

**BLOOD CANCER 101: UPDATE ON DISEASE,
TREATMENT, AND THE ROLE OF THE
HEALTHCARE PROVIDER**

March 9, 2021



WELCOME AND INTRODUCTIONS



Lauren Berger, MPH

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LEARNING OBJECTIVES

- Describe the different blood cancers
- Describe the psychosocial impact of different blood cancer diagnoses
- Explain the role of the social worker and nurse as members of the healthcare team
- Educate patients about clinical trial participation
- List resources for patients with blood cancers and how to access them

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SPEAKERS



**Lynn Steele,
LSW, OSW-C**



**Laura Romundstad,
CRNP, MSN, RN**

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WHAT IS BLOOD CANCER?

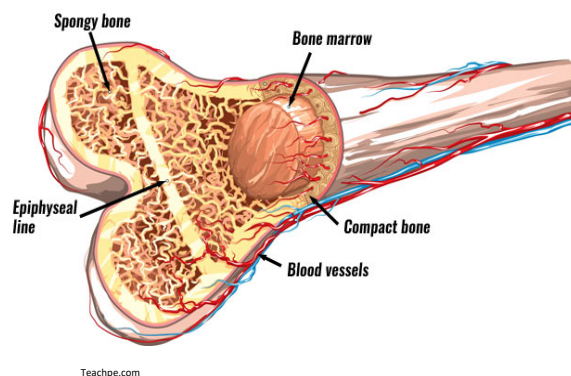
- Cancer arising from cells responsible for blood formation or immune function
- Commonly occurs in your bone marrow where stem cells are located and mature
- In the bone marrow, normal cell production is interrupted and abnormal cells begin to grow

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WHAT IS BONE MARROW?



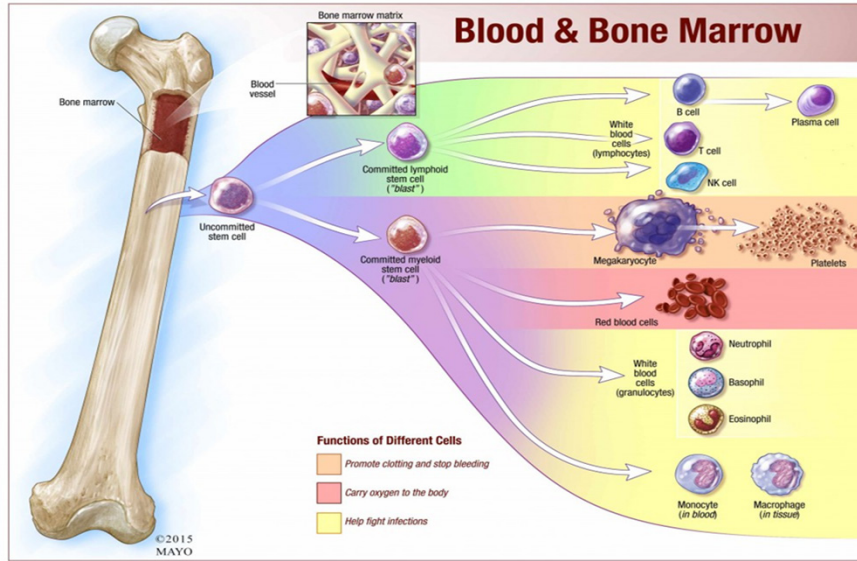
- Bones are made up of 3 main parts:
 - Compact bone
 - Spongy bone
 - Bone marrow
 - Red marrow
 - Yellow marrow

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UNDERSTANDING BLOOD CELL FORMATION



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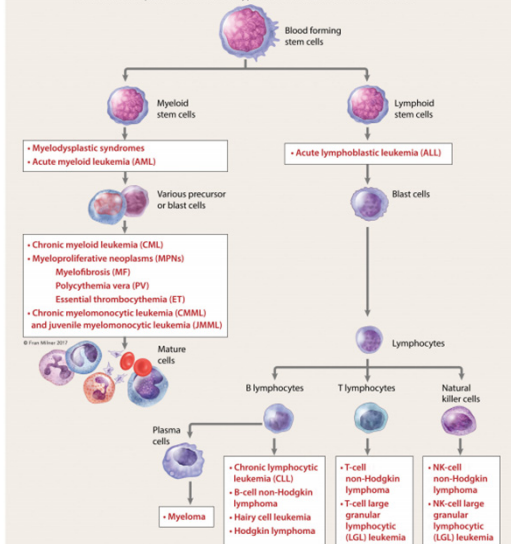
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Where do Blood Cancers Develop?

