9/1/24, 9:22 PM Brain Tumor Survival Rate | Moffitt Brain Tumor Survival Rate Brain tumor survival rate depends primarily on the type of cancer that a patient has been diagnosed with. Some types of brain cancer, such as meningioma, ependymoma and oligodendroglioma, are highly treatable, while others may be less responsive to curative therapies. While the type of cancer such as CNS Lymphoma or Medulloblastoma is one of the most important factors in determining the overall survival rate, other details also have an impact. Younger patients tend to have more favorable survival rates than patients who develop brain cancer later in life, and patients who are diagnosed with lower-grade tumors often have better outcomes than patients with higher-grade malignancies. 1/3 https://www.moffitt.org/cancers/brain-cancer/survival-rate/ 9/1/24, 9:22 PM Brain Tumor Survival Rate | Moffitt What are the survival rates for brain cancer? The survival rates for brain cancer vary widely depending on the type of tumor and the age of the patient. Here are some basic survival rate statistics, as reported by the American Cancer Society: Oligodendroglioma - 90% for patients 20-44, 82% for patients 45-54 and 69% for patients 55-64 Meningioma - 84% for patients 20-44, 79% for patients 45-54 and 74% for patients 55 64 Glioblastoma - 22% for patients 20-44, 9% for patients 45-54 and 6% for patients 55 64 Ependymoma/anaplastic ependymoma - 92% for patients 20-44, 90% for patients 45 54 and 87% for patients 55-64 Anaplastic astrocytoma - 58% for patients 20-44, 29% for patients 45-54 and 15% for patients 55-64 Although survival rates can be informative for patients who want to know more about their possible prognoses, these broad statistics aren't truly indicative of any one person's projected outcome. That's because general survival rates: Are based on data collected from a large population of people Don't take into account personal factors, such as a patient's unique response to treatment Are based on data from patients who entered treatment at least ve years ago. As a result, they do not account for advancements in research and treatment that have occurred since that time Florida's Largest NCI Cancer Center Recognized as a leader in cancer excellence, Mo tt is the state's largest National Cancer Institute-designated Comprehensive Cancer Center by cancer patient volumes. 2/3 https://www.moffitt.org/cancers/brain-cancer/survival-rate/ 9/1/24, 9:22 PM Brain Tumor Survival Rate | Moffitt Brain cancer treatment at Moffitt Cancer Center At Mo tt Cancer Center, we take an individualized approach to brain tumor treatment, offering patients a wide range of evidence-based therapies that a team of experts will recommend for each patient's unique situation. More importantly, we see our patients as more than just statistics. Our brain cancer team works tirelessly to help our patients access the most bene cial therapies available while ensuring that they maintain the best possible quality of life. Medically reviewed by Michael Vogelbaum, MD, PhD, Program Leader, Chief of Neurosurgery, Neuro-Oncology Program. For more information about the brain tumor survival rate and how it can be improved by appropriate treatment, call 1-844-747-6546 or complete a new patient registration form. No referral is necessary to consult with our oncologists specializing in brain cancer. Call Today 1-844-747-6546 ©Copyright 2024 Mo tt Cancer Center Discover More Br ain Cancer Grades W hat Are the Symptoms of End-Stage Brain Cancer? M eningioma Survival Rate 3/3 https://www.moffitt.org/cancers/brain-cancer/survival-rate/

8/31/24, 10:09 PM Cancer Prevention Overview - NCI Cancer Prevention Overview (PDQ®)–Patient Version Go to Health Professional Version What Is Prevention? Cancer prevention is action taken to lower the chance of getting cancer. In 2023, about 1.9 million people will be diagnosed with cancer in the United States. In addition to the physical problems and emotional distress caused by cancer, the high costs of care are also a burden to patients, their families, and to the public. By preventing cancer, the number of new cases of cancer is lowered. Hopefully, this will reduce the burden of cancer and lower the number of deaths caused by cancer. Cancer is not a single disease but a group

of related diseases. Many things in our genes, our lifestyle, and the environment around us may increase or decrease our risk of getting cancer. Scientists are studying many di erent ways to help prevent cancer, including the following: • • • • • Ways to avoid or control things known to cause cancer. Changes in diet and lifestyle. Finding precancerous conditions early. Precancerous conditions are conditions that may become cancer. Chemoprevention (medicines to treat a precancerous condition or to keep cancer from starting). Risk-reducing surgery. Carcinogenesis KEY POINTS • • Carcinogenesis is the process in which normal cells turn into cancer cells. Changes (mutations) in genes occur during carcinogenesis. 1/13 https://www.cancer.gov/about-cancer/causes-prevention/patient-prevention-overview-pdq 8/31/24, 10:09 PM Cancer Prevention Overview - NCI Carcinogenesis is the process in which normal cells turn into cancer cells. Carcinogenesis is the series of steps that take place as a normal cell becomes a cancer cell. Cells are the smallest units of the body and they make up the body's tissues. Each cell contains genes that guide the way the body grows, develops, and repairs itself. There are many genes that control whether a cell lives or dies, divides (multiplies), or takes on special functions, such as becoming a nerve cell or a muscle cell. Changes (mutations) in genes occur during carcinogenesis. Changes (mutations) in genes can cause normal controls in cells to break down. When this happens, cells do not die when they should and new cells are produced when the body does not need them. The buildup of extra cells may cause a mass (tumor) to form. Tumors can be benign or malignant (cancerous). Malignant tumor cells invade nearby tissues and spread to other parts of the body. Benign tumor cells do not invade nearby tissues or spread. Risk Factors KEY POINTS • • Factors that are known to increase the risk of cancer • • • • Cigarette smoking and tobacco use Infections Radiation Immunosuppressive medicines after organ transplant Factors that may a ect the risk of cancer • • • • • • Diet Alcohol Physical activity Obesity Diabetes Environmental risk factors Scientists study risk factors and protective factors to nd ways to prevent new cancers from starting. Anything that increases your chance of developing cancer is called a cancer risk 2/13 https://www.cancer.gov/about-cancer/causes-prevention/patient-prevention-overview-pdq 8/31/24, 10:09 PM Cancer Prevention Overview - NCI factor; anything that decreases your chance of developing cancer is called a cancer protective factor. Some risk factors for cancer can be avoided, but many cannot. For example, both smoking and inheriting certain genes are risk factors for some types of cancer, but only smoking can be avoided. Risk factors that a person can control are called modi able risk factors. Many other factors in our environment, diet, and lifestyle may cause or prevent cancer. This summary reviews only the major cancer risk factors and protective factors that can be controlled or changed to reduce the risk of cancer. Risk factors that are not described in the summary include certain sexual behaviors, the use of estrogen, and being exposed to certain substances at work or to certain chemicals. Factors that are known to increase the risk of cancer Cigarette smoking and tobacco use Tobacco use is strongly linked to an increased risk for many kinds of cancer. Smoking cigarettes is the leading cause of the following types of cancer: • • • • • • • • • • Acute myelogenous leukemia (AML). Bladder cancer. Cervical cancer. Esophageal cancer. Kidney cancer. Lung cancer. Oral cavity cancer. Pancreatic cancer. Stomach cancer. Not smoking or quitting smoking lowers the risk of getting cancer and dying from cancer. Scientists believe that cigarette smoking causes about 30% of all cancer deaths in the United States. See the following PDQ summaries for more information: • • • Lung Cancer Prevention Lung Cancer Screening Cigarette Smoking: Health Risks and How to Quit Infections 3/13 https://www.cancer.gov/about-cancer/causes-prevention/patient-prevention-overview-pdq 8/31/24, 10:09 PM Cancer Prevention Overview - NCI Certain viruses and bacteria are able to cause cancer. Examples of cancer-causing viruses and bacteria include: • • • • Human papillomavirus (HPV) increases the risk for cancers of the cervix, penis, vagina, anus, and oropharynx. Hepatitis B and hepatitis C viruses increase the risk for liver cancer. Epstein-Barr virus increases the risk for Burkitt lymphoma. Helicobacter pylori increases the risk for gastric cancer. Two vaccines to prevent infection by cancer-causing agents have been

developed and approved by the US Food and Drug Administration (FDA). One is a vaccine to prevent infection with hepatitis B virus. The other protects against infection with strains of human papillomavirus (HPV) that cause cervical cancer. Scientists continue to work on vaccines against infections that cause cancer. See the following PDQ summaries for more information: • • • • • Cervical Cancer Causes, Risk Factors, and Prevention Cervical Cancer Screening Liver Cancer Causes, Risk Factors, and Prevention Stomach Cancer Causes and Risk Factors Oral Cavity, Oropharyngeal, Hypopharyngeal, and Laryngeal Cancers Prevention Radiation Being exposed to radiation is a known cause of cancer. There are two main types of radiation linked with an increased risk of cancer: • • Ultraviolet radiation from sunlight: This is the main cause of nonmelanoma skin cancers. Ionizing radiation including: • • Medical radiation from tests to diagnose cancer such as x-rays, CT scans, uoroscopy, and nuclear medicine scans. Radon gas in our homes. Scientists believe that ionizing radiation causes leukemia, thyroid cancer, and breast cancer in women. Ionizing radiation may also be linked to myeloma and cancers of the lung, stomach, colon, esophagus, bladder, and ovary. Being exposed to radiation from diagnostic x-rays increases the risk of cancer in patients and x-ray technicians. Diagnostic radiation in children and adolescents has been linked with a higher risk of cancers at a young age. The growing use of CT scans over the last 20 years has increased exposure to ionizing radiation. The risk of cancer also increases with the number of CT scans a patient has and 4/13 https://www.cancer.gov/about-cancer/causes-prevention/patient-prevention-overview-pdq 8/31/24, 10:09 PM Cancer Prevention Overview - NCI the radiation dose used each time. See the following PDQ summaries for more information: • • • • Breast Cancer Prevention Breast Cancer Screening Skin Cancer Prevention Lung Cancer Prevention Immunosuppressive medicines after organ transplant Immunosuppressive medicines are used after an organ has been transplanted from one person to another. These medicines stop an organ that has been transplanted from being rejected. These medicines decrease the body's immune response to help keep the organ from being rejected. Immunosuppressive medicines are linked to an increased risk of cancer because they lower the body's ability to keep cancer from forming. The risk of cancer, especially cancer caused by a virus, is higher in the rst 6 months after organ transplant, but the risk lasts for many years. Factors that may affect the risk of cancer Diet The foods that you eat on a regular basis make up your diet. Diet is being studied as a risk factor for cancer. It is hard to study the e ects of diet on cancer because a person's diet includes foods that may protect against cancer and foods that may increase the risk of cancer. It is also hard for people who take part in the studies to keep track of what they eat over a long period of time. This may explain why studies have di erent results about how diet a ects the risk of cancer. Some studies have shown that a diet high in fat, proteins, calories, and red meat increases the risk of colorectal cancer, but other studies have not shown this. It is not known if a diet low in fat and high in ber, fruits, and vegetables lowers the risk of colorectal cancer. Alcohol Studies have shown that drinking alcohol is linked to an increased risk of the following types of cancers: • • Oral cancer. Esophageal cancer. 5/13 https://www.cancer.gov/about-cancer/causes-prevention/patient-prevention-overview-pdq 8/31/24, 10:09 PM Cancer Prevention Overview - NCI • • Breast cancer. Colorectal cancer (in men). Drinking alcohol may also increase the risk of liver cancer and female colorectal cancer. See the following PDQ summaries for more information: • • • • • • Breast Cancer Prevention Colorectal Cancer Prevention Lung Cancer Prevention Esophageal Cancer Prevention Oral Cavity, Oropharyngeal, Hypopharyngeal, and Laryngeal Cancers Prevention Liver Cancer Causes, Risk Factors, and Prevention Physical activity Studies show that people who are physically active have a lower risk of certain cancers than those who are not. It is not known if physical activity itself is the reason for this. Some studies show that physical activity protects against postmenopausal breast cancer and endometrial cancer. See the following PDQ summaries for more information: • • • Breast Cancer Prevention Colorectal Cancer Prevention Endometrial Cancer Prevention Obesity Studies show that obesity is linked to a higher risk of the following types of cancer: • • • • • •

