The Microbiome
Why Is It Important

By Eli Follick

I know that cancer is a terrible disease. Far be it for me to try to tell you how to avoid it, cure it, or treat it. But I can share with you information to help you be as healthy as possible as you fight cancer and live with it. And maybe, just maybe, I may be able to help you make it through your battle a little easier and help you be at your best as you receive the treatments that can be difficult to take. And one more thought, if you have a caregiver like a spouse, a relative, a friend, or neighbor, I experienced why it's important to make sure that individual is cared for as well. For that person to help you, he or she has to take care of him or her self to be able to help you.

No single food can protect against cancer, but eating more foods that fight it will help reduce the effects of the disease according to the American Institute of Cancer Research. Diet absolutely plays a role in the fight against cancer. Cancer can take a long time to develop so what we eat every day - the choices we make every day - can have an effect on the disease. In fact, food and beverage intake can integrate with cancer treatment to mitigate treatment-related toxicities, support treatment success, and, possibly, prevent recurrences.

A healthy diet can reduce cancer in several ways:

Reduced inflammation - this can help fight the effects of cancer

Fiber benefits - fiber can reduce the circulating levels of estrogen and may help enhance the treatments for breast cancer

Protection of antioxidants and phytochemicals - certain foods contain antioxidants which prevent damage to cells. Plant-based foods also contain phytochemicals - compounds that aren't vitamins or minerals but also benefit the body

Good choices include berries, tomatoes, broccoli, carrots, tea and coffee, ground flax seed, turmeric, spinach, and quinoa. Some to avoid include alcohol, too much added sugar, ultra-processed foods, and meats cooked at high temperature.

How does any of this information relate to the subject of my talk today - the importance of the microbiome and its relation to our health. The human digestion system is essentially a long tube, but it serves a very important role in the body's functioning. It is in the process of digestion, particularly in the large intestine, where the food we eat meets the gut bacteria and other organisms that live,

thrive, and play an incredibly important role in every part of our body and in every aspect of our health.

Recent studies have explored the connection between the gut microbiota - the collection of bacteria and other microorganisms that live in the gastrointestinal tract - and how they interact with every organ, every system, and every aspect of disease and health. The focus of many of these studies has been on the diversity of the gut microbiota and how variations in that composition might impact our health. For instance, a 2021 cross-sectional study found that higher gut microbial diversity was linked with a reduced incidence of Type 2 Diabetes. Generally, in fact, a more diverse gut microbiome is thought to be a healthier one.

While science is still uncovering specifics, we do know that various dietary practices impact our gut microbiomes. When it comes to eating and improving the health of our gut, understanding common buzzwords can be helpful in taking the steps to learning more.

GUT MICROBIOTA - A collection of microorganisms, including bacteria, fungi, viruses, and more, that live within the body's digestive tract.

MICROBIOTA ACCESSIBLE CARBOHYDRATES (MACs) - Carbohydrates that are resistant to being digested by a person's digestive system and so are made available to microorganisms in the gut to metabolize into beneficial compounds, such as short-chain fatty acids.

PREBIOTICS - Indigestible plant fibers that help promote the growth of beneficial microorganisms in the gut.

PROBIOTICS - Live bacteria and yeasts found in certain foods such as yogurt and sauerkraut that are good for health, often by helping improve or restore the gut microbiota.

POSTBIOTICS - The waste left behind after prebiotics and probiotics have been digested. Health-promoting postbiotics include amino acids, vitamins B12 and B6 and K, pantothenic acid, niacin, biotin, folate, and antimicrobial peptides, subtances that help slow the growth of dangerous bacteria. These various vitamins are either byproducts of fermentation or are excreted by the gut bacteria. The ability to produce these important vitamins may help us maintain adequate levels of them.

SYNBIOTICS - Beneficial mixtures of prebiotics and probiotics.

Understanding a few basics can make it easier to make decisions about what types of probiotics and probiotic-containing foods might be right for you. These tips may help:

1. Know that probiotics are available in many different forms. Fermented foods that have not been sterilized (the sterilization process kills probiotics). This includes yogurt, unpasteurized sauerkraut, pickles,

kimchi, and miso paste. I mentioned sauerkraut - this is not hearsay. Certain lactic acid bacteria in sauerkraut produce conjugated linoleic acid. It is suggested that this bacteria may help protect against cancer and atherosclerosis. Atherosclerosis happens when the arteries narrow and harden due to plaque buildup.

