

Life After BMT

Updates from the Blood or Marrow Transplant Survivor Study

UAB INSTITUTE FOR CANCER
OUTCOMES & SURVIVORSHIP
The University of Alabama at Birmingham

BMTSS Progress

We hope this winter 2023 newsletter finds you well and that you and your families are staying safe and healthy. BMTSS is the Blood or Marrow Transplant Survivor Study. The BMTSS is currently ongoing at the University of Minnesota, the University of Alabama at Birmingham, and City of Hope. You are receiving this newsletter because you are a BMTSS participant. In this newsletter, we will provide information on two topics (1) cancers of the gastrointestinal (GI) tract, and (2) healthy living guidelines focused on the prevention of GI tract cancers. As a reminder, all of our older newsletters are available on our website: <https://www.uab.edu/medicine/icos/icos-research/bmt-study>.

This newsletter will give you an update on the BMTSS study's progress and let you know how your information is helping us to make further progress in understanding life after BMT. We do not require any action in response to this newsletter unless you have moved or changed your phone number. **We encourage you to update your contact information by sending us an email at bmtstudy@uabmc.edu or calling us at 855-903-2136.** Thank you so much for participating in BMTSS and helping us with this important research!

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For More Information:

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Recent BMTSS Publications

Blood or marrow transplantation (BMT) is used to treat a variety of blood cancers and other life-threatening illnesses. Long-term BMT survivors may develop health problems related to their treatment, including the development of new cancers. A recently published research paper, which used data collected from the BMT Survivor Study (BMTSS), evaluated the risk of developing cancers of the gastrointestinal (GI) tract after BMT, such as cancers of the colon and rectum, esophagus, stomach, liver and pancreas.

The cohort included 6,710 BMT survivors. Just over half of the survivors (3,444 [51.3%]) received an autologous transplant, and just under half (3,266 [48.7%]) received an allogeneic transplant. Most survivors had undergone transplant for non-Hodgkin lymphoma (1,551 [23.1%]), acute myeloid leukemia or myelodysplastic syndrome (1,442 [21.5%]), and plasma cell dyscrasias (1,319 [19.7%]). A total of 148 survivors developed cancers of the GI tract, at an average of 8.9 years (range, 0.3-36.6 years) following BMT. Researchers found that BMT survivors were nearly four times more likely to develop a cancer of the GI tract than people in the general population who had not undergone transplant. The risk for individual types of GI cancers (esophagus, liver, pancreas, stomach and colon/rectum) was also higher among BMT recipients compared to people in the general population. Older age (>45 years) at transplant, non-Hispanic White race/ethnicity, having an allogeneic transplant, and conditioning with cytarabine were associated with an increased risk of cancers of the GI tract. Chronic graft-vs-host disease was found to be associated with an increased risk for esophageal cancer. Conditioning with cytarabine (a type of chemotherapy, also known as Ara-C) was associated with increased risk for colon or rectal cancer. Allogeneic transplantation, anthracycline chemotherapy prior to BMT, and conditioning with etoposide (a type of chemotherapy) were associated with increased risk for liver cancer.

These findings identify BMT survivors at higher risk for specific types of cancers of the GI tract. This will help healthcare professionals to personalize follow-up care for survivors, ensuring that necessary screening is completed and appropriate tests are performed to diagnose GI cancers without delay.

For more information: McDonald A, Dai C, Meng Q, et al. Malignant Neoplasms of the Gastrointestinal Tract After Blood or Marrow Transplant. *JAMA Oncol*. Published online January 19, 2023. doi:10.1001/jamaoncol.2022.6569



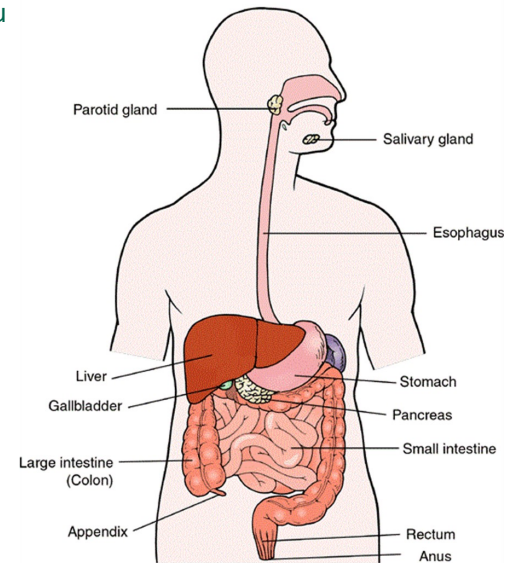
Ask the Researchers

We received several great questions since our last newsletter. Here we share some answers with you. Please send your questions to the BMTSS Study Staff by emailing bmtstudy@uabmc.edu

Question: What are the signs/symptoms of Gastrointestinal (GI) Cancers?