Postmenopausal breast cancer. Colorectal cancer. Endometrial cancer. Esophageal cancer. Kidney cancer. Pancreatic cancer. Some studies show that obesity is also a risk factor for cancer of the gallbladder and liver cancer. 6/13 https://www.cancer.gov/about-cancer/causes-prevention/patient-prevention-overview-pdq 8/31/24, 10:09 PM Cancer Prevention Overview - NCI Studies have shown that people who lose weight decrease their risk of these cancers. See the following PDQ summaries for more information: • • • • Breast Cancer Prevention Colorectal Cancer Prevention Endometrial Cancer Prevention Lung Cancer Prevention Diabetes Some studies show that having diabetes may slightly increase the risk of having the following types of cancer: • • • • • • • • • • Bladder cancer. Breast cancer in women. Colorectal cancer. Endometrial cancer. Liver cancer. Lung cancer. Oral cancer. Oropharyngeal cancer. Ovarian cancer. Pancreatic cancer. Diabetes and cancer share some of the same risk factors. These risk factors include the following: • • • • • Being older. Having obesity. Smoking. Not eating a healthy diet. Not exercising. Because diabetes and cancer share these risk factors, it is hard to know whether the risk of cancer is increased more by diabetes or by these risk factors. Studies are being done to see how medicine that is used to treat diabetes a ects cancer risk. 7/13 https://www.cancer.gov/about-cancer/causes-prevention/patient-prevention-overview-pdq 8/31/24, 10:09 PM Cancer Prevention Overview - NCI Environmental risk factors Being exposed to chemicals and other substances in the environment has been linked to some cancers: • • Links between air pollution and cancer risk have been found. These include links between lung cancer and secondhand tobacco smoke, outdoor air pollution, and asbestos. Drinking water that contains a large amount of arsenic has been linked to skin, bladder, and lung cancers. Studies have been done to see if pesticides and other pollutants increase the risk of cancer. The results of those studies have been unclear because other factors can change the results of the studies. Interventions That Are Known to Lower Cancer Risk KEY POINTS • • Chemoprevention is being studied in people who have a high risk of developing cancer. Studies have shown that weight loss surgery lowers cancer risk. An intervention is a treatment or action taken to prevent or treat disease, or improve health in other ways. Many studies are being done to nd ways to keep cancer from starting or coming back. Chemoprevention is being studied in people who have a high risk of developing cancer. Chemoprevention is the use of substances to lower the risk of cancer, or keep it from recurring. The substances may be natural or made in the laboratory. Some chemopreventive agents are tested in people who are at high risk for a certain type of cancer. The risk may be because of a precancerous condition, family history, or lifestyle factors. Taking one of the following agents may lower the risk of cancer: • Selective estrogen receptor modulators (SERMS) such as tamoxifen or raloxifene have been shown to reduce the risk of breast cancer in women at high risk. SERMS may cause side e ects, such as hot ashes, so they are not often used for prevention of cancer. For more information, see Breast Cancer Prevention. 8/13 https://www.cancer.gov/about-cancer/causes-prevention/patient-prevention-overview-pdq 8/31/24, 10:09 PM Cancer Prevention Overview - NCI • • Finasteride has been shown to lower the risk of prostate cancer. For more information, see Prostate Cancer Prevention. COX-2 inhibitors may prevent colon and breast cancer. COX-2 inhibitors may cause heart problems. Because COX-2 inhibitors may cause heart problems there have not been many studies on their use to prevent cancer. For more information, see Colorectal Cancer Prevention and Breast Cancer Prevention. Studies have shown that weight loss surgery lowers cancer risk. Weight loss surgery, also called bariatric surgery, is a procedure that people with obesity can have to lose weight and improve their overall health and quality of life. The surgery changes the anatomy of the stomach or changes the way the body absorbs nutrients. A person who undergoes this procedure will lose a lot of weight and as a result, will have a decreased risk of cancers that are linked to being overweight. See the NCI website for more information about cancer prevention. Interventions That Are Not Known to Lower Cancer Risk KEY POINTS • • • Aspirin has not been shown to prevent most cancers. Vitamin and dietary supplements have not been shown to prevent cancer. New ways to prevent cancer are being studied

in clinical trials. Aspirin has not been shown to prevent most cancers. Aspirin has been studied as chemoprevention. The studies show mixed results but most have shown that aspirin does not prevent cancer. However, there is evidence that taking aspirin for long periods of time may prevent colorectal cancer in certain people. For more information, see Colorectal Cancer Prevention. Results from a randomized trial suggest that taking aspirin may make cancer grow more quickly in the elderly, but longer follow up is needed to con rm these results. Bleeding in the gastrointestinal tract or brain is a side e ect of aspirin. Even though aspirin has not been shown to reduce the risk of most cancers, it has many uses, including helping to lower the chances of dying from heart disease. Before beginning long-term aspirin use, it is important to talk with your doctor about the related bene ts and harms. Vitamin and dietary supplements have not been shown to prevent cancer. 9/13 https://www.cancer.gov/about-cancer/causes-prevention/patient-prevention-overview-pdq 8/31/24, 10:09 PM Cancer Prevention Overview - NCI An intervention is a treatment or action taken to prevent or treat disease, or improve health in other ways. There is not enough proof that taking multivitamin and mineral supplements or single vitamins or minerals can prevent cancer. The following vitamins and mineral supplements have been studied, but have not been shown to lower the risk of cancer: • • • • • • • • Vitamin B6. Vitamin B12. Vitamin E. Vitamin C. Beta carotene. Folic acid. Selenium. Vitamin D. The Selenium and Vitamin E Cancer Prevention Trial (SELECT) found that vitamin E taken alone increased the risk of prostate cancer. The risk continued even after the men stopped taking vitamin E. Taking selenium with vitamin E or taking selenium alone did not increase the risk of prostate cancer. Vitamin D has also been studied to see if it has anticancer e ects. Skin exposed to sunshine can make vitamin D. Vitamin D can also be consumed in the diet and in dietary supplements. Taking vitamin D in doses from 400–1100 IU/ day has not been shown to lower or increase the risk of cancer. The VITamin D and OmegA-3 TriaL (VITAL) is under way to study whether taking vitamin D (2000 IU/ day) and omega-3 fatty acids from marine (oily sh) sources lowers the risk of cancer. The Physicians' Health Study found that men who have had cancer in the past and take a multivitamin daily may have a slightly lower risk of having a second cancer. See the following PDQ summaries for more information: • • • • Breast Cancer Prevention Colorectal Cancer Prevention Lung Cancer Prevention Prostate Cancer Prevention New ways to prevent cancer are being studied in clinical trials. https://www.cancer.gov/about-cancer/causes-prevention/patient-prevention-overview-pdq 10/13 8/31/24, 10:09 PM Cancer Prevention Overview - NCI Information about clinical trials supported by NCI can be found on NCI’s clinical trials search webpage. Clinical trials supported by other organizations can be found on the ClinicalTrials.gov website. About This PDQ Summary About PDQ Physician Data Query (PDQ) is the National Cancer Institute's (NCI's) comprehensive cancer information database. The PDQ database contains summaries of the latest published information on cancer prevention, detection, genetics, treatment, supportive care, and complementary and alternative medicine. Most summaries come in two versions. The health professional versions have detailed information written in technical language. The patient versions are written in easy-to-understand, nontechnical language. Both versions have cancer information that is accurate and up to date and most versions are also available in Spanish. PDQ is a service of the NCI. The NCI is part of the National Institutes of Health (NIH). NIH is the federal government’s center of biomedical research. The PDQ summaries are based on an independent review of the medical literature. They are not policy statements of the NCI or the NIH. Purpose of This Summary This PDQ cancer information summary has current information about cancer prevention. It is meant to inform and help patients, families, and caregivers. It does not give formal guidelines or recommendations for making decisions about health care. Reviewers and Updates Editorial Boards write the PDQ cancer information summaries and keep them up to date. These Boards are made up of experts in cancer treatment and other specialties related to cancer. The summaries are reviewed regularly and changes are made when there is new information. The date on each summary ("Updated") is the

date of the most recent change. The information in this patient summary was taken from the health professional version, which is reviewed regularly and updated as needed, by the PDQ Screening and Prevention Editorial Board. Clinical Trial Information A clinical trial is a study to answer a scienti c question, such as whether one treatment is better than another. Trials are based on past studies and what has been learned in the laboratory. Each trial answers certain scienti c questions in order to nd new and better https://www.cancer.gov/about-cancer/causes-prevention/patient-prevention-overview-pdq 11/13 8/31/24, 10:09 PM Cancer Prevention Overview - NCI ways to help cancer patients. During treatment clinical trials, information is collected about the e ects of a new treatment and how well it works. If a clinical trial shows that a new treatment is better than one currently being used, the new treatment may become "standard." Patients may want to think about taking part in a clinical trial. Some clinical trials are open only to patients who have not started treatment. Clinical trials can be found online at NCI's website. For more information, call the Cancer Information Service (CIS), NCI's contact center, at 1-800-4-CANCER (1-800-422-6237). Permission to Use This Summary PDQ is a registered trademark. The content of PDQ documents can be used freely as text. It cannot be identi ed as an NCI PDQ cancer information summary unless the whole summary is shown and it is updated regularly. However, a user would be allowed to write a sentence such as “NCI’s PDQ cancer information summary about breast cancer prevention states the risks in the following way: [include excerpt from the summary].” The best way to cite this PDQ summary is: PDQ® Screening and Prevention Editorial Board. PDQ Cancer Prevention Overview. Bethesda, MD: National Cancer Institute. Updated . Available at: https://www.cancer.gov/about-cancer/causes-prevention/patient-prevention-overview-pdq. Accessed . [PMID: 26389424] Images in this summary are used with permission of the author(s), artist, and/or publisher for use in the PDQ summaries only. If you want to use an image from a PDQ summary and you are not using the whole summary, you must get permission from the owner. It cannot be given by the National Cancer Institute. Information about using the images in this summary, along with many other images related to cancer can be found in Visuals Online. Visuals Online is a collection of more than 3,000 scienti c images. Disclaimer The information in these summaries should not be used to make decisions about insurance reimbursement. More information on insurance coverage is available on Cancer.gov on the Managing Cancer Care page. Contact Us More information about contacting us or receiving help with the Cancer.gov website can be found on our Contact Us for Help page. Questions can also be submitted to Cancer.gov through the website’s E-mail Us. Updated: October 23, 2023 https://www.cancer.gov/about-cancer/causes-prevention/patient-prevention-overview-pdq 12/13 8/31/24, 10:09 PM Cancer Prevention Overview - NCI If you would like to reproduce some or all of this content, see Reuse of NCI Information for guidance about copyright and permissions. In the case of permitted digital reproduction, please credit the National Cancer Institute as the source and link to the original NCI product using the original product's title; e.g., “Cancer Prevention Overview (PDQ®)–Patient Version was originally published by the National Cancer Institute.” 13/13 https://www.cancer.gov/about-cancer/causes-prevention/patient-prevention-overview-pdq