2. Be aware of how the product was processed. Some fermented foods are pasteurized (heat-treated for partial sterilization) which kills bacteria - both bad and good. Additionally, fermented foods that are not refrigerated likely don't contain living microbes.
3. Check with your health care provider before using probiotics to treat any medical condition. Probiotics generally can be safely consumed by most people but some people, such as those with immunocompromised conditions, may need more specific guidance on whether probiotics are safe for them and, if so, on the type and amount of probiotic-containing foods, beverages, and or supplements to consume. A knowledgeable health care provider might be able to provide more specifics on the type or strain of probiotic to look for as well as the amount recommended to use for a particular health condition.

Prebiotics are a category of complex carbohydrates. They provide nourishment to the bacteria in the gut. They are typically fermented by bacteria after arriving in the large intestine and help promote the growth of healthy bacteria in the gut. All prebiotics are fiber but not all fiber is prebiotic. This is why the term "MACs" (Microbiota-accessible carbohydrates) is used to describe the type of fiber that is resistant to digestion and prebiotic in nature.

In order for a food ingredient to be classified as a prebiotic, it must meet a few criteria. These criteria include resisting stomach acidity and absorption in the upper gastrointestinal tract, being fermented by the intestinal microbiota, and stimulating growth and/or activity of the intestinal bacteria.

Although not all fiber is prebiotic, eating a diet that is higher in fiber has many benefits. Research indicates that people who eat a higher-fiber diet tend to have a larger variety of bacteria in their microbiota.

A simple strategy to improve your diet and health is to focus on adding a few more high-fiber items to your grocery cart, with a focus on complex carbohydrates. Add such items into your meals and snacks throughout the week to slowly increase your daily fiber intake. Whole grains, beans, lentils, other legumes (peas, soybeans, peanuts), nuts, seeds, and higher-fiber fruits and

vegetables are always healthy whole-food choices. (It's important to increase your fluid intake when you are increasing fiber to help prevent constipation). Eat plenty of cruciferous vegetables, such as broccoli, brussels sprouts, cabbage, cauliflower, and spinach. Eat plenty of asparagus. Also indulge in yellow and deep orange vegetables such as carrots, pumpkin, squash and yams. Apples, berries (including blueberries, raspberries and strawberries), nuts, cantaloupes, cherries, grapes, legumes (including chickpeas, lentils, and red beans), oranges, and plums all help to fight cancer and enhance the healthy variety of organisms in the microbiome. For example, broccoli contains indole-3-carbinol, a compound known to help eradicate many types of cancer cells on contact.

Eat onions and use garlic liberally, as it enhances the immune system and is a good cancer fighter. Crushing garlic and then leaving it to rest for ten minutes before use seems to raise the levels of its cancer-fighting component. Eat tomatoes which contain lycopene, an antioxidant that protects cells from oxidants associated with cancer. Eat tart cherries. They contain anthocyanins, antioxidants that may help prevent cancer and heart disease. A four-year study at the University of Illinois College of Medicine showed that high levels of antioxidants have a protective effect against cancer tumors.

Various types of mushrooms can be good sources of vitamins, minerals and amino acids. They have the ability to enhance the body's immune system T cells that seek and destroy cancer cells. Shitaki, enoki, and maitake mushrooms have been reported to have anticancer properties. To get this benefit it is better to cook, saute, boil in soup or heat the mushrooms before eating.

Don't forget to read food labels. This will help determine serving size and the grams of fiber per serving. Also, check the ingredient list to evaluate exactly what is in the food.

Now that we are all experts on the microbiome, I want to relate it to cancer and several other health challenges.

