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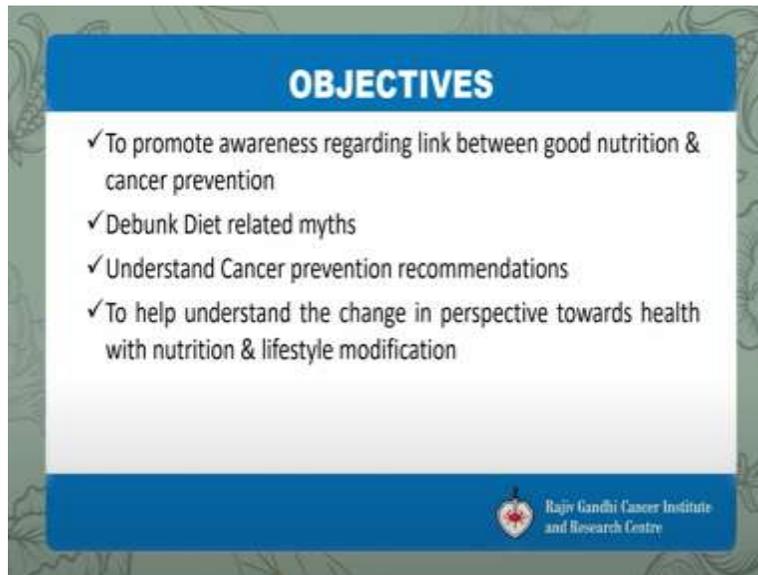
**Week-09**  
**Lecture 68: Nutrition: Does it Really Matter?**

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Namaskar. Today we will learn about a very sensitive but an important topic, nutrition. Does it really matter? Once someone is diagnosed from a disease, they go to a doctor and then if they are asked to go to a dietitian or a nutritionist then only they will think about that yes we have to modify our diet in terms of completing the treatment. But we have seen there is a very steep increase these days specifically in non-communicable diseases like diabetes, heart problems, high blood pressure, cancer so on. So, today we will learn about what is the importance of nutrition and how this should be an integral part of any treatment.

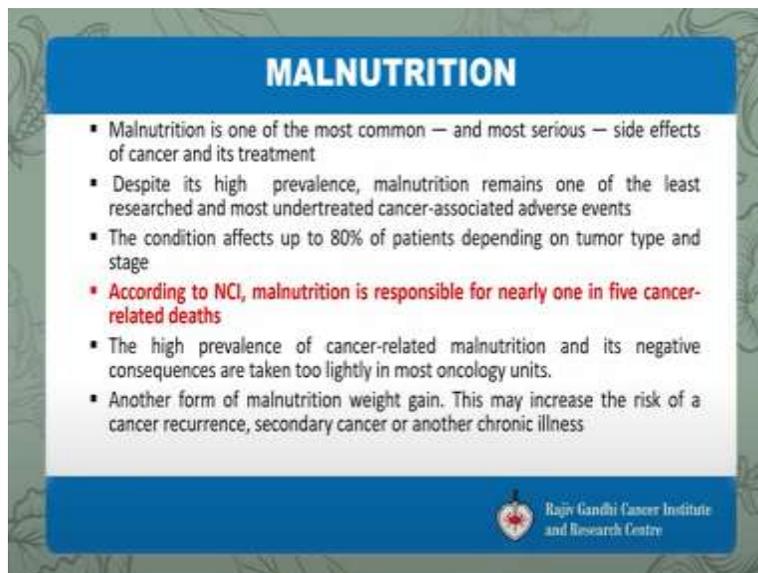
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The objectives for today's learning session are as follows.

To promote awareness regarding the link between good nutrition and cancer prevention. To debunk the diet related myths, to understand the cancer prevention recommendations, to help understand the change in perspective towards health with nutrition and lifestyle modification.