8/31/24, 10:15 PM Cancer Screening Overview - NCI Cancer Screening Overview (PDQ®)–Patient Version Go to Health Professional Version What Is Cancer Screening? KEY POINTS • • • Cancer screening is looking for cancer before a person has any symptoms. There are di erent kinds of screening tests. Screening tests have risks. • • • • Some screening tests can cause serious problems. False-positive test results are possible. False-negative test results are possible. Finding the cancer may not improve the person's health or help the person live longer. Cancer screening is looking for cancer before a person has any symptoms. Screening tests can help nd cancer at an early stage, before symptoms appear. When abnormal tissue or cancer is found early, it may be easier to treat or

cure. By the time symptoms appear, the cancer may have grown and spread. This can make the cancer harder to treat or cure. It is important to remember that when your doctor suggests a screening test, it does not always mean he or she thinks you have cancer. Screening tests are done when you have no cancer symptoms. There are different kinds of screening tests. Screening tests include the following: • Physical exam and history: An exam of the body to check general signs of health, including checking for signs of disease, such as lumps or anything else that seems unusual. A history of the patient's health habits and past illnesses and treatments will also be taken. 1/13 https://www.cancer.gov/about-cancer/screening/patient-screening-overview-pdq 8/31/24, 10:15 PM Cancer Screening Overview - NCI • • • Laboratory tests: Medical procedures that test samples of tissue, blood, urine, or other substances in the body. Imaging procedures: Procedures that make pictures of areas inside the body. Genetic tests: A laboratory test in which cells or tissue are analyzed to look for changes in genes or chromosomes. These changes may be a sign that a person has or is at risk of having a speci c disease or condition. Screening tests have risks. Not all screening tests are helpful and most have risks. It is important to know the risks of the test and whether it has been proven to decrease the chance of dying from cancer. Some screening tests can cause serious problems. Some screening procedures can cause bleeding or other problems. For example, colon cancer screening with sigmoidoscopy or colonoscopy can cause tears in the lining of the colon. False-positive test results are possible. Screening test results may appear to be abnormal even though there is no cancer. A false positive test result (one that shows there is cancer when there really isn't) can cause anxiety and is usually followed by more tests and procedures, which also have risks. False-negative test results are possible. Screening test results may appear to be normal even though there is cancer. A person who receives a false-negative test result (one that shows there is no cancer when there really is) may delay seeking medical care even if there are symptoms. Finding the cancer may not improve the person's health or help the person live longer. Some cancers never cause symptoms or become life-threatening, but if found by a screening test, the cancer may be treated. There is no way to know if treating the cancer would help the person live longer than if no treatment were given. In both teenagers and adults, there is a rare risk of attempted or actual suicide in the rst year after being diagnosed with cancer. Also, treatments for cancer have side e ects. For some cancers, nding and treating the cancer early does not improve the chance of a cure or help the person live longer. What Is Informed and Shared Decision-Making? KEY POINTS 2/13 https://www.cancer.gov/about-cancer/screening/patient-screening-overview-pdq 8/31/24, 10:15 PM Cancer Screening Overview - NCI • Understanding the bene ts and harms of screening tests is important for making an informed choice about which screening tests are right for you. Understanding the benefits and harms of screening tests is important for making an informed choice about which screening tests are right for you. Before having any screening test, discuss the test with your doctor or other health care provider. Every screening test has both bene ts and harms. Your health care provider should talk to you about the bene ts and harms of a screening test and include you in the decision about whether the screening test is right for you. This is called informed and shared decision-making. 1. Your health care provider will talk to you about the possible bene ts, harms, and unknowns of a screening test. This may include information about the bene ts of nding a cancer early or the harms related to false test results, overdiagnosis, and overtreatment. Your health care provider may also give you information in a lea et, booklet, video, website, or other material. 2. After you understand the bene ts and harms of a screening test, you can decide whether or not you want to have the screening test based on what is best for you. Sometimes the harms and bene ts are closely matched and the decision about whether to have a screening test is hard to make. 3. Your health care provider will write your decision down in your medical record and order the screening test, if that was your decision. What Are the Goals of Screening Tests? KEY POINTS • • Screening tests have many goals. Screening tests are not meant to diagnose cancer. Screening tests have many goals. A screening test that works the way it should and

is helpful does the following: • • • • Finds cancer before symptoms appear. Screens for a cancer that is easier to treat and cure when found early. Has few false-negative test results and false-positive test results. Decreases the chance of dying from cancer. 3/13 https://www.cancer.gov/about-cancer/screening/patient-screening-overview-pdq 8/31/24, 10:15 PM Cancer Screening Overview - NCI Screening tests are not meant to diagnose cancer. Screening tests usually do not diagnose cancer. If a screening test result is abnormal, more tests may be done to check for cancer. For example, a screening mammogram may nd a lump in the breast. A lump may be cancer or something else. More tests need to be done to nd out if the lump is cancer. These are called diagnostic tests. Diagnostic tests may include a biopsy, in which cells or tissues are removed so a pathologist can check them under a microscope for signs of cancer. Who Needs to Be Screened? KEY POINTS • • Certain screening tests may be suggested only for people who have a high risk for certain cancers. Cancer screening research includes nding out who has an increased risk of cancer. Certain screening tests may be suggested only for people who have a high risk for certain cancers. Anything that increases the chance of cancer is called a cancer risk factor. Not every person with one or more risk factors will develop cancer, and it will develop in some people who don't have any known risk factors. Some screening tests are used only for people who have known risk factors for certain types of cancer. People known to have a higher risk of cancer than others include those who have any of the following: • • • • • • A personal history of cancer. A family history of cancer. Certain gene mutations (changes) that have been linked to cancer. Exposure to cancer-causing agents such as tobacco smoke or workplace chemicals. A blood clot that develops for no known reason. Older age. People who have a high risk of cancer may need to be screened more often or at an earlier age than other people. Cancer screening research includes finding out who has an increased risk of cancer. 4/13 https://www.cancer.gov/about-cancer/screening/patient-screening-overview-pdq 8/31/24, 10:15 PM Cancer Screening Overview - NCI Scientists are trying to better understand who is likely to get certain types of cancer. They study the things we do and the things around us to see if they cause cancer. This information helps doctors gure out who should be screened for cancer, which screening tests should be used, and how often the tests should be done. Since 1973, the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute has been collecting information on people with cancer from di erent parts of the United States. Information from SEER, research studies, and other sources is used to study who is at risk. How Is Cancer Risk Measured? Cancer risk is measured in di erent ways. The ndings from surveys and studies about cancer risk are studied and the results are explained in di erent ways. Some of the ways risk is explained include absolute risk, relative risk, and odds ratios. • • Absolute risk This is the risk a person has of developing a disease, in a given population (for example, the entire US population) over a certain period of time. Researchers estimate the absolute risk by studying a large number of people that are part of a certain population (for example, women in a given age group). Researchers count the number of people in the group who get a certain disease over a certain period of time. For example, a group of 100,000 women between the ages of 20 and 29 are observed for one year, and 4 of them get breast cancer during that time. This means that the one-year absolute risk of breast cancer for a woman in this age group is 4 in 100,000, or 4 chances in 100,000. Relative risk This is often used in research studies to nd out whether a trait or a factor can be linked to the risk of a disease. Researchers compare two groups of people who are a lot alike. However, the people in one of the groups must have the trait or factor being studied (they have been "exposed"). The people in the other group do not have it (they have not been exposed). To gure out relative risk, the percentage of people in the exposed group who have the disease is divided by the percentage of people in the unexposed group who have the disease. Relative risks can be: • • • Larger than 1: The trait or factor is linked to an increase in risk. Equal to 1: The trait or factor is not linked to risk. Less than 1: The trait or factor is linked to a decrease in risk. 5/13 https://www.cancer.gov/about-

cancer/screening/patient-screening-overview-pdq 8/31/24, 10:15 PM Cancer Screening Overview - NCI Relative risks are also called risk ratios. • Odds ratio In some types of studies, researchers don't have enough information to gure out relative risks. They use something called an odds ratio instead. An odds ratio can be an estimate of relative risk. One type of study that uses an odds ratio instead of relative risk is called a case-control study. In a case-control study, two groups of people are compared. However, the individuals in each group are chosen based on whether or not they have a certain disease. Researchers look at the odds that the people in each group were exposed to something (a trait or factor) that might have caused the disease. Odds describes the number of times the trait or factor was present or happened, divided by the number of times it wasn't present or didn't happen. To get an odds ratio, the odds for one group are divided by the odds for the other group. Odds ratios can be: • • • Larger than 1: The trait or factor is linked to an increase in risk. Equal to 1: The trait or factor is not linked to risk. Less than 1: The trait or factor is linked to a decrease in risk. Looking at traits and exposures in people with and without cancer can help nd possible risk factors. Knowing who is at an increased risk for certain types of cancer can help doctors decide when and how often they should be screened. Does Screening Help People Live Longer? KEY POINTS • • • Finding some cancers at an early stage (before symptoms appear) may help decrease the chance of dying from those cancers. Screening studies are done to see whether deaths from cancer decrease when people are screened. Certain factors may cause survival times to look like they are getting better when they are not. Finding some cancers at an early stage (before symptoms appear) may help decrease the chance of dying from those cancers. 6/13 https://www.cancer.gov/about-cancer/screening/patient-screening-overview-pdq 8/31/24, 10:15 PM Cancer Screening Overview - NCI For many cancers, the chance of recovery depends on the stage (the amount or spread of cancer in the body) of the cancer when it was diagnosed. Cancers that are diagnosed at earlier stages are often easier to treat or cure. Studies of cancer screening compare the death rate of people screened for a certain cancer with the death rate from that cancer in people who were not screened. Some screening tests have been shown to be helpful both in nding cancers early and in decreasing the chance of dying from those cancers. These include mammograms for breast cancer and sigmoidoscopy and fecal occult blood testing for colorectal cancer. Other tests are used because they have been shown to nd a certain type of cancer in some people before symptoms appear, but they have not been proven to decrease the risk of dying from that cancer. If a cancer is fast-growing and spreads quickly, nding it early may not help the person survive the cancer. Screening studies are done to see whether deaths from cancer decrease when people are screened. When collecting information on how long people with cancer live, some studies de ne survival as living 5 years after the diagnosis. This is often used to measure how well cancer treatments work. However, to see if screening tests are useful, studies usually look at whether deaths from the cancer decrease in people who were screened. Over time, signs that a cancer screening test is working include: • • • An increase in the number of early-stage cancers found. A decrease in the number of late-stage cancers found. A decrease in the number of deaths from the cancer. The number of deaths from cancer is lower today than it was in the past. It is not always clear if this is because screening tests found the cancers earlier or because cancer treatments have gotten better, or both. The Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute collects and reports information on survival times of people with cancer in the United States. This information is studied to see if nding cancer early a ects how long these people live. Certain factors may cause survival times to look like they are getting better when they are not. These factors include lead-time bias, overdiagnosis, and healthy screenee bias. • Lead-time bias Survival time for people with cancer is usually measured from the day the cancer is diagnosed until the day they die. People are often diagnosed after they have signs and symptoms of cancer. If a screening test leads to a diagnosis before a person has any symptoms, the person's survival time is increased because the date of