Blood cancers can develop in many different places within normal blood cell formation.

The type of blood cancer that results has to do with where normal cell development is blocked. This picture shows the cell type where different blood cancers arise.



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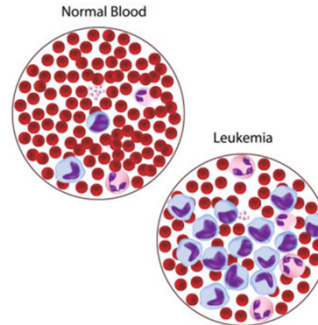
Please reach out to our Information Specialists for more information about this and other disease, treatment, and support concerns at 800.955.4572 or www.LLS.org/InformationSpecialists.



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LEUKEMIA BASICS

- Four main types
 - Acute Lymphoblastic (Lymphocytic) Leukemia (ALL)
 - Acute Myeloid (Myelogenous) Leukemia (AML)
 - Chronic Lymphocytic Leukemia (CLL)
 - Chronic Myeloid Leukemia (CML)
- All begin in the bone marrow
 - Myeloid stem cell line
 - Lymphoid stem cell line
- ALL and AML are made of immature blasts
- CLL and CML have few to no blasts
- Each major type has its own subtypes



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MYELODYSPLASTIC SYNDROMES (MDS)

- Sometimes called “pre-leukemia”; affects myeloid cell line, where 5-19% blasts are present
- Risk factors
 - Male gender, white
 - Older age (70+, typically)
 - No risks known for de novo MDS
 - Secondary MDS may be due to previous cancer treatment
- Symptoms
 - Possible to have none
 - Cytopenias (anemia, neutropenia, thrombocytopenia)

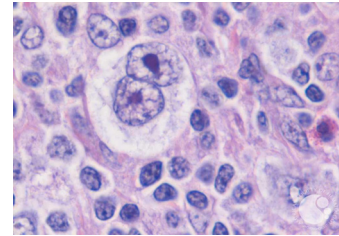
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LYMPHOMA BASICS

- **Hodgkin Lymphoma (HL)**
 - Classical Hodgkin Lymphoma (95%)
 - Nodular Lymphocyte Predominant Hodgkin Lymphoma (5%)
- **Non-Hodgkin Lymphoma (NHL)**
 - B-cell lymphomas ~85% of all NHLs
 - T-cell and NK-cell lymphomas ~15% of all NHLs
 - 70–90 subtypes
 - Aggressive or indolent, sometimes intermediate
 - Stage I–IV



ASH Image Bank

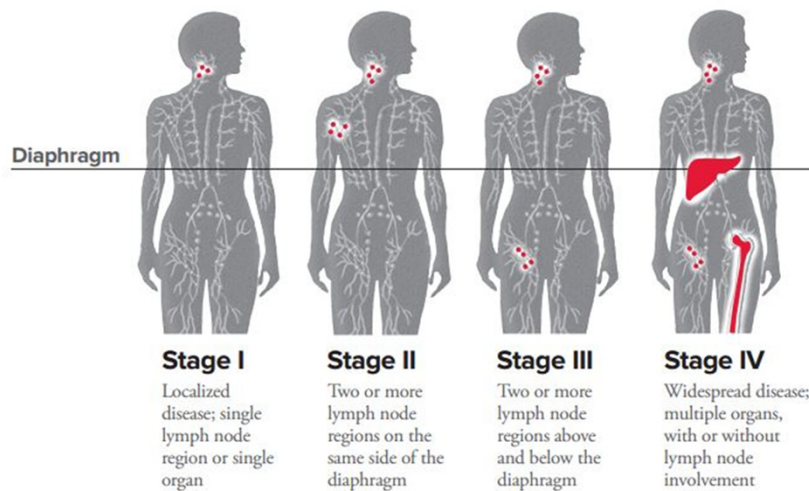
Reed-Sternberg cell

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LYMPHOMA STAGING



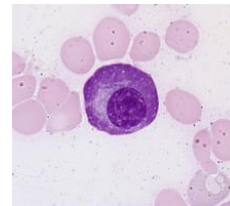
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MYELOMA BASICS

