaemia by many mechanisms, some of which are loss of appetite resulting in less food intake; infection, malabsorption, circulating harmful substances from the growth etc. Also depending on the site or organ affected some specific effects would result; Eg Cancer of oesophagus causing difficulty in swallowing food, Cancer of Large bowel, difficulty in evacuation of faeces and bleeding; cancer of kidney, inability to excrete waste products fully, cancer of brain, headache, paralysis, loss of vision, etc. Some as they spread may "eat" into blood vessels and nerves causing bleeding and severe pain. Some produce hormones, which exert their specific actions. Spread into distant sites derange the function of the respective organs such as lungs, liver, bone, brain.

The severity of damage caused by cancer depends on many factors and varies from cancer to cancer and from person to person with the same type of cancer. Chief among these factors are the type of cell from which it arises, the degree of abnormality in size and shape of the cells, the rate of growth, the site or organ from which it arises and the extent of spread to other parts of the body. For example; Sarcomas arising usually in the young are more rapidly growing, spread distantly much more easily and cause more damage than the carcinomas. Of the carcinomas some are more damaging than the others; For example the liver cell carcinoma more than the breast, the pigmented variety of skin cancer more than the nonpigmented and the proliferating type of cancer of stomach more than the schirrous type, and those that have spread away from its site of origin more than those confined to its site, the same type in one person, more damaging in another person.

It should be clear now that cancers are of various types causing varying effects in various individuals.

## 2. FACTORS INFLUENCING FORMATION OF CANCER

To be able to prevent cancer, it is necessary to know what causes it. Unfortunately, what the root cause at the cellular level is still not clear, but several factors, involved in the causation of many cancers have been recognised. These factors may be explained under (a) General Factors common to many cancers and (b) Specific factors involved in particular site or sites.

### A. General Factors:

#### (a) Genetic

Genetic Factor is NOT concerned in the causation of Cancer except in few very rare instances (Xeroderma pigmentosa, naevoid basal cell carcinoma, polyposis coli and in those with some chromosomal abnormalities, (all of which are very rare). Some may have a predisposition, and some other factor may induce the formation of cancer. The public need not worry that just because one in the family developed cancer, the others in the family or their next generation will get cancer.

#### (b) Virus.

Though viruses have been shown to cause cancer in animals, in the Humans, only very few types are believed to be involved, particularly, the Hepatitis B virus, the Epstein Barr virus. Liver cancer, Cancer of Nasopharynx, "Hodgkins cancer", Lymphoma may result.

#### (c) Hormones

Only some cancers (that of breast, prostate and body of uterus) may occur in some only.

#### (d) Stress

Mental stress ~~acting through hormones liberated~~ has been implicated, ~~but more evidence is necessary to be sure of its connection~~ *now available.*

#### (e) Carcinogenic Agents.

Extrinsic Physical and Chemical Agents:

These can cause cancer by either contact or ingestion or inhalation and usually occurs in those pursuing certain occupations. It does not however occur in all and its occurrence will depend on



the degree, severity and length of exposure and even the predilection of certain individuals. A list of the more common agents, wherever known, the occupation involved and the site of formation is given below, to serve as examples and also that it may help those pursuing certain occupations to take appropriate measures.

### Physical Agents

Agent	Occupation	Site
Ionising Radiations	Luminous & Radium Dial Medical — Therapy — Laboratory Construction Industry Mining Radium	Bone Skin, White cells, C. N. S., Breast, Thyroid, Large Bowel.
Ultraviolet Radiation	Natural (Sunlight) Medical — Therapy	Skin
Thermal	Pipe smoking	Lip, Oral Cavity

### Chemical Agents.

Soot, Coal Tar, Mineral oils.	Mining	Lung, Skin, Bladder
Aromatic Amines	Synthesis of Dyes Textile Manufacture	Bladder
Hot Tar fumes, As- bestos, Chrome & Nickel Ore	Mining, Manufacture	Lung
Pesticides ? ?	Agriculture, Manufacture Wood furniture makers Leather makers	Nasal Sinuses
Isopropylene, Nickel, Ore	Mining, Manufacture	
Polyvinyl chloride (PVC)	Manufacture	Liver
Alkylating Agents	Manufacture	Lung, Larynx Nasal Sinuses



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Aflatoxin from fungus <i>Aspergillus flavus</i>	Liver
contaminating foodstuffs, eg palmyrah flour, roots, peanuts	
Cycasin from <i>Cycas circinalis</i> (tree in Far East)	

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(f) Chronic diseases.