diagnosis is 7/13 https://www.cancer.gov/about-cancer/screening/patient-screening-overview-pdq 8/31/24, 10:15 PM Cancer Screening Overview - NCI earlier. This increase in survival time makes it seem as though screening helps people live longer when that may not be happening. This is called lead-time bias. Survival time may appear to be longer because the date of diagnosis is earlier for the people who are screened, but they may die at the same time they would have without the screening test. • • Overdiagnosis Sometimes, screening tests nd cancers that don't matter because they would have gone away on their own or never caused any symptoms. These cancers would never have been found if not for the screening test (for example, a computed tomography scan). Finding these cancers is called overdiagnosis. Overdiagnosis can make it seem like more people are surviving cancer longer, but in reality, these are people who would not have died from cancer anyway. Healthy screenee bias People who choose to have screening tests are often more health conscious than the general public and tend to make other healthy choices in their lives. People with early stage cancer found by screening may live longer than people who don't get screened. They may live longer because of the bene ts of their healthy lifestyle rather than screening. This is sometimes called healthy screenee bias. How do Screening Tests Become Standard Tests? KEY POINTS • • • • Results from research studies help doctors decide when a screening test works well enough to be used as a standard test. Di erent types of research studies are done to study cancer screening. The following types of studies are used to get information about cancer screening tests: • • • • • • Randomized controlled trials Nonrandomized controlled trials Cohort studies Case-control studies Ecologic studies Expert opinions Screening tests for cancer are being studied in clinical trials. 8/13 https://www.cancer.gov/about-cancer/screening/patient-screening-overview-pdq 8/31/24, 10:15 PM Cancer Screening Overview - NCI Results from research studies help doctors decide when a screening test works well enough to be used as a standard test. Evidence about how safe, accurate, and useful cancer screening tests are comes from clinical trials (research studies with people) and other kinds of research studies. When enough evidence has been collected to show that a screening test is safe, accurate, and useful, it becomes a standard test. Examples of cancer screening tests that were once under study but are now standard tests include: • • • Colonoscopy for colorectal cancer. Mammograms for breast cancer. Pap tests (Pap smears) for cervical cancer. Different types of research studies are done to study cancer screening. Cancer screening trials study new ways of nding cancer in people before they have symptoms. Screening trials also study screening tests that may nd cancer earlier or are more accurate than existing tests, or that may be easier, safer, or cheaper to use. Screening trials are designed to nd the possible bene ts and possible harms of cancer screening tests. Di erent clinical trial designs are used to study cancer screening tests. The strongest evidence about screening comes from research done in clinical trials. However, clinical trials cannot always be used to study questions about screening. Findings from other types of studies can give useful information about how safe, useful, and accurate cancer screening tests are. The following types of studies are used to get information about cancer screening tests: Randomized controlled trials Randomized controlled trials give the highest level of evidence about how safe, accurate, and useful cancer screening tests are. In these trials, volunteers are assigned randomly (by chance) to one of two or more groups. The people in one group (the control group) may be given a standard screening test (if one exists) or no screening test. The people in the other group(s) are given the new screening test(s). Test results for the groups are then compared to see if the new screening test works better than the standard test, and to see if there are any harmful side e ects. Using chance to assign people to groups means that the groups will probably be very much alike and that the trial results won't be a ected by human choices or something else. Nonrandomized controlled trials 9/13 https://www.cancer.gov/about-cancer/screening/patient-screening-overview-pdq 8/31/24, 10:15 PM Cancer Screening Overview - NCI In nonrandomized clinical trials, volunteers are not assigned randomly (by chance) to di erent groups. They choose which group they want to be in or the study leaders assign them. Evidence from

this type of research is not as strong as evidence from randomized controlled trials. Cohort studies A cohort study follows a large number of people over time. The people are divided into groups, called cohorts, based on whether or not they have had a certain treatment or been exposed to certain things. In cohort studies, the information is collected and studied after certain outcomes (such as cancer or death) have occurred. For example, a cohort study might follow a group of women who have regular Pap tests, and divide them into those who test positive for the human papillomavirus (HPV) and those who test negative for HPV. The cohort study would show how the cervical cancer rates are di erent for the two groups over time. Case-control studies Case-control studies are like cohort studies but are done in a shorter time. They do not include many years of follow-up. Instead of looking forward in time, they look backward. In case-control studies, information is collected from cases (people who already have a certain disease) and compared with information collected from controls (people who do not have the disease). For example, a group of patients with melanoma and a group without melanoma might be asked about how they check their skin for abnormal growths and how often they check it. Based on the di erent answers from the two groups, the study may show that checking your skin is a useful screening test to decrease the number of melanoma cases and deaths from melanoma. Evidence from case-control studies is not as strong as evidence from clinical trials or cohort studies. Ecologic studies Ecologic studies report information collected on entire groups of people, such as people in one city or county. Information is reported about the whole group, not about any single person in the group. These studies may give some evidence about whether a screening test is useful. The evidence from ecologic studies is not as strong as evidence from clinical trials or other types of research studies. Expert opinions Expert opinions can be based on the experiences of doctors or reports of expert committees or panels. Expert opinions do not give strong evidence about the usefulness of screening tests. 10/13 https://www.cancer.gov/about-cancer/screening/patient-screening-overview-pdq 8/31/24, 10:15 PM Cancer Screening Overview - NCI Screening tests for cancer are being studied in clinical trials. Information about clinical trials supported by NCI can be found on NCI’s clinical trials search webpage. Clinical trials supported by other organizations can be found on the ClinicalTrials.gov website. About This PDQ Summary About PDQ Physician Data Query (PDQ) is the National Cancer Institute's (NCI's) comprehensive cancer information database. The PDQ database contains summaries of the latest published information on cancer prevention, detection, genetics, treatment, supportive care, and complementary and alternative medicine. Most summaries come in two versions. The health professional versions have detailed information written in technical language. The patient versions are written in easy-to-understand, nontechnical language. Both versions have cancer information that is accurate and up to date and most versions are also available in Spanish. PDQ is a service of the NCI. The NCI is part of the National Institutes of Health (NIH). NIH is the federal government’s center of biomedical research. The PDQ summaries are based on an independent review of the medical literature. They are not policy statements of the NCI or the NIH. Purpose of This Summary This PDQ cancer information summary has current information about cancer screening. It is meant to inform and help patients, families, and caregivers. It does not give formal guidelines or recommendations for making decisions about health care. Reviewers and Updates Editorial Boards write the PDQ cancer information summaries and keep them up to date. These Boards are made up of experts in cancer treatment and other specialties related to cancer. The summaries are reviewed regularly and changes are made when there is new information. The date on each summary ("Updated") is the date of the most recent change. The information in this patient summary was taken from the health professional version, which is reviewed regularly and updated as needed, by the PDQ Screening and Prevention Editorial Board. Clinical Trial Information A clinical trial is a study to answer a scienti c question, such as whether one treatment is better than another. Trials are based on past studies and what has been learned in the https://www.cancer.gov/about-cancer/screening/patient-screening-

overview-pdq 11/13 8/31/24, 10:15 PM Cancer Screening Overview - NCI laboratory. Each trial answers certain scienti c questions in order to nd new and better ways to help cancer patients. During treatment clinical trials, information is collected about the e ects of a new treatment and how well it works. If a clinical trial shows that a new treatment is better than one currently being used, the new treatment may become "standard." Patients may want to think about taking part in a clinical trial. Some clinical trials are open only to patients who have not started treatment. Clinical trials can be found online at NCI's website. For more information, call the Cancer Information Service (CIS), NCI's contact center, at 1-800-4-CANCER (1-800-422-6237). Permission to Use This Summary PDQ is a registered trademark. The content of PDQ documents can be used freely as text. It cannot be identi ed as an NCI PDQ cancer information summary unless the whole summary is shown and it is updated regularly. However, a user would be allowed to write a sentence such as “NCI’s PDQ cancer information summary about breast cancer prevention states the risks in the following way: [include excerpt from the summary].” The best way to cite this PDQ summary is: PDQ® Screening and Prevention Editorial Board. PDQ Cancer Screening Overview. Bethesda, MD: National Cancer Institute. Updated . Available at: https://www.cancer.gov/about-cancer/screening/patient-screening-overview-pdq. Accessed . [PMID: 26389447] Images in this summary are used with permission of the author(s), artist, and/or publisher for use in the PDQ summaries only. If you want to use an image from a PDQ summary and you are not using the whole summary, you must get permission from the owner. It cannot be given by the National Cancer Institute. Information about using the images in this summary, along with many other images related to cancer can be found in Visuals Online. Visuals Online is a collection of more than 3,000 scienti c images. Disclaimer The information in these summaries should not be used to make decisions about insurance reimbursement. More information on insurance coverage is available on Cancer.gov on the Managing Cancer Care page. Contact Us More information about contacting us or receiving help with the Cancer.gov website can be found on our Contact Us for Help page. Questions can also be submitted to Cancer.gov through the website’s E-mail Us. Updated: October 20, 2023 https://www.cancer.gov/about-cancer/screening/patient-screening-overview-pdq 12/13 8/31/24, 10:15 PM Cancer Screening Overview - NCI If you would like to reproduce some or all of this content, see Reuse of NCI Information for guidance about copyright and permissions. In the case of permitted digital reproduction, please credit the National Cancer Institute as the source and link to the original NCI product using the original product's title; e.g., “Cancer Screening Overview (PDQ®)–Patient Version was originally published by the National Cancer Institute.” 13/13 https://www.cancer.gov/about-cancer/screening/patient-screening-overview-pdq

8/31/24, 10:16 PM Coping – Daily Life - NCI Daily Life During Cancer Dealing with cancer is a life-changing event for most people. For many, it can be a time to minimize regrets and make new priorities. Try to live each day as normally as you can. Enjoy the simple things you like to do and take pleasure in big events. Daily Routine Tips on managing your daily life, incorporating fun, humor, and physical activities. Faith and Spirituality What spirituality means to you, how cancer may a ect and change your spirituality and values, and nding comfort and meaning. Going Back to Work Credit: iStock Information and guidance on going back to work, including talking with and relating to others at work, your legal rights, and handling problems at work. You are not your cancer. Although you have to learn how to cope with the disease, you get to decide how you want to live the rest of your life. You can choose to live with hope. 1/1 https://www.cancer.gov/about-cancer/coping/day-to-day

8/31/24, 10:16 PM Coping – Daily Routine - NCI Keep Up with Your Daily Routine If you feel well enough, keep up with your daily routine. This includes: • • • • Going to work Spending time with

family and friends Taking part in activities Going on trips Think about how you want to spend your time and who you like to be with. What makes you happy? What types of things do you enjoy the most? Credit: National Cancer Institute “My cancer made me take a closer look at how I spend my days. I vowed to use my time in ways that were good for me or brought me pleasure.” —Lindsay Have Fun You can still have joy in your life while having cancer. Sometimes people with cancer try new, fun things that they have never done before. For instance, have you always wanted to ride in a hot air balloon or go on a boat cruise? What fun things have you always wanted to try, but have never taken the time to do? Try to do something just for fun, not because you have to do it. But be careful not to tire yourself out. Some people get depressed when they are too tired. Make sure to get enough rest so you feel strong and can enjoy these fun activities. Look for What Makes You Laugh and Smile “Is cancer life-threatening? Yes, but why die mad? So I joked about it all the way through, and I think it helped me.” 1/3 https://www.cancer.gov/about-cancer/coping/day-to-day/daily-routine 8/31/24, 10:16 PM Coping – Daily Routine - NCI —Ari If you like to joke with your friends and family don't stop now. For many people, humor is a way to gain a sense of control. Laughter can help you relax. When you laugh, your brain releases chemicals that produce pleasure and relax your muscles. Even a smile can ght o stressful thoughts. Of course, you may not always feel like laughing, but other people have found that these ideas can help: • • • • • • • Ask people to send you funny cards Enjoy the amusing things children and pets do Watch funny movies or TV shows Listen to comedy recordings and podcasts Buy a funny desk calendar Read humor-related books or articles Check out websites and videos on the Internet. If you don't own a computer, use one at your local library You may even nd that you can laugh at yourself. "I went by to help a friend this summer, and it was really hot, so I took my wig o ," one woman said. "I got ready to go and I couldn't nd it. After searching high and low, I found it hanging from her dog's mouth. But I just stuck it on my head and went home. My husband said, 'What happened?' Needless to say that wig has never been the same." Exercise and Physical Activity Research shows many people nd they have more energy when they take part in physical activities such as swimming, walking, yoga, and biking. They nd that these types of exercise, or anything that gets their body moving, helps to keep them strong and makes them feel good. A bit of exercise every day: • • • • • • Improves your chances of feeling better Keeps your muscles toned Speeds your healing Decreases fatigue Controls stress Increases appetites 2/3 https://www.cancer.gov/about-cancer/coping/day-to-day/daily-routine 8/31/24, 10:16 PM Coping – Daily Routine - NCI • • Decreases constipation Helps free your mind of bad thoughts Even if you have never exercised before, you can start now. Choose something you think you'd like to do, and get your doctor's okay to try it. There are things you can do even if you have to stay in bed. Set Goals to Look Forward to You may nd it helpful to look beyond your treatment and think about what you want to do when you feel well again. Many people set goals so that they can work toward something. For example, they research and plan a trip, or they think about classes and learning things they’ve always meant to learn. They may look forward to going to a wedding or meeting a new grandchild. Updated: August 25, 2023 3/3 https://www.cancer.gov/about-cancer/coping/day-to-day/daily-routine