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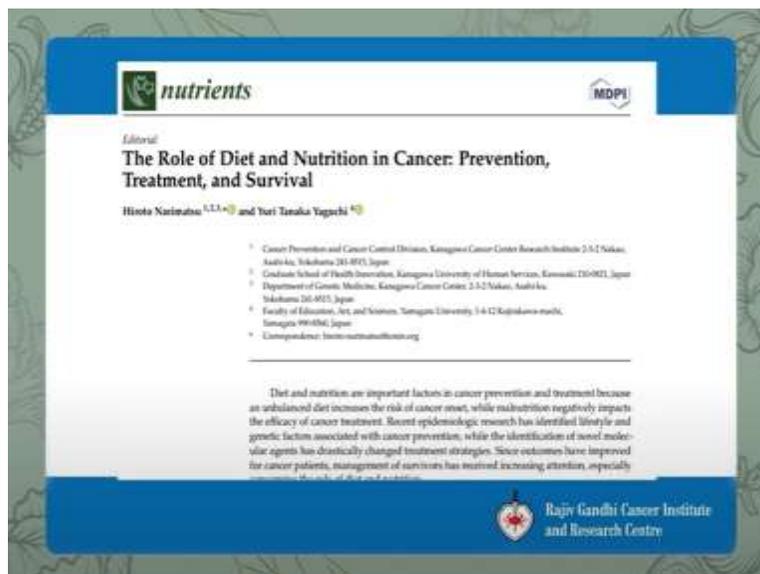
Malnutrition. This is one of the most common and most serious side effects of cancer and its treatment.

Despite its high prevalence, malnutrition remains one of the least researched and most under treated cancer associated adverse events. This condition affects up to 80% of the patients depending on the tumor type and stage. According to National Cancer Institute, malnutrition is responsible for nearly 1 in 5 cancer related deaths that means if there are 100 patients who have been diagnosed with cancer, out of them 20 patients will die because of malnutrition and not due to the disease. So, this is a very high number. The high prevalence of cancer related malnutrition and its negative consequences are taken too lightly in most oncology units.

Another form of malnutrition is weight gain. Generally, we see malnutrition as when a patient starts losing weight, there is fat loss, there is loss of muscle mass and we see the patient going very cachexic and weak. But there is another form of malnutrition in terms of weight gain. This may increase the risk of a cancer reoccurrence, secondary cancer or another chronic illness. Malnutrition is rarely common during the cancer treatment and the journey.

Sometimes weight loss in itself is a diagnostic symptom of cancer. Unfortunately, this remains very, very under diagnosed and generally the mindset of the people, the patients, the families is that because the patient is having cancer, this is bound to happen.

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I will share with you few research studies which states that there is a positive role of diet and nutrition in cancer prevention, treatment and survival.

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**Nutrition for Cancer Prevention**

According to the [World Health Organization](#), "between 30–50% of cancers can currently be prevented by avoiding risk factors and implementing existing evidence-based prevention strategies." Among these evidence-based strategies are the 2012 American Cancer Society (ACS) Guidelines for Cancer Prevention which have a strong correlation between increased adherence to diet recommendations and decreased cancer mortality. See below for detailed diet recommendations.

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According to the World Health Organization, between 30 to 50 percent of cancers can currently be prevented by avoiding risk factors and implementing existing evidence-based prevention strategies. Among these evidence-based strategies are the 2012 American Cancer Society guidelines for cancer prevention which have a strong correlation between increased adherence to diet recommendations and decreased cancer mortality.

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Review. *J. Am. Res. Nutr.* 2020 Sep 23;40(2):287-301. doi: 10.1146/annurev-nutr-011120-041140. Epub 2020 Jun 16.

**The Role of Diet in Cancer Prevention and Chemotherapy Efficacy**

Steven D. Michalek <sup>1</sup>

Affiliations → expand

PMID: 32543948 | PMCID: PMC7448814 | DOI: 10.1146/annurev-nutr-011120-041140

Free PMC article

**Abstract**

Despite great advances in treatment, cancer remains a leading cause of death worldwide. Diet can greatly impact health, while caloric restriction and fasting have putative benefits for disease prevention and longevity. Strong epidemiological associations exist between obesity and cancer, whereas healthy diets can reduce cancer risk. However, less is known about how diet might impact cancer once it has been diagnosed and particularly how diet can impact cancer treatment. In the present review, we discuss the links between obesity, diet, and cancer. We explore potential mechanisms by which diet can improve cancer outcomes, including through hormonal, metabolic, and immune/inflammatory effects, and present the limited clinical research that has been published in this arena. Though data are sparse, diet intervention may reduce toxicity, improve chemotherapy efficacy.

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This is a research which was published in 2020. The topic says the role of diet in cancer prevention and chemotherapy efficacy. Despite great advances in treatment, cancer remains a leading cause of death. Diet can greatly impact health while calorie restriction and fasting have putative benefits for disease prevention and longevity. So, there are many researches which are being done and they show that there is a positive relation between diet strategies and prevention of cancer.