- Cancer of the plasma cells (product of B lymphocytes)
- Can be a single tumor – “plasmacytoma,” asymptomatic and slow growing – “smoldering,” or diffuse throughout the body – “multiple myeloma”
- **CRAB** criteria are important to the diagnosis:
 - **C**alcium is increased
 - **R**enal (kidney) failure or insufficiency
 - **A**nemia
 - **B**one lesions



Blood Journal

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MYELOPROLIFERATIVE NEOPLASMS (MPNS)

- **Myelo** – of the bone marrow; **Proliferative** – to grow or reproduce quickly; **Neoplasm** – abnormal growth of cells
- Many subtypes, but three are considered “classic”:
 - **Polycythemia vera (PV)** – too many red blood cells are made
 - **Essential Thrombocythemia (ET)** – too many platelets are made
 - **Myelofibrosis (MF)** – scarring of the bone marrow after it has “exhausted” itself or as a primary disease

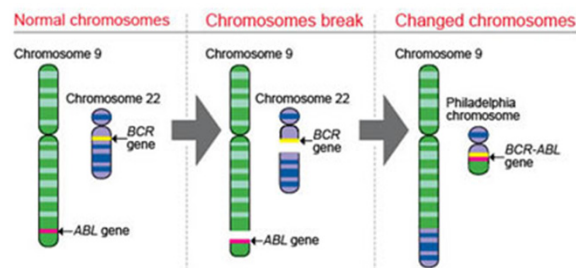
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CANCER MOLECULAR PROFILING

- Identifies DNA, RNA, or protein molecules associated with certain diseases
- Examples of types of tests:
 - Immunohistochemistry/Flow cytometry - antibodies/antigens
 - FISH - Fluorescence in situ Hybridization
 - NGS - Next-Generation Sequencing
 - qPCR - Quantitative Polymerase Chain Reaction



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HOW IS BLOOD CANCER TREATED?

- Chemotherapy
- Radiation Therapy
- Targeted Therapy
- Immunotherapy
- Cellular Therapy
- Clinical Trial
- Palliative Care

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HOW IS BLOOD CANCER TREATED?

Treatment varies greatly based on key factors:

- **What type of blood cancer**
 - Leukemia vs. Lymphoma
 - Acute vs. Chronic
 - Myeloid vs. Lymphoid
- **Molecular/genetic changes?**
 - BCR/ABL mutation (Philadelphia chromosome) - CML, ALL
 - FLT3, IDH1/2
- **Comorbidities of patient**
 - Heart, kidney, liver function OK to withstand chemotherapy

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CHEMOTHERAPY

Stops the growth of dividing cells

- **Used in combinations to make other treatments more effective**
- **Can be used with surgery or radiation**
- **Can be given by many different routes**
 - PO, IV, IM, IT, IP

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Cancerresearchuk.org



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CHEMOTHERAPY SIDE EFFECTS

- Fatigue
- Alopecia
- Neuropathy/Confusion
- Mouth sores
- Nausea/Diarrhea
- Cytopenias - Neutropenia, Anemia, Thrombocytopenia
 - Infection
 - Bleeding
- Skin and nail changes
- Mood changes
- Infertility and changes in libido

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RADIATION THERAPY

Works by damaging DNA of cancer cells so that they cannot replicate

- Types
 - Internal: put inside the target, ie: brachytherapy
 - External: comes from a machine, targets certain area of your body
- Used in combination with chemotherapy and surgery

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RADIATION THERAPY SIDE EFFECTS

- **Fatigue**
- **Localized skin changes**
- **Specific side effects related to the area being treated:**
 - **Lung: fatigue, SOB, cough**
 - **Brain: fatigue, hair loss, nausea/vomiting**
 - **GI: nausea/vomiting, diarrhea, abdominal pain, bladder, fertility**
 - **Head/neck: sore throat, dry mouth, taste alteration, hair loss**