8/31/24, 10:18 PM Coping – Late Effects - NCI Late Effects of Cancer Treatment Many side e ects from cancer treatment get better once treatment is over. Sometimes, side e ects may linger after

treatment and cause long term problems. And then, there are some problems that may not show up for months or years after you've nished treatment. These problems are called late e ects. This page explains speci c late e ects that may occur after cancer treatment and suggests ways to manage them. To learn about side e ects that may occur during cancer treatment, see Side E ects of Cancer Treatment. What Are Late Effects of Cancer Treatment? The right type and amount of exercise can help keep you healthy. Talk with your doctor about which activities you can safely do. Credit: iStock Late e ects are problems caused by cancer treatment that may not show up for months or years after treatment. These problems are speci c to certain types of treatments and the dose received. Like side e ects that you may have during treatment, late e ects di er greatly from person to person. You may have problems that are very di erent from someone else's, even if they had the same type of cancer and treatment. When you discuss follow-up care with your doctor, you may want to ask about which late e ects to watch for. Early medical attention can prevent or help better manage late e ects. See Follow-Up Medical Care to learn more. Living a healthy lifestyle can help you feel better overall and manage certain late e ects, such as heart and lung problems. See Guidelines for a Healthy Lifestyle to learn more. Finding a Follow-Up Program for Survivors Some cancer centers and hospitals have programs that focus on long-term follow-up care for cancer survivors, including managing late e ects. Many NCI-Designated Cancer Centers and large https://www.cancer.gov/about-cancer/coping/survivorship/late-effects 1/10 8/31/24, 10:18 PM Bone Loss Coping – Late Effects - NCI community treatment centers o er some form of survivorship program or clinic for adults who have been treated for cancer. Also, the cancer education website Oncolink has a searchable database of survivorship clinics across the United States. Chemotherapy, steroid medicines, hormonal therapy, or radiation therapy may cause thinning of the bones. With radiation therapy, bone loss will occur only in the part of the body that was treated. Ways to Manage Once you've had cancer, you should have regular check-ups. During these visits, your doctor or nurse will do a physical exam and may order tests to check your bone health. You can help lower your risk of bone loss by: • • • • not smoking or using other tobacco products eating foods that are rich in calcium and vitamin D walking, jogging, or other weight-bearing exercises limiting how much alcohol you drink If you had radiation to the head and neck, also see Mouth Changes on this page for tips on managing possible bone loss in your jaw. Brain Changes Some chemotherapy drugs and radiation therapy to the brain can cause problems with thinking and behavior months or years after treatment. Late e ects that may occur depend on the part of the brain that was treated and may include: • • • • • • memory loss problems doing math problems concentrating slow processing of information personality changes movement problems 2/10 https://www.cancer.gov/about-cancer/coping/survivorship/late-effects 8/31/24, 10:18 PM Coping – Late Effects - NCI In rare cases, radiation to the brain can cause radiation necrosis. This problem may happen when an area of dead tissue forms at the site of the brain tumor. Radiation necrosis can cause movement problems, problems concentrating, slow processing of information, and headaches. Ways to Manage If you have symptoms of brain changes, you may have tests to see whether they are caused by cancer in the brain or are late e ects of treatment. If you have late e ects, your doctor or nurse: • • • will talk with you about ways to manage these e ects may refer you to a physical, occupational, or speech therapist who can help with brain problems may prescribe medicine or suggest surgery to help with the symptoms See Memory or Concentration Problems to learn more about brain changes caused by cancer treatment. Endocrine System Changes Some cancer drugs and radiation can damage parts of the endocrine system. The endocrine system is a collection of organs and glands that control body functions such as growth, sexual development, reproduction, sleep, hunger, and the way the body uses food. Parts of the endocrine system that may be damaged by cancer treatment include the thyroid, ovaries, and testes. Radiation to the head and neck may damage the thyroid. Radiation to the pelvis may damage the ovaries in women or the testes in men. Problems caused by these changes can develop many years after treatment and may

include early menopause, infertility, underactive thyroid, overactive thyroid, and weight gain. Ways to Manage Early menopause: See Hot Flashes and Night Sweats for more information about managing the symptoms of early menopause. Sexuality and fertility: For information about sexual problems or managing infertility, see: Sexual Health Issues in Women Fertility Issues in Girls and Women Sexual Health Issues in Men Fertility Issues in Boys and Men Thyroid problems: If you develop underactive thyroid, your doctor may prescribe thyroid hormone replacement therapy and closely watch your response to the medication. If you 3/10 https://www.cancer.gov/about-cancer/coping/survivorship/late-effects 8/31/24, 10:18 PM Coping – Late Effects - NCI develop overactive thyroid, treatment may include: • • • • drugs that prevent the thyroid from making hormones radioactive iodine to destroy the thyroid surgery to remove the thyroid beta-blockers to help with symptoms such as a fast heartbeat, anxiety, or shaking Eye Problems Chemotherapy, hormone therapy, immunotherapy, and steroid medicines may increase the risk of cataracts. Cataracts are a problem in which the lens of your eye becomes cloudy. Cataracts can cause: • • • blurred, cloudy, or double vision sensitivity to light trouble seeing at night Some chemotherapy drugs can cause dry eye syndrome. This is a problem in which your eyes do not produce enough tears. Symptoms include feeling as if your eyes are dry or have something in them. Ways to Manage If you are at risk for cataracts, you should have regular visits with an ophthalmologist (a medical doctor who treats eye problems). If cataracts become serious, they can be treated with surgery. In this type of surgery, an eye surgeon will remove the clouded lens and replace it with a plastic lens. You will usually have local anesthesia and be able to go home the same day. If you develop dry eye syndrome, your doctor may prescribe regular treatment with eye drops or ointments. Or they may suggest that you have a procedure to block tear ducts. Blocking the tear ducts prevents tears from draining away which helps keep the eyes moist. Hearing Problems Treatment with certain chemotherapy drugs (in particular, cisplatin and high doses of carboplatin) and high doses of radiation to the brain can cause ringing in the ears (called tinnitus) or hearing loss that begins months or years after treatment. Ways to Manage 4/10 https://www.cancer.gov/about-cancer/coping/survivorship/late-effects 8/31/24, 10:18 PM Coping – Late Effects - NCI See an audiologist. An audiologist is a health care professional trained to nd, assess, and manage problems with hearing, balance, and other issues having to do with the ear. They can also t you for hearing aids or other devices to help with hearing loss. If you had cancer treatment that can cause hearing problems, you should have at least one visit with an audiologist after you have nished the treatment. Depending on the type and dose of cancer treatment that you received, you may need to see an audiologist often. Protect your hearing. Avoid loud noises. Wear earplugs when using loud equipment, such as lawn mowers, leaf blowers, and power washers. Also, wear earplugs during concerts and other loud indoor events. When listening to headphones, be careful not to turn the volume up too high. Watch for signs of hearing loss. Let your doctor know right away if you have ringing in the ears or notice other changes in your hearing. Heart Problems Certain cancer drugs and radiation therapy to the chest may cause heart problems that don’t show up until years after treatment. Drugs that tend to cause heart problems include: • • • • • trastuzumab doxorubicin daunorubicin (Cerubidine) epirubicin (Ellence) cyclophosphamide (Neosar) Heart problems caused by cancer treatment may include: • • A weakening of the heart muscle, known as congestive heart failure. People with this condition may have shortness of breath, dizziness, and swollen hands or feet. Coronary artery disease, which occurs when the small blood vessels that supply blood and oxygen to the heart narrow. People with coronary artery disease may have chest pain or shortness of breath. This problem is more common in those who had high doses of radiation therapy to the chest. Ways to Manage If you have heart problems caused by cancer treatment, your doctor or nurse might suggest that you: 5/10 https://www.cancer.gov/about-cancer/coping/survivorship/late-effects 8/31/24, 10:18 PM Coping – Late Effects - NCI • • • • • • Eat a heart-healthy diet. A heart-healthy

diet includes a variety of fruits, vegetables, and whole grains. It also includes lean meats, poultry, sh, beans, and fat-free or low-fat milk or milk products. Your doctor will probably suggest that you follow a diet low in salt because salt can cause extra uid to build up in your body, making heart problems worse. The American Heart Association has many tips for heart-healthy eating. Lose weight if you're overweight or obese. Carrying extra weight can put added strain on your heart. Work with your health care team to lose extra weight safely. Exercise. The right type and amount of exercise can help keep you and your heart healthy. Talk with your doctor about which activities you can safely do. Quit smoking and avoid using drugs not prescribed by a doctor. Smoking tobacco and marijuana exposes users and those nearby to many harmful substances. Both smoking and taking drugs can make heart failure worse and harm your health. Talk with your doctor about programs and products that can help you quit smoking. Also, try to avoid secondhand smoke. For help to quit smoking, visit Smokefree.gov or call toll-free, 1-800-QUIT-NOW (1-800-784-8669). Get enough rest. To learn more about how to manage sleep problems, see Sleep Problems. Take medicines prescribed by your doctor. Your doctor may prescribe medicines based on the type of heart problem you have, how severe it is, and your response to certain medicines. Taking these medicines is important. Joint Changes Radiation therapy, some chemotherapy drugs, and steroids can cause scar tissue to form in the joints. These problems can lead to loss of motion in joints, such as your jaw, shoulders, hips, or knees. If you receive radiation therapy, these problems will occur only in the part of the body that was treated. Ways to Manage It is important to be aware of early signs of joint problems so these can be addressed before they get worse. These signs include: • • trouble opening your mouth wide pain when you make certain movements, such as reaching over your head or putting your hand in a back pocket Talk with your doctor or nurse. They may refer you to a physical therapist who will assess your joint problems and give you exercises to do. Physical therapy exercises can decrease pain, increase strength, and improve movement. In some cases, your doctor may recommend a knee or hip replacement. 6/10 https://www.cancer.gov/about-cancer/coping/survivorship/late-effects 8/31/24, 10:18 PM Coping – Late Effects - NCI If you had radiation to the head and neck, also see Mouth Changes on this page for tips on managing possible bone loss in your jaw. Lung Problems Chemotherapy and radiation therapy to the chest may damage the lungs, but you might not notice problems until years after treatment. Cancer survivors who received both chemotherapy and radiation therapy to the chest may have a higher risk of lung damage. Lung damage can cause shortness of breath, wheezing, fever, dry cough, congestion, and feeling tired. Tell your doctor if you have any of these symptoms. If you have symptoms of lung damage, you will have tests to see whether they are due to cancer in the lungs or are late e ects of treatment. Ways to Manage Oxygen therapy. If you have serious trouble breathing, your doctor may prescribe oxygen therapy. Oxygen is most often given through nasal prongs or a mask that ts over your mouth and nose. In some cases, you might receive oxygen through a ventilator. Lose weight if you're overweight or obese. Excess weight can make it hard to breathe. Work with your doctor and health care team to lose excess weight safely. Exercise. Talk with your doctor about which activities you can safely do. Quit smoking, don’t vape, and avoid using drugs not prescribed by a doctor. Smoking tobacco or marijuana exposes smokers and those nearby to many harmful substances. Smoking, vaping, and taking drugs can make lung problems worse and harm your health. Talk with your doctor about programs and products that can help you quit smoking. Also, try to avoid secondhand smoke. For help to quit smoking, visit Smokefree.gov or call toll free, 1-800-QUIT-NOW (1-800-784-8669). Take medicines prescribed by your doctor. Your doctor can prescribe medicines to help you relax when it is hard to breathe, relieve discomfort, and treat pain. Some people with lung problems take steroid drugs. Steroids can interfere with the way the body uses speci c nutrients, including calcium, potassium, sodium, protein, and vitamins C and D. If you take steroid pills for lung problems, it is very important to maintain a healthy weight by eating a balanced diet. A healthy diet that includes foods from each