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There was this another article which stated that what is the link between cancer and diet. Some cancerous factors such as genetics and environment are out of our control, but the research suggests that about 70 percent of the lifetime risk of cancer is within a power to change including diet. Along with avoidance of cigarettes, limiting alcohol, reaching a healthy weight and getting regular exercises are all great steps for prevention of cancer. Adopting a healthy diet can also play a vital role. What you eat and do not can have actually a powerful effect on your health including your risk of cancer.

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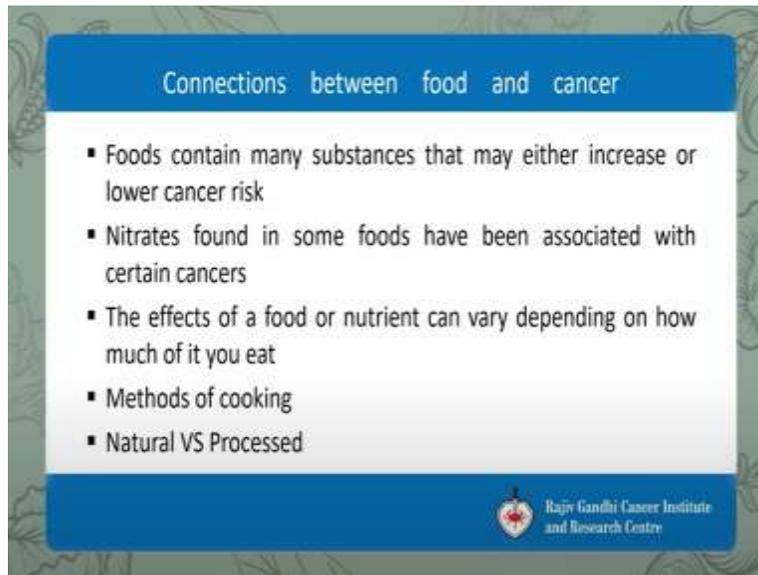


This is another study, another research article which was published in the year 2019. This states that cancer can be prevented with nutrition and lifestyle. Nutrition is now emerging as a very pivotal component of any treatment modality. The current research continuously pays an emphasis on inclusion of nutrition as a part of any treatment modality for cancer treatment whether it is chemotherapy, surgery, radiation, immunotherapy or stem cell transplantation. Now we will learn that what are the connections if any between food and cancer.

Foods contain many substances that may either increase or lower the cancer risk. I will explain this with an example. Fiber is a very important nutrient, we all know it is important for good health. We have seen that where people decrease fiber in their diet for whatever reasons, the chances of colorectal cancers are higher in them. Research has also proven that.

So, by including a good amount of fiber in our diets on a regular basis, the chances of colon cancer can be reduced. Now, few food products specifically the packed, preserved and processed food items, junk foods, we all know they are calorie dense, but nutrient deficient food items. So, regular inclusion of these foods can actually increase the risk of cancer.

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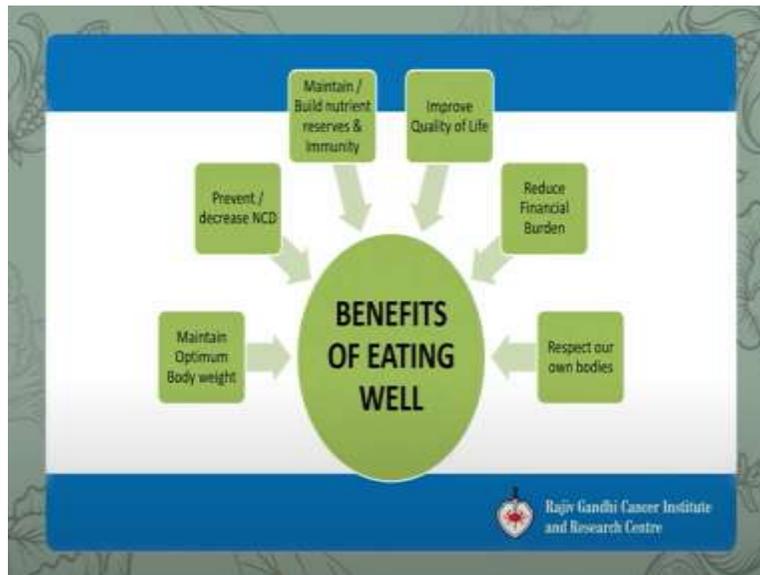
Nitrates found in some foods have been associated with certain cancers. Many people are in the habit of consuming processed non-veg foods like sausages and many other things.