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TARGETED THERAPY

Specifically targets the changes found in cancer cells' DNA which makes it become cancerous

- **Types:**
 - **Monoclonal antibodies**
 - **Cancer growth inhibitors:**
 - **Tyrosine kinase inhibitors: dasatinib, imatinib, nilotinib**
 - **Proteasome inhibitors: bortezomib**
 - **PI3K inhibitors: idelalisib**
 - **HDAC inhibitors: panobinostat, vorinostat**
 - **mTOR inhibitors: sirolimus, everolimus**
 - **Hedgehog pathway inhibitors: glasdegib**

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TARGETED THERAPY SIDE EFFECTS

- Diarrhea
- Liver abnormalities- increased LFTs, hepatitis
- Skin and nail changes
- High blood pressure
- Alterations in blood clotting

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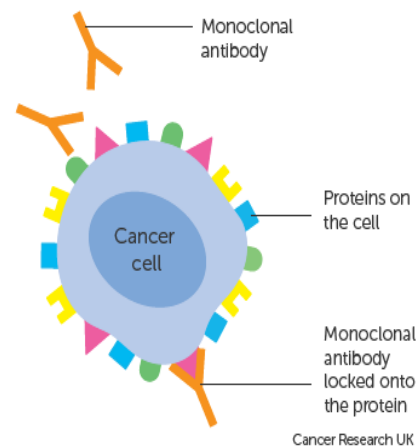


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IMMUNOTHERAPY

Harnesses your immune system to fight the cancer

- **Types:**
 - **Monoclonal or Bispecific antibodies**
 - Rituximab, Obinutuzumab
 - Blinatumomab
 - **Checkpoint inhibitors**
 - Nivolumab, pembrolizumab
 - **Vaccines**
 - Antigen, whole cell, dendritic cell
 - **Cytokines**
 - Interferon and interleukin



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IMMUNOTHERAPY SIDE EFFECTS

- Fever/chills
- Weakness/fatigue
- Blood pressure abnormalities
- Shortness of breath
- Nausea/vomiting
- Swelling/fluid retention
- Organ inflammation
 - Colitis
 - Hepatitis
 - Pneumonitis

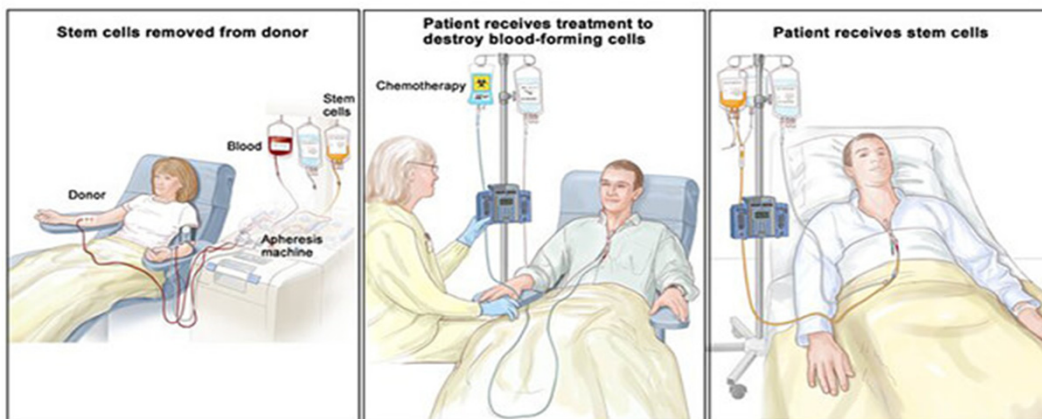
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CELLULAR THERAPY

- Hematopoietic Stem Cell Transplant
- Adoptive Cell Therapy



Credit: National Cancer Institute

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HEMATOPOIETIC STEM CELL TRANSPLANT

- Allows patient to receive high doses of chemotherapy to eradicate disease but then recover normal hematopoietic cell function
- Types:
 - Autologous
 - Allogeneic
 - Umbilical Cord Blood