food group can make up for some of the e ects of steroid therapy. To learn more about eating a healthy diet, see Start Simple with MyPlate Today or MyPlate.gov. Lymphedema Lymphedema is a problem in which the lymph uid does not drain as it should, builds up in the tissues, and causes swelling. You may be at risk for lymphedema if part of your lymph 7/10 https://www.cancer.gov/about-cancer/coping/survivorship/late-effects 8/31/24, 10:18 PM Coping – Late Effects - NCI system is damaged during surgery to remove lymph nodes or by radiation therapy to areas with large numbers of lymph nodes. Lymphedema can develop many years after treatment. See the Lymphedema page for more information, tips for managing, and signs to look for. Mouth Changes Radiation therapy to your head or neck and some chemotherapy drugs can cause late side e ects in your mouth. Problems may include dry mouth, cavities, or bone loss in the jaw. Ways to Manage Visit your dentist. You may need to have your teeth checked every 1 to 2 months for at least 6 months after radiation treatment. During this time, your dentist will look for changes in your mouth, teeth, and jaw. Exercise your jaw. Your doctor or nurse may suggest that you open and close your mouth 20 times as far as you can without causing pain, three times a day, even if your jaw isn't sti . Stimulate saliva. Your doctor or nurse may suggest that you drink 8 to 10 cups of liquid per day. Keep a water bottle handy so you can sip throughout the day. You may also nd sucking on sugarless candy or chewing gum helpful. Take good care of your teeth and gums. Floss and use a mouthwash with uoride every day. Brush your teeth after meals and before you go to bed. Also, avoid mouthwashes that contain alcohol. Explore your treatment options. Ask your dentist to contact your radiation oncologist before you have dental or gum surgery. There may be other treatment options besides surgery. Also, most dentists advise that you do not have teeth pulled from the part of your mouth that received radiation. Post-traumatic Stress Finding out you have cancer, having treatment for cancer, and living with cancer can cause extreme feelings that persist and many stressful events that repeat over time. These feelings and events can pile up and cause post-traumatic stress. Symptoms of post traumatic stress can occur at any time, even years after your rst treatment for cancer. Symptoms of post-traumatic stress may include: • • • • frightening thoughts trouble sleeping being distracted feeling hyper 8/10 https://www.cancer.gov/about-cancer/coping/survivorship/late-effects 8/31/24, 10:18 PM Coping – Late Effects - NCI • • • feeling alone losing interest in daily activities feelings of shock, fear, helplessness, or horror If these symptoms cause distress and interfere with daily life, be sure to tell your doctor. Your doctor can refer you to a social worker, therapist, palliative care specialist, or pastoral counselor. These experts can assess your symptoms and suggest treatment, such as relaxation training, counseling, support groups, and certain medicines. For more information about post-traumatic stress and how to cope, see Coping with Cancer, Cancer-Related Post-traumatic Stress, and Adjustment to Cancer: Anxiety and Distress. Second Primary Cancers Cancer treatment can sometimes cause a new cancer many years after you have nished treatment. When a new primary cancer occurs in a person with a history of cancer, it is known as a second primary cancer. Second primary cancer is not the same thing as metastatic cancer, which is when cancer spreads from where it started. Second primary cancers do not occur very often. When they do occur, they are not always caused by cancer treatment. Ways to Manage • • • Talk with your doctor about the types of second cancers you may be at risk for. Have regular check-ups for the rest of your life to check for cancer—the one you were treated for and any new cancer that may occur. Your doctor can suggest tests you may need to look for cancer and how often you should have them. Tell your doctor if you notice any changes in your body that last longer than a few weeks. Clinical Trials for Managing Late Effects To nd clinical trials for managing symptoms and side e ects and improving quality of life, use this advanced search form. Under "Keywords/Phrases," type the speci c treatment or symptom that you are interested in. Under "Trial Type," select the box for "Supportive Care" trials. If you need help ndings trials, contact the Cancer Information Service, NCI's contact center. Related Resources 9/10 https://www.cancer.gov/about-

cancer/coping/survivorship/late-effects 8/31/24, 10:18 PM Coping – Late Effects - NCI Side E ects of Cancer Treatment Updated: August 6, 2021 If you would like to reproduce some or all of this content, see Reuse of NCI Information for guidance about copyright and permissions. In the case of permitted digital reproduction, please credit the National Cancer Institute as the source and link to the original NCI product using the original product's title; e.g., “Late E ects of Cancer Treatment was originally published by the National Cancer Institute.” 10/10 https://www.cancer.gov/about-cancer/coping/survivorship/late-effects

8/31/24, 10:18 PM Coping – life after cancer treatment - NCI Life After Cancer Treatment People who have completed treatment often say that although they were relieved when it ended, they struggled with the transition to a new way of life after cancer treatment. It was like entering another world where they had to adjust to new feelings, changes in support, and di erent ways of looking at their life. For some cancer survivors, even after treatment ends, they continue to have physical problems or emotional issues. And some must have careful monitoring with tests and check-ups to make sure the cancer isn’t returning. Credit: iStock Coping with your new normal after cancer Getting used to life after cancer treatment takes time. Some people feel a little lost, not knowing what to do next. Dealing with the emotions can feel like a roller coaster. You may feel relief, but also feel anxious and worried. Some people feel sad or even have depression. It can take time to recover from treatment. It can also be tough when others think you’re ready to move on when you’re not. You may still: • • • • • • feel tired and not want to do too much be healing from treatment and side e ects feel nervous about seeing your oncologist less often feel uncertain about how to move forward have anxiety about the future are worried that the cancer will come back One of the hardest things after treatment is not knowing what happens next. Those who have gone through cancer treatment describe the rst few months as a time of change. Some think of this as getting used to a "new normal." It's not so much "getting back to normal" as it is nding out what's normal for you now. People often say that life has new meaning or that they look at things di erently. 1/4 https://www.cancer.gov/about-cancer/coping/survivorship/new-normal 8/31/24, 10:18 PM Coping – life after cancer treatment - NCI Your new normal may include: • • • • • • • • di erent plans or goals than ones you made before your cancer diagnosis changes in the way you eat new or di erent sources of support permanent scars on your body having a hard time doing things that used to be easier for you new routines than you had before emotional scars from going through so much concerns about your body image or sexuality You may see yourself in a new way or nd that others don't act the same towards you now. Whatever your new normal may be, give yourself time to adapt to the changes. Take it one day at a time. Coping with fear of cancer recurrence Although the end of cancer treatment may bring some happiness and relief, it may also bring fear and anxiety. Probably the most common fear is that the cancer will come back (a cancer recurrence). This fear is a big source of distress for many people who have had cancer treatment. Getting scans or other follow-up medical tests can make them feel very anxious. Some cancer survivors call this feeling “scanxiety.” Fear of recurrence is normal and often lessens over time. However, even years after treatment, some events may cause you to become worried. Follow-up visits, screenings, certain symptoms, the illness of a loved one, or the anniversary of the date you were diagnosed can all trigger concern. Below are some steps you can take that may help you manage your fears. • Meeting Let your health care team know your concerns. Be honest about the fears of your cancer coming back so they can address your worries. The risk of recurrence di ers in each patient. Your care team can give you the facts about your type of cancer and the chances of recurrence. They can assure you that they’re looking out for

you. the Mental Health Needs of Cancer Survivors Addressing anxiety, depression, and other psychosocial concerns continues to lag. 2/4 https://www.cancer.gov/about-cancer/coping/survivorship/new-normal 8/31/24, 10:18 PM Coping – life after cancer treatment - NCI • • • • • • • Know that it's common for cancer survivors to have fears about every ache and pain. Ask your health care team how long certain side e ects might last. Let them know if you're having a symptom that worries you. You can get advice about whether or not to schedule an appointment. Just having a conversation with them about your symptoms may help calm your fears. And, over time, you may start to recognize certain feelings in your body as normal. Take notes about any symptoms you have. Keep a diary or notebook of symptoms and side e ects as they occur. Also take notes about any emotional issues you are having. Write down questions for your health care team before follow-up visits. Be prepared to tell them what you've been going through since your last check-up or conversation. Ask for a follow-up care plan. A follow-up care plan is a summary of your cancer treatment, along with next steps for your care. Having a plan may give you a sense of control with your health after treatment. See Follow-up Medical Care to learn about your plan and ways to be proactive with your cancer care and health. Talk to a counselor. If you nd that your fears are more than you can handle, ask for a referral for someone to talk to. A counselor or therapist may be able to help you address your anxiety and worries. They will also know if medication could be an option for you. Online or in-person support groups may also be helpful. Keep busy when waiting for test results. Schedule time with friends or family members or get in touch with people you haven't talked to in a while. Or treat yourself to some self-care, such as exercise, meditation, a massage, a manicure, or anything that takes your mind o waiting. Know what services are there for you. Always take steps to be informed about the services in the hospital and the community that are available for you. Many of the same resources and people that were there for you during treatment are still there for you now. Look at what you can control. Some people say that being organized and having plans helps them feel more in control of their lives. Staying involved in your health care, asking questions, keeping your appointments, and making changes in your lifestyle are among the things you can control. Even setting a daily schedule can give you a sense of control. While no one can control every thought, some say that they try not to dwell on the fearful ones but instead do what they can to enjoy the positive parts of life. If you can, try to use your energy to focus on what makes you feel better and what you can do now to stay as healthy as possible. Take care of your mind and body If you can, try to use your energy to focus on wellness and manage stress. Below are some things you can do to take care of your mind and body. 3/4 https://www.cancer.gov/about-cancer/coping/survivorship/new-normal 8/31/24, 10:18 PM Coping – life after cancer treatment - NCI • • • • • • • • • Find ways to help yourself relax. Relaxation exercises have been proven to help people with stress and may help you relax when you feel worried. Meditation and yoga also help reduce stress. (See How to Relax Your Mind and Body.) Talk to others. Sharing your feelings with friends and family may help you feel better and realize that you're not alone. Join a peer support group. Some people say that talking to other cancer survivors with the same kind of cancer has helped them cope with their stress. Check with your hospital social worker to learn about local groups. Or do an online search for groups in your area or for online groups. See Cancer Support Groups for more tips. Exercise. Moderate exercise (examples: walking, biking, swimming) can help reduce anxiety and depression. It also may improve your mood. Eat a healthy diet. Talk to a dietician or nutritionist about the foods you should eat to stay healthy and maintain your strength. Write your feelings down. Writing in a journal or notebook may help you to express your feelings. Many people nd that getting their thoughts on paper helps them to let go of worries and fears. Seek comfort from spirituality. Many survivors have found their faith, religion, or sense of spirituality to be a source of strength. Give back. Some people like to channel their energy by volunteering and helping others. Being productive in this way gives them a sense of meaning and lets them turn their attention on

others. If you would like to help with a cancer-related cause, see the NCI booklet, Facing Forward: Making a Di erence. Take part in clubs, classes, or social gatherings. Being with others may help you focus on things besides cancer and the worries it brings. Related Resources When Cancer Returns Cancer-Related Post-Traumatic Stress (PDQ®)–Patient Version Facing Forward: Making a Di erence in Cancer (22 MB) Updated: May 1, 2024 If you would like to reproduce some or all of this content, see Reuse of NCI Information for guidance about copyright and permissions. In the case of permitted digital reproduction, please credit the National Cancer Institute as the source and link to the original NCI product using the original product's title; e.g., “Life After Cancer Treatment was originally published by the National Cancer Institute.” 4/4 https://www.cancer.gov/about-cancer/coping/survivorship/new-normal