Research has proven that these food items contain lot of nitrates and nitrites which are proven carcinogens. The effect of a food or nutrient can vary depending on how much of it you eat. Suppose if we are eating a very healthy component, but it has to be in proper portion size as we all know that excess of everything can actually be more detrimental. So, the portion size is also equally important of any food however healthy it may be. Methods of cooking, these also have definitely an impact on our health.

We all know that deep frying is not a very healthy method, but these days what is seen that people generally have a tendency to eat deep fried foods on a regular or a weekly basis like samosa or bread pakora or many other deep fried foods. Specifically if we are eating these deep fried foods in a oil which is being repeatedly heated, this can also increase the chances of cancer. Natural versus processed food items. Natural food items have always an edge over and above the processed food items. When a particular food is processed and packed into a packet, there are losses of nutrients.

Our body requires nutrients on a daily basis to function properly. So, there should be more of natural food items as compared to processed food items in our daily diet.

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What are the benefits of eating well? This has always been a question for many of us that why should we eat food? So, let us discuss what are the benefits. The first and the foremost is, that right quantity and quality of nutrients help us to maintain an optimum body weight. The right and healthy foods help to prevent or decrease the chances of contracting non-communicable diseases like cancer, diabetes, high blood pressure, high cholesterol and the list is endless.

It also helps to maintain and build nutrient reserves and immunity. We all know that nutrients like calcium, iron, magnesium, potassium, they are important for our health and vitality. So, if we are eating good food, we will be giving our bodies the right kind of fuel on a daily basis so that our bodies can function in a proper way. Improve quality of life. Macro-nutrients like calories and proteins are another very important nutrients and help us to maintain our day-to-day activities of daily living.

If there is a protein deficiency then slowly over a period of time there will be a loss of lean mass. And a loss of lean mass generally increases fatigue and slowly and slowly the person starts getting dependent on other people of the family or surroundings for their own daily activities like combing hair, brushing teeth, they might require assistance even to go to the washroom also. Eating well also helps to reduce the financial burden. How? If we are eating good food, we will fall less sick because our immune system will work very efficiently. If our immunity is not supporting us, we will start feeling sick more often and cause infections like pneumonia, fever, diarrhea and it could be any.

If we are falling sick on a regular basis, we will have to go to the doctor or a hospital quite often. We will be paying the doctor's bills, we will be paying the cost for the medicines, any test which has been prescribed and of course the follow up, we will again have to go to the hospital. It will increase the financial implications. On the other hand, if we are working, then we will have to take leaves from a regular office work. It might lead to a salary reduction.

Sometimes we do not link this to our health, but directly indirectly eating good food will help us maintain our good health and help to maintain our financial budgets. Respect our own bodies. Our body is a gift of nature from God to us.

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So, let us strive to eat healthy foods, so that at least we are able to respect this gift of nature which is given by God. Protective foods, as you all can see in the list, there are many pictures.

These are all good source of antioxidants, berries, cherries, watermelon, carrots, all forms of green leafy vegetables, turmeric, ginger. These all come into the category of protective foods. These foods have lot of antioxidants and help us to combat with the oxidative stress which we are dealing with on a regular basis in our daily lives. A good amount of antioxidants help us to improve our immune systems and keep infections away from ourselves.

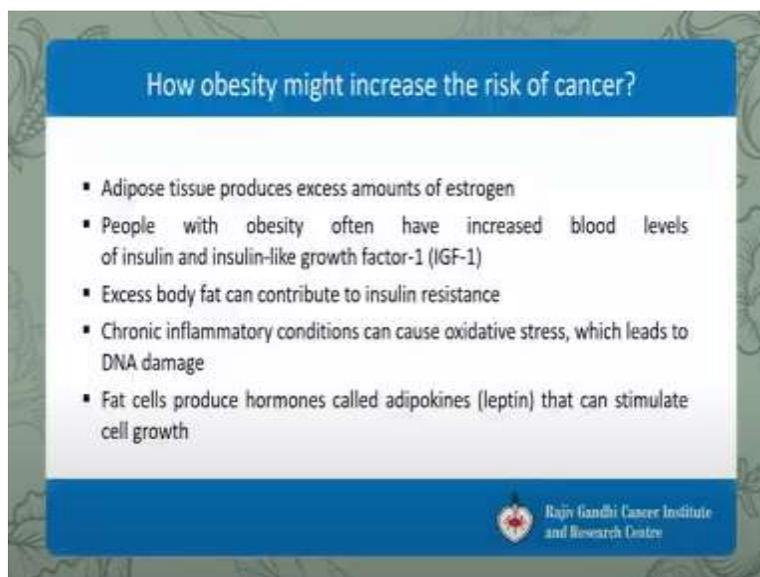
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Unfortunately, what are we eating these days? So, we can just have a comparison that what were the protective foods which we should be including in our regular diets.