Cancer can affect every aspect of your health, including your appetite and diet. Your diet including food choices and decisions is very important during cancer treatment. Treatments such as chemotherapy and some forms of radiation therapy can cause a variety of side effects, including

Constipation, which can cause discomfort and reduce your desire to eat
Diarrhea, which can drain your body of important fluids and nutrients
Fatigue, which means you are less active, so you burn fewer calories and
You burn fewer calories and don't feel hungry during the day
Loss of taste, which can make food unappealing

Nausea and vomiting, which may reduce your appetite and cause weight Loss

Sometimes it also depends on the specific type of cancer you have.

Treatment for breast cancer and other blood cancers often involve Steroids. Steroids can actually increase your appetite and Increase your blood sugar levels which might lead to weight gain

Some also have hormone therapy after chemotherapy for breast cancer Or endometrial cancer. Some of these drugs may suppress production of estrogen, a hormone that plays an important role in metabolism. If your metabolism slows down you may put on weight.

Those with pancreatic cancer can find it difficult to maintain their weight since the pancreas plays a role in digesting food and this may lead to malnourishment.

Since cancer treatment can lead to fluctuations in appetite and body weight, it's important to pay close attention to your diet. In addition to helping you maintain a healthy weight, eating a balanced diet during chemotherapy or radiation therapy can:

Help manage side effects
Increase energy
Increase muscle tone
Preserve immune function
Reduce inflammation

Remember, the microbiome plays a role in every one of these results. So, what foods should you add to your diet during cancer treatment? Anyone with a chronic illness should eat foods high in protein, healthy fats, whole grains and vitamins and minerals. In fact, if possible, make these dietary adjustments before cancer treatment begins so you'll be healthier going into treatment.

Plant-based proteins: Some of the best foods to eat during chemotherapy or other cancer treatments are plant-based proteins. Not only is this feeding the microbiome but eating lots of vegetables as well as beans, legumes, nuts and seeds, can often help you maintain your weight and keep your immunity working. If you do eat animal protein, choose lean options like skinless chicken or fish (not fried but baked or sauteed.

Healthy fats: Monounsaturated and polyunsaturated fats also have health benefits. Avocados, olive oil, and walnuts are all high in omega-3 fatty acids, which help combat inflammation and improve cardiovascular health.

Healthy carbohydrates: When choosing carbohydrates, opt for foods that are minimally processed, like whole wheat, bran, and oats. These have soluble fiber, which helps maintain good gut bacteria. Soluble fiber also promotes the production of short-chain fatty acids, which lend a hand to everything from metabolism to cellular repair.

Vitamins and minerals: Vitamins and minerals help our bodies' enzymatic processes, which play a big role in boosting immune function and reducing inflammation. When possible, select foods fortified with vitamin D. These may include milk, orange juice, yogurt, and some cereals.

What foods should you avoid during cancer treatment? Be aware of what's going into your body during cancer treatment. Read nutrition labels and prepare as much of your own food as you can. It's best to stay away from highly refined, processed food. Try to avoid fried foods that may contain a lot of hydrogenated oils, which can increase inflammation. Also, some people with cancer may have compromised immune systems, consider skipping foods that may carry the risk of foodborne illnesses, including:

Lightly cooked or raw fish, such as sushi

Soft cooked eggs or foods that contain raw eggs, such as homemade mayonnaise

Unpasteurized cheeses and dairy products

Unwashed fruits or vegetables.

When you are planning your diet while in treatment, I suggest checking with registered dieticians who have specialized training in the nutritional needs of people with specific diseases. Your dietician can help you plan meals that give you the right number of calories and nutrients. It's important to build an eating plan that's practical for you. If you are busy in the evenings and don't have the energy or time to cook, consider making multiple portions of food that you can freeze ahead of time and take out to microwave when you are ready to eat. If you are on a tight budget, eating inexpensive nutritious foods like beans or frozen fruits and vegetables can go a long way. Don't forget - diet choices can help you manage cancer treatment side effects.

There are more than a trillion organisms in our gut microbiome. And there is another trillion organisms in the rest of our body. Every minute of every day, regardless if we are jogging or sleeping, there are approximately 2000 chemical and enzymatic reactions unfolding every minute in every one of those cells. It's

up to each one of us to do all we can to help those organisms do their job by feeding them all the right foods and beverages and avoiding anything we can that will inhibit their ability to help keep us healthy.