8/31/24, 10:32 PM Drugs Approved for Brain Tumors - NCI Drugs Approved for Brain Tumors This page lists cancer drugs approved by the FDA for use in brain tumors. The drug names link to NCI's Cancer Drug Information summaries. The list includes generic names and brand names. There may be drugs used in brain tumors that are not listed here. Drugs Approved for Brain Tumors Anitor (Everolimus) Anitor Disperz (Everolimus) Alymsys (Bevacizumab) Avastin (Bevacizumab) Belzutifan Bevacizumab BiCNU (Carmustine) Carmustine Carmustine Implant Danyelza (Naxitamab-gqgk) Dabrafenib Mesylate E ornithine Hydrochloride Everolimus Gliadel Wafer (Carmustine Implant) Iwil n (E ornithine Hydrochloride) Lomustine Mekinist (Trametinib Dimethyl Sulfoxide) Mvasi (Bevacizumab) Naxitamab-gqgk Ojemda (Tovorafenib) Ta nlar (Dabrafenib Mesylate) Temodar (Temozolomide) Temozolomide Tovorafenib Trametinib Dimethyl Sulfoxide Voranigo (Vorasidenib Citrate) 1/2 https://www.cancer.gov/about-cancer/treatment/drugs/brain 8/31/24, 10:32 PM Drugs Approved for Brain Tumors - NCI Vorasidenib Citrate Welireg (Belzutifan) Zirabev (Bevacizumab) Drug Combinations Used in Brain Tumors PCV Related Resources Brain Tumors—Patient Version Chemotherapy and You: Support for People With Cancer Updated: August 26, 2024 2/2 https://www.cancer.gov/about-cancer/treatment/drugs/brain

8/31/24, 10:15 PM Emotions and Cancer - NCI Emotions and Cancer Just as cancer a ects your physical health, it can bring up a wide range of emotions you’re not used to dealing with. It can also make existing feelings seem more intense. They may change daily, hourly, or even minute to minute. This is true whether you’re currently in treatment, done with treatment, or a friend or family member. These feelings are all normal. Often the values you grew up with a ect how you think about and cope with cancer. For example, some people: • Credit: iStock feel they have to be strong and protect their friends and families. • • • seek support and turn to loved ones or other cancer survivors. ask for help from counselors or other professionals. turn to their faith to help them cope. Whatever you decide, it's important to do what's right for you and not to compare yourself with others. Your friends and family members may share some of the same feelings. If you feel comfortable, share this information with them. Young people with cancer can also learn more on the Emotional Support for Young People with Cancer page. Overwhelmed When you rst learn that you have cancer, it's normal to feel as if your life is out of control. This could be because: • • • • you wonder if you're going to live. your normal routine is disrupted by doctor visits and treatments. people use medical terms that you don't understand. you feel like you can't do the things you enjoy.

1/9 https://www.cancer.gov/about-cancer/coping/feelings 8/31/24, 10:15 PM Emotions and Cancer - NCI • you feel helpless and lonely. Even if you feel out of control, there are ways you can take charge. It may help to learn as much as you can about your cancer and its treatment. The more you know, the more in control you'll feel. Ask your doctor questions and don't be afraid to say when you don't understand. For some people, it feels better to focus on things other than cancer when they can. If you have the desire and energy, try taking part in things you enjoy such as music, crafts, reading, or learning something new. Fear and Worry It's scary to hear that you have cancer. You may be afraid or worried about: • • • • • • being in pain, either from the cancer or the treatment feeling sick or looking di erent as a result of your treatment taking care of your family paying your bills keeping your job dying Some fears about cancer are based on stories, rumors, or wrong information. To cope with fears and worries, it often helps to be informed. Most people feel better when they learn the facts. They feel less afraid and know what to expect. Some studies even suggest that people who are well-informed about their illness and treatment are more likely to follow their treatment plans and recover from cancer more quickly than those who are not. Stress and Anxiety Both during and after treatment, it's normal to have stress over all the life changes you're going through. Many people get confused or stressed over things such as: • • • • • whether insurance will cover tests and treatment where to nd emotional support how to get help with daily routines how cancer will a ect their work-life getting rides to and from clinic visits 2/9 https://www.cancer.gov/about-cancer/coping/feelings 8/31/24, 10:15 PM Emotions and Cancer - NCI Stress can keep your body from healing as well as it should. It’s important to be proactive and talk about issues such as those above early in treatment. Or have a family member or friend ask for you. For example: • • if you need help with insurance or nancial issues, talk to your health care team so they’re aware of your concerns. Then speak to your hospital billing o ce and ask them for guidance. For more tips, see Managing Cancer Costs and Medical Information. for emotional and practical support, ask your hospital social worker or nurse where to nd resources that can help you. Anxiety means you have extra worry, can't relax, and feel tense. You may notice that you: • • • • • • • • have a rapid heartbeat. have headaches or muscle pains. don't feel like eating. Or you eat more. feel sick to your stomach or have diarrhea. feel shaky, weak, or dizzy. have a tight feeling in your throat and chest. sleep too much or too little. nd it hard to concentrate. If you have any of these feelings, talk to your doctor. Though they are common signs of stress and anxiety, you will want to make sure they aren't due to medicines or treatment. If you're worried about your stress, ask your doctor to suggest a counselor for you to talk to or ask about online or in-person support groups. You could also ask if there's a class you can take that teaches ways to deal with stress. There are also many online classes and apps that help with mind-body exercises, meditation, and other forms of stress reduction. The key is to nd ways to control your stress and not to let it control you. (See Cancer Support Groups.) Hope Once people accept that they have cancer and get into a new routine with treatment, they often feel a sense of hope. There are many reasons to feel hopeful. Millions of people who have had cancer are alive today. Your chances of living with cancer—and living beyond it— are better now than they have ever been before. And people with cancer can lead active lives, even during treatment. Some doctors think that hope may help your body deal with cancer. So, scientists are studying whether a hopeful outlook and positive attitude helps people feel better. Below are 3/9 https://www.cancer.gov/about-cancer/coping/feelings 8/31/24, 10:15 PM Emotions and Cancer - NCI some ways you can build your sense of hope. • • • • • • Plan your days and schedule as you've always done. It may change somewhat but that's okay. As much as you're able, try not to limit the things you like to do. Look for reasons to have hope. If it helps, write them down or talk to others about them. Spend time in nature. Re ect on your religious or spiritual beliefs. Credit: iStock Listen to stories about people with cancer who are leading active lives. Anger It's very normal to ask, "Why me?" and be angry at the cancer. You may also feel anger or resentment towards your health care providers, your healthy

friends, and your loved ones. And if you're religious, you may even feel angry with God. Anger often comes from feelings that are hard to show. Common examples are: • • • • • fear panic frustration anxiety helplessness If you feel angry, you don't have to pretend that everything is okay. It's not healthy to keep it inside you. Sometimes anger can be helpful in the short term, for it may motivate you to take action. But having constant anger or resentment won't feel good to you or the people around you. Talk with your family and friends about your anger. Or, ask your doctor to refer you to a counselor. Sadness and Depression Many people with cancer feel sad. They feel a sense of loss of their health, and the life they had before they learned they had the disease. Even when you're done with treatment, you 4/9 https://www.cancer.gov/about-cancer/coping/feelings 8/31/24, 10:15 PM Emotions and Cancer - NCI may still feel sad. This is a common response to any serious illness. It may take time to work through and accept all the changes that are taking place. When you're sad, you may have very little energy, feel tired, or not want to eat. For some, these feelings go away or lessen over time. But for others, these emotions can become stronger. The painful feelings don't get any better, and they get in the way of daily life. This may mean you have depression, which can be common in some people with cancer. Often people don't realize that depression is a medical condition that can be treated. For some, cancer treatment may have added to this problem by changing the way the brain works. Getting Help for Depression Depression can be treated. Below are common signs of depression. If you have any of the following signs for more than 2 weeks, talk to your doctor about treatment. Be aware that some of these symptoms could be due to physical problems, so it's important to talk about them with your doctor. Emotional signs: • • • • • • • • • • • • • feelings of sadness that don't go away feeling emotionally numb feeling nervous or shaky having a sense of guilt or feeling unworthy feeling helpless or hopeless, as if life has no meaning feeling short-tempered, moody having a hard time concentrating, feeling scatterbrained crying for long periods of time or many times each day focusing on worries and problems no interest in the hobbies and activities you used to enjoy nding it hard to enjoy everyday things, such as food or being with family and friends thinking about hurting yourself thoughts of suicide Body changes: • • • • unintended weight gain or loss not due to illness or treatment sleep problems, such as not being able to sleep, having nightmares, or sleeping too much racing heart, dry mouth, increased perspiration, upset stomach, diarrhea changes in energy level 5/9 https://www.cancer.gov/about-cancer/coping/feelings 8/31/24, 10:15 PM Emotions and Cancer - NCI • • fatigue that doesn't go away headaches, other aches and pains If your doctor thinks that you su er from depression, they may give you medicine to help you feel less tense. Or they may refer you to other experts. Don't feel that you should have to control these feelings on your own. Getting the help you need is important for your life and your health. However, if you have thoughts of suicide, dial 911 in an emergency or call, text, or chat 988 to reach the 988 Suicide and Crisis Lifeline. Counselors are available 24 hours a day, 7 days a week, including services for people who are deaf or hard of hearing. Gratitude Some people see their cancer as a "wake-up call." They realize the importance of enjoying the little things in life. They go places they've never been. They nish projects they had started but put aside. They spend more time with friends and family. They mend broken relationships. It may be hard at rst, but try to look for the joy in your life if you have cancer. Pay attention to the things you do each day that make you smile. They can be as simple as drinking a good cup of co ee, being with a child, or talking to a friend. You can also do things that are more special to you, like being in nature or praying in a place that has meaning for you. Or it could be playing a game you love or cooking a good meal. Whatever you choose, embrace the things that bring you joy when you can. Loneliness People with cancer often feel lonely or distant from others. This may be for a number of reasons such as: • • • • • friends sometimes have a hard time dealing with cancer and may not visit or call you. you feel like no one cares. you may feel too sick to take part in the hobbies and activities you used to enjoy. you don't feel like reaching out. even when you're with people you care about, you may feel that no one