But for whatever reasons, it could be taste, it could be availability, we are now just indulging into these harmful foods which are junk food, fried foods, these are not good for systems, our bodies have not been designed to deal with such kind of foodstuffs. Now, these foodstuffs if we continue to take on for a longer duration, there are chances that we might up ending gaining weight.

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How obesity might increase the risk of cancer? If we are eating lot of calories which leads to excess gain in the weight and the adipose tissue increases. Adipose tissue produces excess amounts of estrogen. This is a hormone which is linked to increase in cell proliferation which is cancer.

People with obesity often have increased blood levels of insulin and insulin like growth factor 1 which is again known to divide the cells very quickly and cancer is nothing but an increase in the multiplication and division of cells. Excess body fat can contribute to insulin resistance. Chronic inflammatory conditions can cause oxidative stress which leads to DNA damage and can lead to cancer. FAT cells are thought to produce hormones called as adipokines that can stimulate cell growth which can again lead to DNA damage and eventually lead to cancer.

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So, now we will discuss few healthy eating habits which are important to maintain on a regular basis in our daily lives so that we can function very healthy.

Fill ourselves with fiber. Fiber is a very important component of our diet. Good sources of fiber include whole grain cereals, pulses, nuts, fruits and vegetables. Choose healthy fats. These days there is lot of confusion what is a healthy fat. People can choose a wide variety from olive oil, from mustard oil, sesame or till oil, groundnut oil, homemade desi ghee consumed in limit is also counted as a good source of healthy fat.

Try and avoid having excess amount of deep fried things and specifically which are packed food items, they contain lot amount of trans fat. Cut down on sugar and refined

carbohydrates. Sugar is a part of our daily diet. If someone has diabetes, they should cut down on sugar. If people are overweight, they should cut down on sugar.

Sugar is again used as a preservative agent or as a taste enhancer in many of the packed and processed food items. So, limit your consumption for the same. A colorful diet. Colours, nature has given us many colours in forms of different colour fruit and vegetables. Every colour is associated with a different form of antioxidant.

Colour red will give you antioxidants like lycopene, then you have green colour, yellow colour, orange. So, nature has given lot of colours. Every color will give you a different antioxidant which will in turn help you fight with the free radicals and improve your immunity. Try and include at least 5 different colors of fruits and vegetables in your daily diet. It can be in the form of fresh fruits, salads, vegetables, cooked vegetables or in the form of juices and soups.

Use natural spices and flavors. These days there is an increased trend in the consumption of packaged masalas in the form of kitchen king, rajma masala, paneer tikka masala, the list is endless. There is a suggestion that we should try and refrain from such masalas and use naturally available herbs and spices in our diet to extract the maximum benefit. We should include garlic, turmeric, ajwain, hing, zeera. Mother nature has given n number of herbs and spices to augment the taste, the flavor in the diet and also there will be an added advantage of increased immunity.

Limit red meat and non-veg foods. Non-veg foods like mutton, chicken, fish, they are thought to be increasing inflammation in our body and cancer is already an inflammatory disease. So, limit your consumption of these kind of food products. Say no to junk food. The meaning of the word junk itself is trash. If something trash is given to you, will you accept it? I am sure not.

So, why are we giving our bodies junk food? Just to satisfy our taste buds. So, now there is a question, what is important to us, health or taste? This is we have to decide for ourselves. Eliminate processed and preserved packaged foods, limit alcohol, smoking, be physically active. Apart from making the right changes in your dietary pattern, it is equally important to include regular physical activity in your lifestyle. Maintain a healthy weight.

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Preparation of food is also very important. How we are preparing, apart from what we are preparing. So, choosing healthy food is not the only important factor in prevention of cancer. It also matters how we prepare, store and cook our food. Eat at least some form of raw fruits and vegetables as they tend to have the highest amounts of vitamins and minerals.