Certain chronic conditions like chronic ulcers, (eg. skin stomach) and stones (eg. kidney, gall bladder), can lead to cancer.

Some deficiency diseases, like anaemia due to iron deficiency and cirrhosis of liver, can lead to cancer of the upper gastrointestinal tract and liver respectively.

Some harmless lesions like papilloma (a growth of the epithelium and leukoplakia (a white, dried paint like lesion in oral cavity or penis) may in the course of time turn cancerous.

**B. Specific factors that influence formation of Cancer**

Some factors, particularly Extrinsic carcinogens mentioned under General Factors as a group, are specific to certain sites and will not be mentioned again.

(a) DIET.

(i) Nutritional Deficiencies, particularly iron and Vitamin A may increase the risk of developing cancer in oral cavity, oesophagus and stomach.

(ii) Very high intake of fat, particularly animal fat and Protein can increase the risk for Cancer of Large Bowel, Body of Uterus, Breast and Kidney. This however DOES NOT APPLY to our country, except in the affluent classes.

(iii) Low fibre diet increases the risk for large bowel cancer but again does not apply to our country.

(iv) Excess coffee drinking perhaps with associated smoking could increase the risk for cancer of Pancreas, Bladder and Kidney.

(v) Aflatoxin in Palmyrah root, flour and peanuts may lead to cancer of liver.

(vi) High content of salt as in salted fish may increase the risk for cancer of oesophagus.

(vii) Additives and contaminants, particularly in manufactured food, could increase the risk for cancer of oesophagus, stomach and bladder.

(viii) Hot foods may increase the risk for cancer of oral cavity and oesophagus.

(ix) Spices may increase the risk for cancer of oral cavity, oesophagus and stomach.

These factors only increase the risk of getting cancer especially with continued exposure and do not necessarily lead to cancer in all.

#### (b) **SMOKING.**

Nicotine and other products of combustion, have been shown to increase the risk of lung cancer and at certain other sites. The risk depends on the amount smoked per day, for how long, and the strength of nicotine and in certain cases whether associated with alcohol intake as well.

#### (c) **ALCOHOL.**

This has been shown to increase the risk of getting cancer of oesophagus, mouth, liver and bladder particularly when associated with smoking

#### (d) **BETEL CHEWING.**

This increases the risk of cancer of oral cavity. The tobacco in the chew has been shown to be the chief damaging component.

(e) Exposure to factors mentioned under Extrinsic carcinogens, mainly environmental and occupational and also some (but very few) drugs taken for long time; eg Phenacetin affecting kidney and Immunosuppressives leading to lymphomas and Oral contraceptives to cancer of breast.



### 3. PREVENTION OF CANCER

From what has been discussed under factors influencing cancer formation, it is possible that adoption of certain measures can, reduce the chance of developing it. In this, the cooperation of not only the individual, but also that of others such as Industrialists and the Government is necessary. Some measures are indicated below:

#### 1. Attention to Diet

(a) Consumption of a nourishing diet, particularly including Fresh vegetables and fruits and not deficient in iron and vitamin A. Iron is available in meat, egg yolk, liver, leafy vegetables, gingelly, kurakkan, palmyrah jaggery. Vitamin A is available in milk, fish, in "yellow" vegetables such as carrots, pumpkin and fruits such as papaw and mango.

(b) Avoidance of excessive fat and protein. As mentioned earlier this applies to the affluent classes only in this country, for, the intake of these items by others, in this country is even below the required amount. They must continue to take more protein.

(c) Avoidance of hot food, food with much spices, salt and salted fish.

(d) Avoidance of fungus contaminated, palmyrah root or flour and peanuts and other items.

(e) Avoidance of artificially manufactured items as far as possible.

(f) Avoidance of sweetened foods as far as possible.