understands what you’re going through. It’s also normal to feel alone after treatment. You may miss the support you got from your health care team. Many people have a sense that their safety net has been pulled away, and 6/9 https://www.cancer.gov/about-cancer/coping/feelings 8/31/24, 10:15 PM Emotions and Cancer - NCI they get less attention. It’s common to still feel cut o from certain friends or family members. Some of them may think that now that treatment is over, you will be back to normal soon, even though this may not be true. Others may want to help but don’t know how. Look for emotional support in di erent ways. It could help you to talk to other people who have cancer or to join a support group that meets in person or online. Or you may feel better talking only to a close friend, family member, counselor, or a member of your faith or spiritual community. Do what feels right for you. Guilt If you feel guilty, know that many people with cancer feel this way. Sometimes people blame themselves for: • • • • • • upsetting the people they love. thinking that they're a burden in some way. missing work. having to spend money on the costs of cancer care. feeling envy of other people's good health and being ashamed of this feeling. making lifestyle choices that they think could have led to cancer. Remember that having cancer is not your fault. No one knows why some people get cancer while others don't. It may help you to share your feelings with someone. Let your doctor know if you would like to talk with a counselor or go to a support group. (See more tips below.) “When I start to feel guilty that I caused my illness, I think of how little kids get cancer. That makes me realize that cancer can just happen. It isn't my fault.” —Becky More Ways to Cope with Your Emotions Express your feelings People have found that when they express strong feelings like anger or sadness, they're more able to let go of them. Some sort out their feelings by talking to friends or family, other cancer survivors, a support group, or a counselor. But even if you prefer not to 7/9 https://www.cancer.gov/about-cancer/coping/feelings 8/31/24, 10:15 PM Emotions and Cancer - NCI discuss your cancer with others, you can still sort out your feelings by thinking about them or writing them down. Don't blame yourself for your cancer Some people believe that they got cancer because of something they did or did not do. But scientists don't know why one person gets cancer and one person doesn't. All bodies are di erent. Remember, cancer can happen to anyone. Don't try to be upbeat if you're not Many people say they want to have the freedom to give in to their feelings sometimes. As one woman said, “When it gets really bad, I just tell my family I'm having a bad cancer day and go upstairs and crawl into bed.” You choose when to talk about your cancer It can be hard for people to know how to talk to you about your cancer. Often loved ones mean well, but they don't know what to say or how to act. If you want to talk, you can make them feel more at ease by asking them what they're thinking or how they're feeling. And if you don't want to talk about it, it's okay to say that too. You can let them know when you're ready to talk. Find ways to help yourself relax Whatever activity helps you unwind, you should take some time to do it. Meditation, guided imagery, and relaxation exercises are just a few ways that have been shown to help others; these may help you relax when you feel worried. Be as active as you can Getting out of the house and doing something can help you focus on other things besides cancer and the worries it brings. Exercise or gentle yoga and stretching can help too. Find hobbies and activities you enjoy You may like hobbies such as knitting, woodworking, pottery, photography, puzzles, reading, or crafts. Or nd creative outlets such as art, movies, music, or dance. Learn how to manage side effects The physical side e ects of cancer can a ect your emotions. Often if our body doesn't feel good, we don't feel good mentally either. For example, if someone is in pain, they might get cranky with others. Or if people are fatigued, it might make them feel sad. To learn about cancer side e ects and ways to control them, see Side E ects of Cancer Treatment. Look at what you can control 8/9 https://www.cancer.gov/about-cancer/coping/feelings 8/31/24, 10:15 PM Emotions and Cancer - NCI Some people say that putting their lives in order helps. Being involved in your health care, asking questions, keeping your appointments, and making changes in your lifestyle are among the things you can control. Even setting a daily schedule can give you a sense of control. And while no one can

control every thought, some say that they try not to dwell on the fearful ones, but instead do what they can to enjoy the positive parts of life. If you can, try to use your energy to focus on what makes you feel better and what you can do now to stay as healthy as possible. Related Resources Taking Time: Support for People with Cancer Facing Forward: Life After Cancer Treatment When Cancer Returns Depression (PDQ®)–Patient Version Adjustment to Cancer: Anxiety and Distress (PDQ®)–Patient Version Cancer-Related Post-Traumatic Stress (PDQ®)–Patient Version Updated: November 9, 2023 If you would like to reproduce some or all of this content, see Reuse of NCI Information for guidance about copyright and permissions. In the case of permitted digital reproduction, please credit the National Cancer Institute as the source and link to the original NCI product using the original product's title; e.g., “Emotions and Cancer was originally published by the National Cancer Institute.” 9/9 https://www.cancer.gov/about-cancer/coping/feelings

8/31/24, 10:15 PM Meditation and Relaxation for Your Mind and Body - NCI How to Relax Your Mind and Body Many people with cancer and their caregivers have found that doing relaxation techniques or practicing meditation and mindfulness has helped them lower stress and cope with anxiety. All are ways people try to calm themselves and feel better. • • Relaxation techniques include muscle tensing and release, breathing exercises, and guided imagery to name a few. In meditation, a person focuses his or her attention on something, such as an object, word, phrase, or breathing. It may help relax Credit: iStock the body and mind and improve overall health and well-being. • Mindfulness is a type of meditation based on the concept of being “mindful,” or having increased awareness of the present. It can be a sitting meditation that’s done in a quiet space. In this practice, you focus on your breathing or sensations in your body. When your mind wanders and thoughts pop into your head, you try to return your mind to the present moment. Being mindful doesn’t have to be done sitting still or in silence. Some people like to do a walking meditation either outside or inside. You can also blend mindfulness into the things you do every day, like waiting in line, sitting at a bus stop, or eating. You can also be mindful while being with others. Take the time to learn how to relax your mind and body. You could start with the exercises below and practice them when you can. Even doing just 5 or 10 minutes may help you feel better. You can also take a class, nd videos on YouTube, buy a relaxation DVD or recording, or nd other exercises online. There are also many online programs and apps for doing meditation. Be careful to only use well-known sources or those from medical schools or universities. Getting Started with Relaxation Techniques For each exercise, nd a quiet place where you can rest undisturbed. Let others know you need time for yourself. Make the setting peaceful for you. For example, dim the lights and nd a comfortable chair or couch. 1/4 https://www.cancer.gov/about-cancer/coping/feelings/relaxation 8/31/24, 10:15 PM Meditation and Relaxation for Your Mind and Body - NCI You may nd that your mind wanders, which is normal. When you notice yourself thinking of something else, gently direct your attention back to your body. Be sure to maintain your deep breathing. Some people like to listen to slow, familiar music while they practice these exercises. Breathing and muscle tensing • • • • Get into a comfortable position where you can relax your muscles. Close your eyes and clear your mind of distractions. You can sit up or lie down. If you’re lying down, you may want to put a small pillow under your neck and knees. Breathe deeply, at a slow and relaxing pace. Concentrate on breathing deeply and slowly, raising your belly with each breath, rather than just your chest. Next, go through each of your major muscle groups, tensing (squeezing) them for a few seconds and then letting go. Start at the top of your head and work your way down. Tense and relax your face and jaws, then shoulders and arms. Continue tensing and relaxing each muscle group as Virtual Mind–Body Fitness Classes May Offer Benefits during

Cancer Treatment In a clinical trial, participating in the classes reduced the risk of being hospitalized. you go down (chest, lower back, buttocks, legs), ending with your feet. Focus completely on releasing all the tension from your muscles and notice the di erences you feel when they are relaxed. • When you are done, focus on the pleasant feeling of relaxation for as long as you like. Slow rhythmic breathing • • • • • • Stare at an object or shut your eyes and think of a peaceful scene. Take a slow, deep breath. As you breathe in, tense your muscles. As you breathe out, relax your muscles and feel the tension leaving. Remain relaxed and begin breathing slowly and comfortably, taking about 9 to 12 breaths a minute. To maintain a slow, even rhythm, you can silently say to yourself, “In, one, two. Out, one, two." If you ever feel out of breath, take a deep breath, and continue the slow breathing. Each time you breathe out, feel yourself relaxing and going limp. Continue the slow, rhythmic breathing for up to 10 minutes. To end the session, count silently and slowly from one to three. Open your eyes. Say to yourself, “I feel alert and relaxed.” Begin moving slowly. 2/4 https://www.cancer.gov/about-cancer/coping/feelings/relaxation 8/31/24, 10:15 PM Meditation and Relaxation for Your Mind and Body - NCI Imagery Note: You may want to read this out loud and record it so you can follow along as you do the exercise. Or you could ask a friend to record it if you would rather not hear your own voice. You could also just read the exercise over a few times to remember the main tips. Imagery usually works best with your eyes closed. To begin, create an image in your mind. For example, you may want to think of a place or activity that made you happy in the past. Explore this place or activity. Notice how calm you feel. If you have severe pain, you may imagine yourself as a person without pain. In your image, cut the wires that send pain signals from one part of your body to another. Or you may want to imagine a ball of healing energy. Others have found the following exercise to be very helpful: • • • • • Close your eyes and breathe slowly. As you breathe in, say silently and slowly to yourself, “In, one, two,” and as you breathe out, say “Out, one, two.” Do this for a few minutes. Imagine a ball of healing energy forming in your lungs or on your chest. Imagine it forming and taking shape. When you’re ready, imagine that the air you breathe in blows this ball of energy to the area where you feel pain. Once there, the ball heals and relaxes you. You may imagine that the ball gets bigger and bigger as it takes away more of your discomfort. As you breathe out, imagine the air blowing the ball away from your body. As it oats away, all of your pain goes with it. Repeat the last two steps each time you breathe in and out. To end the imagery, count slowly to three, breathe in deeply, open your eyes, and say silently to yourself, “I feel alert and relaxed.” For more information, see: Meditation and Mindfulness: What You Need to Know Mindfulness for Your Health Music and Health Relaxation Techniques for Health Yoga: What You Need to Know Updated: April 11, 2024 If you would like to reproduce some or all of this content, see Reuse of NCI Information for guidance about copyright and permissions. In the case of permitted digital reproduction, please credit the National Cancer Institute as the source and link to the original NCI product using the 3/4 https://www.cancer.gov/about-cancer/coping/feelings/relaxation 8/31/24, 10:15 PM Meditation and Relaxation for Your Mind and Body - NCI original product's title; e.g., “How to Relax Your Mind and Body was originally published by the National Cancer Institute.” 4/4 https://www.cancer.gov/about-cancer/coping/feelings/relaxation

8/31/24, 10:20 PM Questions to Ask Your Doctor When You Have Finished Treatment - NCI Questions to Ask Your Doctor When You Have Finished Treatment When you have nished your cancer treatment, you will talk with your doctor about next steps and follow-up care. You may want to ask your doctor some of the following questions: • • • • • • • • • • • How long will it take for me to get better and feel more like myself? What kind of care should I expect after my treatment? What long-

term health issues can I expect as a result of my cancer and its treatment? What is the chance that my cancer will return? What symptoms should I tell you about? Who do I call if I develop these symptoms? What can I do to be as healthy as possible? Which doctor(s) should I see for my follow-up care? How often? What tests do I need after treatment is over? How often will I have the tests? What records do I need to keep about my treatment? Is there a counselor I can talk to or an online or in-person support group you can suggest? Related Resources Follow-Up Medical Care Facing Forward: Life After Cancer Treatment Updated: April 11, 2022 1/1 https://www.cancer.gov/about-cancer/coping/survivorship/questions