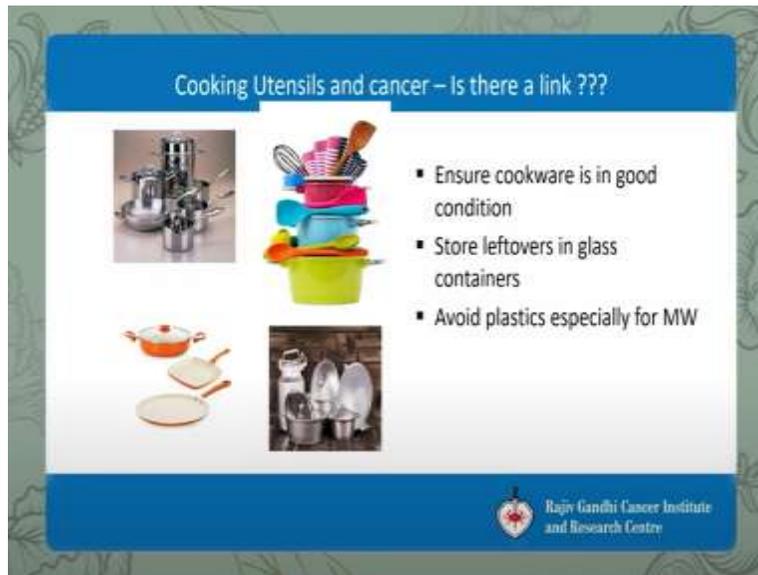
When cooking vegetables, steam only tender, do not overcook, this preserves more of the vitamins. Choose better ways of cooking, avoid deep frying especially frying in the same oil. Steaming, sautéing, poaching, stir frying are much better methods as compared to deep frying. Wash all fruits and vegetables, this is very very important. Washing properly with water before consumption, it might not eliminate all pesticide residue, but definitely it will reduce.

So, hand hygiene is equally important and washing of fruits and vegetables is very very important. Avoid microwave cooking or heating as far as possible. Although the research has not given us very conclusive studies which shows a direct link, but still try and reduce the usage of microwave cooking. Consume fresh foods as far as possible.

These days we are living in a world where processed foods is actually become a very important part of our lives, but they have been preserved many artificial chemicals flavors have been added.

They must have been packed at least 2 weeks or 3 weeks before. So, try and consume fresh foods as far as possible.

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Cooking Utensils and cancer – Is there a link ???

- Ensure cookware is in good condition
- Store leftovers in glass containers
- Avoid plastics especially for MW

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Cooking utensils and cancer is there a link? Again here I will say that the research has still not given a very conclusive evidence that there is a direct link between using a specific form or a metal of utensils which can actually increase the risk of cancer, but yes there are few pointers which you should remember. Ensure that cookware is in a good condition, try and store leftovers in glass containers. If you are using plastics for microwave heating or cooking only use plastic cookware which is conducive for microwave usage.

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Why Is Eating Healthy So Hard?

- Setting a new habit is difficult
- Diet ads are difficult to escape
- Taste is more important than "HEALTH"
- Junk food is cheap & convenient & attractive
- Undisciplined daily routine & Work Pressure
- Food as a reward
- Think there is a magic pill to take care of their diet negligence if something goes wrong with their health
- Anything can be consumed in a "NORMAL DIET"

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Why is eating healthy so hard? Well, this is a very interesting question and I was able to jot down few points and wanted to discuss this with you all.

Setting a new habit is difficult. Whenever someone is asked or advised to make a change in the current dietary practices, the first question which comes is why we have to change this habit. In order to preserve or maintain our health, it is necessary to act in accordance with nature. So sometimes, the current practices which are following might not be very conducive to maintain health. So, we have to make a very conscious effort if we at all have to change our habits even if it is adopting a new habit or leaving a old habit.

Dietary ads are difficult to escape. This is a world of digitalization marketing. Foods are being advertised in a very very fancy way just to catch the attention of consumers. This actually ends up in buying things which are not good for our health. So, again be very very cautious in what you are picking after seeing such ads which are related to unhealthy food items.

Taste is more important than health. These days people are just eating to satisfy their taste buds. We do not understand sometimes or we do not give importance to what will be the consequences if we keep on eating only if the food is tasty and is not giving any nutrients to ourselves. Junk food is cheap, convenient and attractive. This is a very important thing that we would like to eat food which is attractive to us. But these days the kind of junk food which is being served in the market, I agree it is very attractive, but only to the pockets of the people who are trying to sell these.