Gastrointestinal (GI) Cancers

The gastrointestinal (GI) tract is a vital part of eating, digestion, and waste removal in the body. Food passes through the esophagus (tube that carries food from the mouth to the stomach), is processed in the stomach and small intestines, and is ultimately removed from the body through the colon (large intestine) and rectum. GI cancer occurs when a tumor grows in one of these organs. Treatments for GI cancers are more effective when the cancer is discovered at an early stage. Therefore, it is important to know the early signs, symptoms, and risk factors associated with GI cancers.



Type of GI Cancer	Signs and Symptoms	Risk Factors
Esophageal cancer	Difficulty swallowing, indigestion, heartburn, vomiting, choking, weight loss	Tobacco use, heavy alcohol use, diet low in fruits and vegetables, obesity, gastroesophageal reflux (GERD), and Barrett's esophagus (long-term damage to the esophagus from GERD), and chronic graft-versus-host disease.
Gastric (stomach) cancer	Abdominal pain or discomfort, nausea, vomiting, loss of appetite, fatigue, blood in vomit or stools, weight loss	Being overweight or obese, infection with the <i>Helicobacter pylori</i> bacteria, diet high in salt-preserved foods or processed or charcoal-grilled meats. Diet low in fruits and vegetables. Smoking.
Colorectal cancer	Change in bowel habits, blood in stool, unexplained weight loss, weakness, fatigue	Overweight or obesity, physical inactivity, diet high in red or processed meats, smoking, heavy alcohol use, and BMT conditioning with cytarabine chemotherapy (ARA-C).
Pancreatic cancer	Dark urine, yellow discoloration of eyes and skin, abdominal pain, nausea, decreased appetite, weight loss	Smoking, obesity, diabetes, chronic inflammation of the pancreas (pancreatitis).
Liver cancer	Abdominal pain, weight loss, unexplained fevers, abdominal swelling, yellow discoloration of eyes and skin (jaundice), muscle loss	Chronic (long-term) infection with Hepatitis B or Hepatitis C, smoking, heavy alcohol use, obesity, allogeneic transplantation, anthracycline chemotherapy prior to BMT, and conditioning with etoposide chemotherapy.



Ask the Researchers Continued...

Common Risk Factors Associated with GI Cancers:

- Smoking
- Obesity
- Older age
- Heavy alcohol use

BMT-Related Risk Factors Associated with GI Cancers:

- Allogeneic transplant
- Non-Hispanic White race/ethnicity
- Older age (>45 years) at transplant
- Conditioning with cytarabine

Colorectal Cancer Screening

Colorectal cancer develops in the colon (large intestine) or rectum (chamber at the end of the large intestine where waste collects before it is expelled from the body).

The most common way to screen for colorectal cancer is a colonoscopy. During a colonoscopy, a tube with a small camera passes through the rectum to take pictures of the inside of the colon and look for polyps (growths in the lining of the bowel), which can be pre-cancerous or can contain cancer cells. A major benefit of colonoscopies is that pre-cancerous polyps can be removed before they become cancerous. Other types of screening for colorectal cancer include sigmoidoscopy (similar to colonoscopy, but checks for polyps only in the rectum and lower third of the colon); computed tomography (CT) colonography, which uses x-ray to produce images of the colon; or tests done on the stool (bowel movement).

It is important to understand that any positive screening test using these alternate methods will need to be followed up with a colonoscopy.

Colorectal Cancer Screening Guideline for the General Population:

Age	Recommendation
45-75	Colonoscopy every 10 years, sigmoidoscopy or CT colonography every 5 years, or stool testing every 1-3 years (depending on type of stool testing done)
76-85	Colonoscopy, sigmoidoscopy, or stool testing may be indicated depending on risk

Some people may need to start colorectal screening sooner than age 45 or need screening more often if they meet any of the following criteria:

- A personal history of colorectal cancer or polyps
- A personal history of inflammatory bowel disease (ulcerative colitis or Crohn's disease)
- A family history of colorectal cancer
- A genetic syndrome such as familial adenomatous polyposis (FAP) or Lynch syndrome

Resources:

- https://www.cdc.gov/cancer/colorectal/basic_info/screening/tests.htm
- https://www.cdc.gov/cancer/colorectal/basic_info/risk_factors.htm
- <https://www.yalemedicine.org/conditions/gastrointestinal-cancers>



Preventive Health

Guideline for Diet and Physical Activity for Cancer Prevention

According to the American Cancer Society, at least 18% of all cancers and about 16% of cancer deaths in the United States are related to excess body weight, physical inactivity, and/or poor nutrition. To help address these risk factors, the American Cancer Society has developed recommendations regarding nutrition and physical activity. The overall goal of these recommendations is to achieve and maintain a healthy weight throughout life.