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ADOPTIVE CELL THERAPY

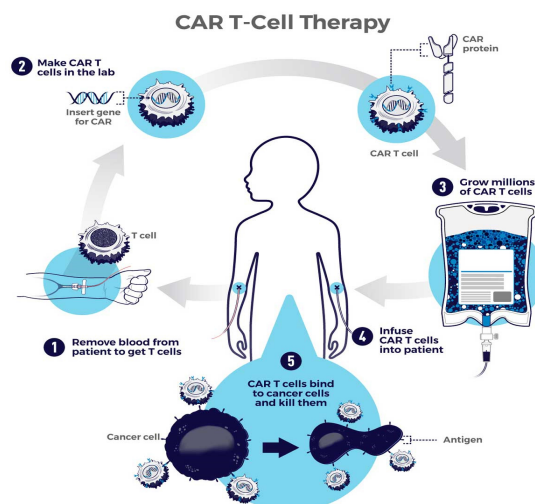
- Therapies that use body's own defense system to fight cancer
 - Tumor-infiltrating lymphocytes (TILs)
 - Penetrate the environment around the tumor
 - Mostly used in solid tumor
 - T-cell receptors (TCRs)
 - T cells engineered to express a specific T-cell receptor which can recognize cancer antigens
 - Mostly used in solid tumor
 - Chimeric Antigen Receptor T cells (CAR T)
 - T cells taken from patient, engineered to produce chimeric antigen receptors and then injected back into the patient which then recognizes specific antigen on tumor cells

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CHIMERIC ANTIGEN RECEPTOR T-CELL THERAPY



CAR T-cell therapy is a type of treatment in which a patient's T cells are genetically engineered in the laboratory so they will bind to specific proteins (antigens) on cancer cells and kill them. (1) A patient's T cells are removed from their blood. Then, (2) the gene for a special receptor called a chimeric antigen receptor (CAR) is inserted into the T cells in the laboratory. The gene encodes the engineered CAR protein that is expressed on the surface of the patient's T cells, creating a CAR T cell. (3) Millions of CAR T cells are grown in the laboratory. (4) They are then given to the patient by intravenous infusion. (5) The CAR T cells bind to antigens on the cancer cells and kill them.

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cancer.gov

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CAR T-CELL THERAPY SIDE EFFECTS

- **Cytokine release syndrome (CRS)**
 - T cells naturally release cytokines, however in CRS there is a massive amount released which caused fever, hypotension
 - Anti-IL6 antibody: tocilizumab
- **Neurotoxicity**
 - Confusion, headache, seizure, cerebral edema
- **B cell aplasia**
 - Normal B cells often killed by infused CAR T cells since they express same targets
 - Patients will go on to receive immunoglobulin therapy

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Credit:
Cancer.gov

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ADOPTIVE CELL THERAPY

- Since 2017, there have been three approved CAR T-cell products
 - Yescarta (axicabtagene ciloleucel)
 - Kymriah (tisagenlecleucel)
 - Tecartus (brexucabtagene autoleucel)
- Adoptive-cell therapy continues to be highly studied with many new and exciting therapies coming down the pipeline

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CLINICAL TRIALS

- Carefully controlled research studies conducted by doctors to improve the care and treatment of people with cancer or other illnesses
- Key step in advancing all cancer treatments
- Cancer clinical trials are 40–50% of all trials conducted in the US
- Trials available for all stages of cancer journey - newly diagnosed, relapsed/refractory
- Can be very difficult to navigate available trials

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RISKS & BENEFITS OF CLINICAL TRIALS

Benefits

- Contribution to present and the future
- Financial access to new treatments
- Early access to new therapies
- Access to physicians with extensive experience in the type of cancer
- Followed closely

Risks

- Possibility the treatment may not work
- Unknown/fear of side effects
- Randomized trials - risk of being in the standard of care arm
- Increase time away from home, work and family

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ONCOLOGY NURSES ROLE WITH BLOOD CANCER PATIENTS AND CAREGIVERS

What to discuss with the patient and caregiver before and throughout treatment

- **Disease and Treatment Education**
 - Understand specifics of disease
 - Learn patient wishes and goals of care
 - Be the patient advocate
- **Fertility – treatment implications, preservation**
- **Potential Side Effects**
 - Recognize adverse effects of treatment and **stress the importance of communicating with the healthcare team**
 - What are “normal” side effects and what needs immediate attention
 - What to do for fever and emergency management
 - 24-hour access to providers - who to contact and best method of communication