#### 2. Avoidance of Alcohol, Smoking, Betel Chewing

#### 3. Living away from industrial areas

#### 4. Avoiding continued use of drugs, not prescribed by medical personnel

#### 5. Seeking early treatment for certain premalignant conditions such as papilloma, leucoplakia, chronic ulcer



6. Those pursuing certain occupations should in consultation with health authorities adopt certain measures to minimise the contact with known carcinogens: Eg. Use of masks, gloves, adoption of hygienic measures such as bath after work, nonemployment of high risk persons, avoiding use of known carcinogen as raw material as far as possible, modifying raw material to produce nonharmful products, safe disposal of harmful byproducts, etc.

## 4. EARLY WARNING SYMPTOMS AND SIGNS

Until the measures mentioned are strictly followed, because some have a predisposition to form certain cancers and because it is impractical, at the moment, to follow certain of the measures (financial or environmental reasons), it is possible that some may still develop cancer. However, as, mentioned before, if cancer is detected early, it is possible to completely cure it in many cases and as such, it is important to know the early warning symptoms and signs. Those who develop any of these symptoms and signs should consult a doctor at THE EARLIEST.

### (i) Unexplained loss of appetite or weight

Loss of appetite may occur in many conditions, as for example in acute fevers, tuberculosis, mental conditions, alcoholism, etc and so also can weight loss in some conditions. However loss of appetite and weight loss can occur in cancer at many sites, particularly the oesophagus, stomach, blood cancers, & hence one should consult a doctor and find out whether it is due to cancer or other causes. It should also be borne in mind that either loss of appetite or loss of weight may not occur in all cancers so that if any of the other symptoms or signs occur, still one must consult a doctor.

### (ii) Difficulty in swallowing.

If there is a blockage to the passage of swallowed food downwards, it can be due to cancer of the oesophagus (or even some other conditions). If the difficulty develops in those over about 40 years of age, almost certainly, it is due to cancer of oesophagus or pharynx.

### (iii) Indigestion

Inability to consume the normal amount of food, or a feeling of the food not digesting, a feeling of fullness and discomfort of the abdomen after meal could be due to cancer of the stomach.



#### (iv) Alteration in bowel habits

A rapid development of constipation, constipation, alternating with diarrhoea, Bleeding with passage of mucus per rectum, could signify a cancer of the large bowel.

#### (v) "Abnormal Bleeding"

Bleeding from many sites could be due to cancer, though there are other causes too. Bleeding per rectum may be due to cancer of large bowel, blood in urine due to cancer in urinary passages, vomiting blood due to cancer of stomach and excessive or irregular bleeding due to cancer of the womb.

#### (vi) A lump in the breast or a lump else where

Any lump anywhere in the body that grows fast is suspicious. If a lump that has been not growing or growing slowly starts to grow rapidly, it is almost certain that it is becoming cancerous. On the other hand, one must remember that there are very slow growing cancers too. The best advice is, if you have a lump, consult a doctor.

Not all lumps in the breast are cancers but if one has a lump in the breast one should consult a doctor and find out whether it is cancer or not. Females could from time to time palpate their own breasts to find out whether a lump is present. It is essential to palpate with the pulp (flat) of the fingers and not the tip of fingers. If the breast is palpated with the tips of fingers or if it is picked up between fingers, a feeling of there being a lump will occur even in a normal breast.

#### (VII) Non healing ulcer

An ulcer that does not heal, say in three weeks needs consultation.

Any ulcer in the oral cavity must be reported early to the doctor. Cancer of oral cavity can occur not only in betel chewers but also in others eg, the nutritionally deficient, smokers, those with ragged tooth, etc. Tobacco should not be taken with the betel.



**(VIII) Persistent Cough or Hoarseness of Voice (more than three weeks)**

This could indicate cancer of lung or voice box

**(IX) Change in the behaviour of an existing lump or birth mark**

This change may be a rapid increase in growth, bleedings or increased pigmentation or appearance of growths or mark surrounding the original one.

**(X) Persistent Jaundice.**

Jaundice due to other causes usually subsides in two weeks or so but if it continues it may mean, cancer of Pancreas.

In conclusion, it is hoped that, the reader now understands that cancers are of various types, causing varying damage in various individuals, the same type perhaps causing more damage in one individual than the other, that cancer is not hereditarily transmitted, that many factors in its causation can be avoided, and even otherwise, if it is detected early, it can be completely cured in many cases. It is important that he reads the last two chapters over and over again.