So, try and refrain yourself from junk food at all cost. It is just burning a hole in your pocket, not giving any nutrients, it is just increasing the chances of you becoming more ill. Undisciplined daily routine and work pressure, these days both the genders are working. So, cooking at home has decreased and people are more dependent on the food which is available outside. Sometimes there is a morning meeting, there is a presentation to be given in the office and we are really hard pressed for time to have a breakfast. Maximum people they choose to skip their breakfast and once their meeting is over or their presentation is over by that time it is almost 12 or 1 and at that time they are so hungry, they would wish to eat anything which comes their way.

So these undisciplined work routines are actually playing havoc with the health. So just give 2 minutes, 5 minutes So, that we have a discipline routine a lifestyle and we eat good food for maintenance of health. Food as a reward, generally food is used as a reward with kids this is the most easy, do your homework and you will be given a chocolate. Do your exercise, you will be rewarded with something which you like it. This

way we are indirectly spoiling the kids and these days as we all know that childhood obesity is on the rise.

Even problems like diabetes, high blood pressure are now being seen in teenagers. So, a suggestion and a request, please stop using food as a reward. There can be other options also. People generally think that there is a magic pill to take care of their diet negligence if something goes wrong with their health. Many people have this mindset, let us eat, be merry and if at all we get sick, there is a pill, a tablet, a capsule which we can have and everything will be hunky-dory.

No, health is not like that. We have to actually make efforts and invest into our health. It is not like that you can eat anything and everything and then you can just take some tablets so that your health is fine. There is a notion that anything can be consumed in a normal diet. People think if they are healthy and they are not falling into the trap of disease, they can eat anything and everything which includes junk food, processed foods and other things.

It is not like that. In order to maintain our health, we have to invest daily in terms of choosing the right kind of food, cooking the right way and eating the right kind of food.

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The slide is titled "FOOD LABELS" in a blue header. Below the title, there is a list of four bullet points: "Food labels provide more than just nutrition facts, though.", "Ingredients", "Nutritional Information", and "Whether the food is organic, and certain health claims". To the right of the list, there are two images: the top one is a close-up of a "Nutrition Facts" label, and the bottom one is a collection of various food product labels, including one that says "REAL". At the bottom right of the slide, there is a logo for the "Rajiv Gandhi Cancer Institute and Research Centre".

This is one important area where I would like to draw your attention that is food labels. This can be often misleading why because people generally go out they buy foods either they have seen advertisement of that food product or their friends or relatives have

recommended or some practitioner has recommended, the recommendation could be from anywhere they just go pick up, see the basic pack which can say that it is sugar free, this is fat free and sometimes we fall into that trap. So before buying any packaged food product make sure you read the food label very well. The companies give major information which is there mentioned on the packet.

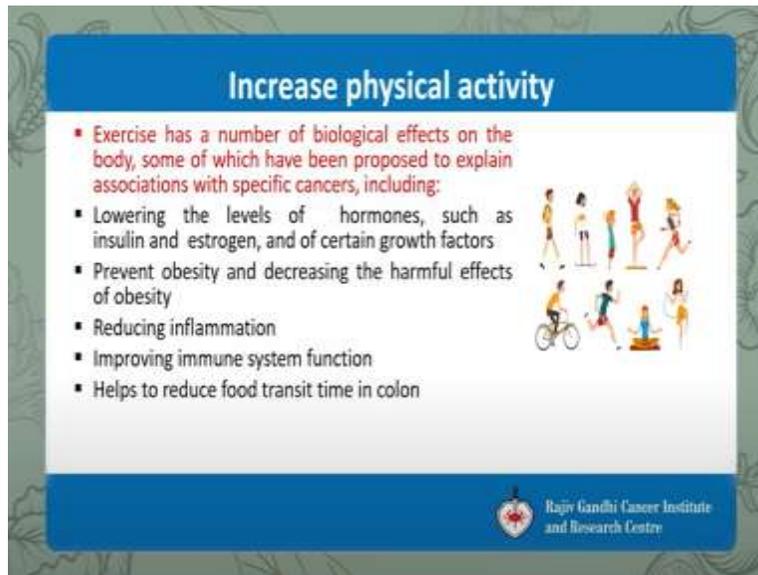
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What you need to check is that do not let the claims on the front fool you. It will be mentioned organic food, sugar free, fat free, good for health, no maida, but make sure that you read the ingredient list. I will give you one example that many biscuits and breads people think that if no sugar is written it is actually very healthy and can be consumed by overweight or diabetic people. But if you actually read carefully the ingredients the sugar word might not be there, but there are other forms of sugar which the general people do not know.