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ONCOLOGY NURSES ROLE WITH BLOOD CANCER PATIENTS AND CAREGIVERS

What to discuss with the patient and caregiver before and throughout treatment

■ Nutrition

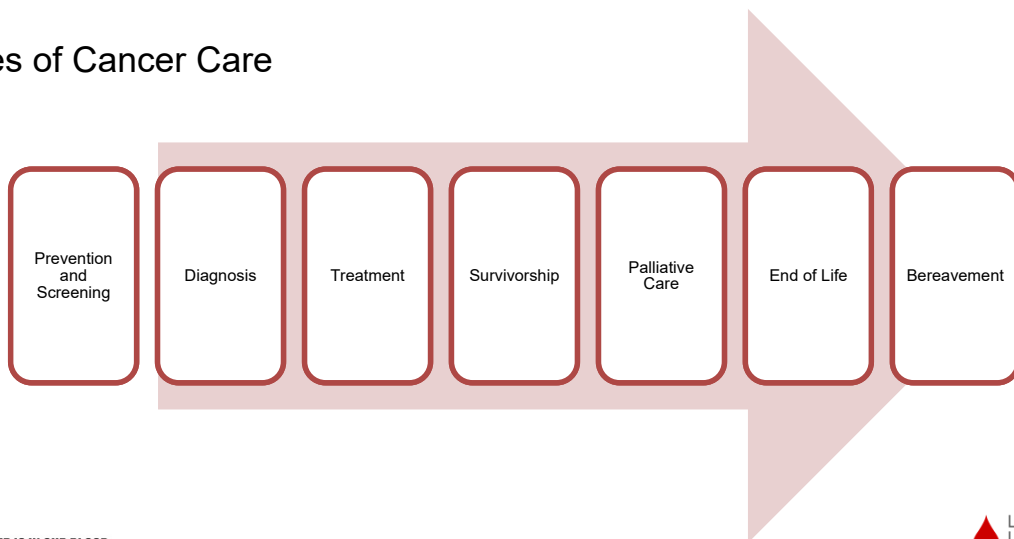
- Food safety guidelines are key
- Small, frequent mini-meals and smart snacks
- Real Food > Supplements
- Eat a variety of foods
- Be open to new foods, flavors and tastes
- Keep a stable body weight
- Stick to what you know
- Ask about any dietary restrictions
- Discuss side effects and changes in appetite/intake
- Use trusted sources of oncology nutrition information
- Ask for a referral to an oncology registered dietitian

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ONCOLOGY SOCIAL WORKER'S ROLE WITH BLOOD CANCER PATIENTS AND CAREGIVERS

Phases of Cancer Care



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PSYCHOSOCIAL CONSIDERATIONS WHEN WORKING WITH ONCOLOGY PATIENTS AND THEIR CAREGIVERS

- **Physical concerns**
 - Diagnosis, physical symptoms or side effects, fertility planning, intimacy, and treatment planning
- **Emotional concerns**
 - Stress, fear, worry, anxiety, anger, frustration
- **Financial concerns**
 - Insurance, medical and prescription costs, employment, daily living expenses
- **Practical concerns**
 - Transportation, housing, childcare, school, daily tasks

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WHAT TO CONSIDER: PSYCHOSOCIAL NEEDS

- **For the patient:**
 - Awareness of ethnic, cultural, and spiritual beliefs
 - May live alone, be unable to care for self or others
 - Concerns about how their cancer affects family members
 - Financial and employment concerns
 - Physical and cognitive side effects of treatment
 - May be predisposed to or develop mental health concerns
 - Emotional concerns
 - Self-care practices and positive coping strategies

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WHAT TO CONSIDER: **PSYCHOSOCIAL NEEDS**

- **For the caregiver:**
 - Awareness of ethnic, cultural, and spiritual beliefs
 - Balancing employment and caregiver roles
 - Balancing family responsibilities
 - Traveling for treatment
 - May be predisposed to or develop mental health concerns
 - Emotional concerns
 - Self-care practices and positive coping strategies