Physical Activity

Recommendations:

Adults: Get 150 to 300 minutes of moderate intensity activity, or 75 to 150 minutes of vigorous intensity activity each week (or a combination of these). Getting to or exceeding the upper limit of 300 minutes is ideal.

Children and teens: Get at least 1 hour of moderate or vigorous intensity activity each day.



Examples of Moderate and Vigorous Intensity Physical Activities

Activity Type	Moderate Intensity	Vigorous Intensity
Exercise & Leisure	Walking, yoga	Running, swimming
Sports	Golf, badminton	Soccer, tennis
Home Activities	Vacuuming, gardening	Shoveling, heavy lifting
Workplace Activities	Walking and lifting as part of the job	Heavy manual labor

Nutrition: Keys to Healthy Eating

Include	Limit
<ul style="list-style-type: none"> • A variety of vegetables • Fruits, especially whole fruits • Whole grains 	<ul style="list-style-type: none"> • Red and processed meats • Sugar-sweetened beverages • Highly processed foods



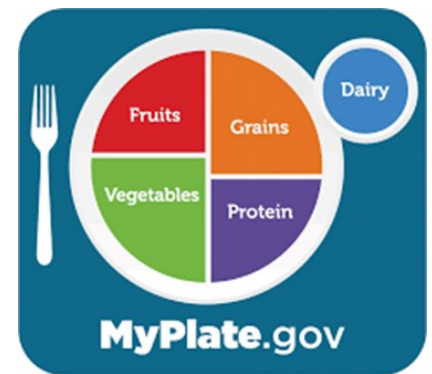
Preventive Health, Continued...

Looking More Closely at the American Cancer Society Dietary Guidelines:

- **Vegetables and fruits:** Eat at least 2½ to 3 cups of vegetables and 1½ to 2 cups of fruit each day, depending on your calorie requirements. Include a variety of different colored vegetables and fruits every day (green, red, orange, blue, purple, white, brown).
- **Whole grains:** At least half of your grains should be whole grains (such as brown rice, oatmeal, whole wheat or barley). For someone whose typical intake is about 2,000 calories per day, the recommended amount of grains is 6 ounces per day.
- **Fiber:** Plant foods such as legumes (beans, peas, lentils, soybeans), whole grains, fruits and vegetables, and nuts and seeds are good sources of fiber. High fiber diets are associated with a reduced risk of colorectal cancer.
- **Red and processed meats:** Choose protein foods such as fish, poultry, and beans more often than red meat. If you eat processed meat products (smoked, cured, salted), do so sparingly.
- **Added sugars:** Limit added sugars to less than 10 percent of your total calories per day.
- **Highly processed foods:** Packaged snack foods, sugary drinks, frozen desserts, bakery products, and fast foods all tend to be highly processed. These foods are typically high in saturated fat, added sugars, and/or sodium. Eat these foods sparingly. Aim to consume less than 10 percent of your daily calories from saturated fats and less than 2,300 milligrams of sodium per day.

Additional Nutrition Tips:

- Review nutrition labels on packaged foods and beverages. Nutrition labels are tools for making informed and healthy food choices.
- Pay attention to portion size.
- Choose a variety of options from each food group.
- The total number of calories a person needs each day varies depending on a number of factors, including the person's age, sex, height, weight, level of physical activity, and pregnancy or lactation status. The best way to evaluate calorie intake, in comparison to calorie needs, is by measuring body weight status.



RESOURCES:

- **U.S Dietary Guidelines:**
https://www.dietaryguidelines.gov/sites/default/files/2020-12/Dietary_Guidelines_for_Americans_2020-2025.pdf
- **American Cancer Society Guideline for Diet and Physical Activity:**
<https://www.cancer.org/healthy/eat-healthy-get-active/acs-guidelines-nutrition-physical-activity-cancer-prevention/guidelines.html>
- **Understanding Nutrition Labels:**
<https://www.fda.gov/food/nutrition-education-resources-materials/new-nutrition-facts-label>
- **Healthy Eating on a Budget:**
<https://www.myplate.gov/eat-healthy/healthy-eating-budget>