For example, maple syrup or it could be high corn fructose syrup. These are also different forms of sugar, but unknowingly we tend to pick up food products just because the word sugar is not mentioned. So, be careful and watchful before you pick up such products. Study the ingredients list, it is very important to thorough check whatever is mentioned on the pack. Watch out for the serving sizes as I have already explained that there are different names of sugar and the most important is that we should all check the expiry date, before picking up the packaged food product.

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**Increase physical activity**

- Exercise has a number of biological effects on the body, some of which have been proposed to explain associations with specific cancers, including:
  - Lowering the levels of hormones, such as insulin and estrogen, and of certain growth factors
  - Prevent obesity and decreasing the harmful effects of obesity
  - Reducing inflammation
  - Improving immune system function
  - Helps to reduce food transit time in colon

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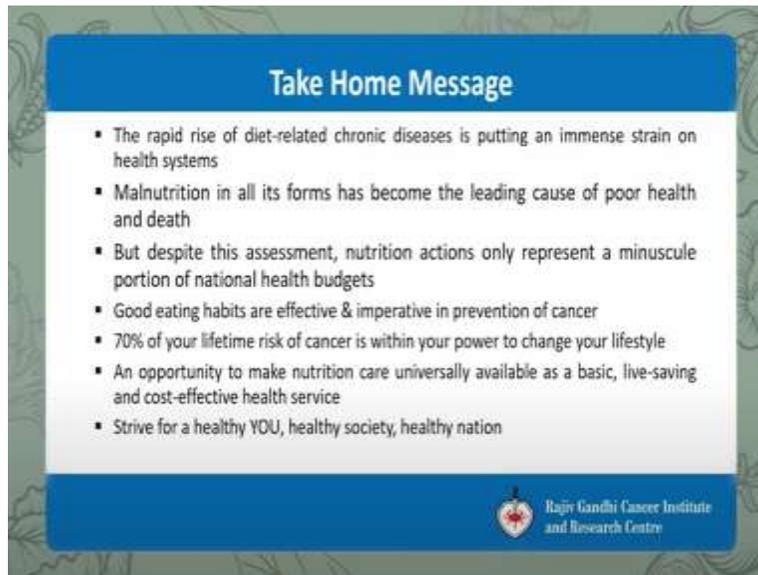
So, this was about diet apart from diet there is an important of physical activity in our daily routines.

So, that we can take care of our health. Exercise has a number of biological effects on the some of which have been proposed to explain association with specific cancers. How this works? It helps to lower the levels of hormones such as insulin and estrogen and certain growth factors. In one of the earlier slides, we had studied and learnt that there are certain hormones specifically in obese people which can increase the risk of cancer. So, including regular physical activity can help to bring down the levels of these hormones.

Prevention of obesity and decreasing the harmful effects. Exercise is also proven to reduce inflammation and help to improve our immune system. It also helps to reduce the food transit time in colon and helps to prevent constipation. So, we are almost through with this lecture today. After almost finishing this session, now I have a question for all of you.

What would you like to choose? You can see from the slide there are two options. I am sure you will be choosing the right option for yourself so that you are healthy.

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**Take Home Message**

- The rapid rise of diet-related chronic diseases is putting an immense strain on health systems
- Malnutrition in all its forms has become the leading cause of poor health and death
- But despite this assessment, nutrition actions only represent a minuscule portion of national health budgets
- Good eating habits are effective & imperative in prevention of cancer
- 70% of your lifetime risk of cancer is within your power to change your lifestyle
- An opportunity to make nutrition care universally available as a basic, life-saving and cost-effective health service
- Strive for a healthy YOU, healthy society, healthy nation

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What is the take home message from today's session? The rapid rise of diet related chronic diseases is putting an immense strain on the healthcare system. Malnutrition in all forms has become the leading cause of poor health and death. Despite this assessment, nutrition actions only represent a minuscule portion of national health budgets. Good eating habits are effective and imperative in prevention of cancer and other non-communicable diseases.

70% of your lifetime risk of cancer is within your power to change your lifestyle. Let us make nutrition an opportunity to make nutrition care universally available as a basic life-saving and cost-effective health service. Let us strive for a healthy you, healthy society and a healthy nation. I hope this lecture will be of use to you and you will make a conscious change in your lifestyle to make yourself a better version of you. It is time actually to change our eating habits. Thank you.