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RELIABLE RESOURCES

- The Leukemia & Lymphoma Society – LLS.org
- National Cancer Institute – cancer.gov
- American Cancer Society – cancer.org
- CancerCare – cancercare.org
- Cancer Support Community – cancersupportcommunity.org
- Triage Cancer – Triagecancer.org
- PubMed.gov
- OncLive.com

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WHAT TO CONSIDER: **CANCER & COVID-19**

- The Pandemic has brought on many concerns for all; even more for cancer patients. Fears are multiplied for immunocompromised patients and those undergoing treatments. Encourage patients to ask their doctor specific concerns; many factors need to be considered and the doctor would have information to determine next steps.
- LLS offers support and guidance for blood cancer patients and caregivers to navigate both cancer & COVID-19.
- COVID-19 and blood cancer related updates and support resources on the LLS website:
 - <https://www.lls.org/public-health/coronavirus>
 - <https://www.cdc.gov/coronavirus/2019-ncov/index.html>
 - <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/index.html>

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Resources for HCPs

- ❑ Free CME & CE courses: www.LLS.org/CE
- ❑ Fact Sheets for HCPs: www.LLS.org/CE
- ❑ Podcast series for HCPs – www.LLS.org/CE
- ❑ HCP Patient Referral Form: www.LLS.org/HCPreferral
- ❑ LLS Other Helpful Organizations: www.LLS.org/OHO

Clinical Trials and Research

- ❑ Clinical Trials: Learn more about clinical trials: www.LLS.org/ClinicalTrials
- ❑ Research: Focused on finding cures and driving research: www.LLS.org/Research

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Resources for Patients

- ❑ Telephone and Web Education Programs: www.LLS.org/Programs & www.LLS.org/Educationvideos
- ❑ Information Booklets: www.LLS.org/Booklets
- ❑ Free Mobile Apps: *LLS Health Manager*: www.LLS.org/Health-Manager
- ❑ Support Resources: www.LLS.org/Support
 - LLS Regions
 - Online Chats
 - One-On-One Nutrition Consultations (PearlPoint)
 - LLS Community (social media platform)
 - Patti Robinson Kaufman First Connection Program (peer-to-peer)
- ❑ Financial Assistance
 - Co-Pay Assistance
 - Urgent Need
 - Travel Assistance
 - Referral to Medication Access programs

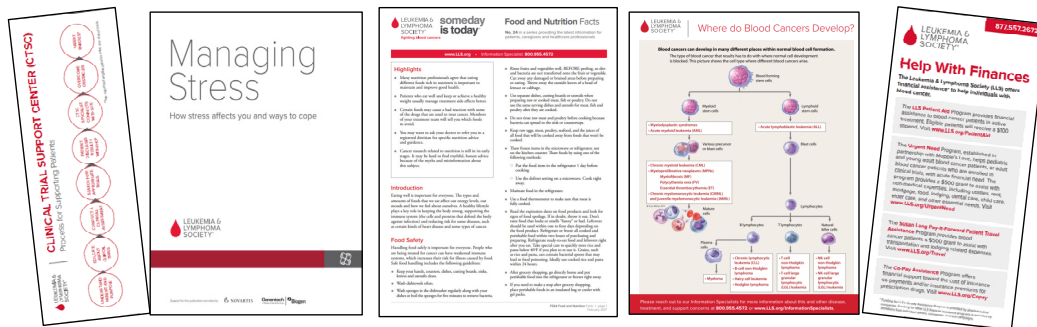
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FREE GUIDES, BOOKLETS, AND FACT SHEETS For Patients, Caregivers and Professionals

www.LLS.org/Booklets



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Resources for Patients


- ❑ **Information Specialists** – Personalized assistance for managing treatment decisions, side effects, and dealing with financial and psychosocial challenges.
- ❑ **Clinical Trial Nurse Navigators** – RNs navigate patients to find an appropriate clinical trial and sift through the information.
- ❑ **Registered Dieticians** – (LLS) provides [PearlPoint Nutrition Services®](#) to patients/caregivers of all cancer types, free nutrition education and one-on-one consultations by phone or email.
- ❑ **Reach out Monday–Friday, 9 am to 9 pm ET**
 - Phone: (800) 955-4572
 - Live chat: www.LLS.org/InformationSpecialists
 - Email: infocenter@LLS.org


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Q & A

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