Advances in Cancer Treatment

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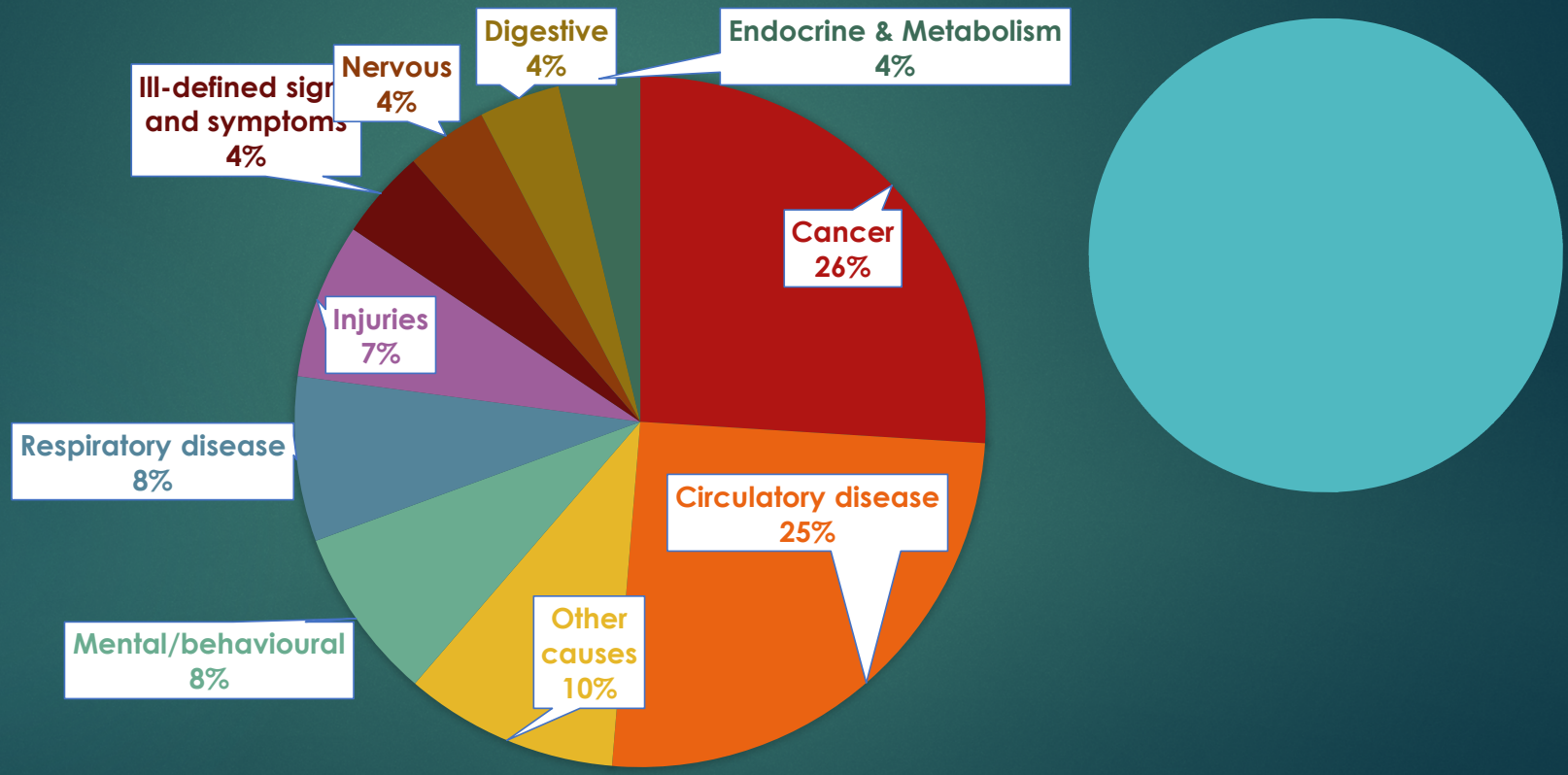
OCTOBER 22, 2024

Deaths in Manitoba 2019/2020



Manitoba Health Provincial Information Management and Analytics, "Annual Statistics 2020-2021".

Most Common Cancer Diagnosis, 2020

Male		Female		Total	
SITE	CASES	SITE	CASES	SITE	CASES
Prostate	913	Breast	911	Lung & bronchus	926
Lung & bronchus	463	Lung & bronchus	465	Breast	916
Colorectal	419	Colorectal	328	Prostate	913
Kidney	175	Corpus uteri	262	Colorectal	747
Non-Hodgkin Lymphoma	160	Non-Hodgkin Lymphoma	152	Non-Hodgkin Lymphoma	312
Melanoma of the skin	155	Pancreas	118	Melanoma of the skin	271
Bladder	113	Melanoma of the skin	116	Corpus uteri	262
Pancreas	94	Thyroid	101	Kidney	262
Multiple myeloma	73	Ovary	95	Pancreas	212
Stomach	70	Kidney	87	Bladder	142

Department of Epidemiology and Cancer Registry, CancerCare Manitoba. "Cancer in Manitoba, 2020 Annual Statistical Report."

Statistics

GOOD NEWS

- Long-term survival from cancer is increasing
- Cancer survivors are growing
- 5 year and more disease-free survival rates for early-stage breast, colorectal, prostate, thyroid and kidney cancer are over 90%
- Early-stage melanoma, Hodgkin lymphoma, cancers of the bladder, uterine corpus, cervix and testes have excellent survival outcomes.
- Immunotherapy and improvements in targeted therapies have contributed to 5-year survival rates for advanced cancers

BAD NEWS

- As people live longer after treatment for cancer, late effects that may persist for 20 years
  - Cognitive, physical, psychosocial adjustment and functional decline
- Treatments applied may precipitated new chronic conditions or exacerbate existing ones
- Cancer survivors are at increased risk for secondary cancer development

Cancer Prevention

How Cancer is Diagnosed

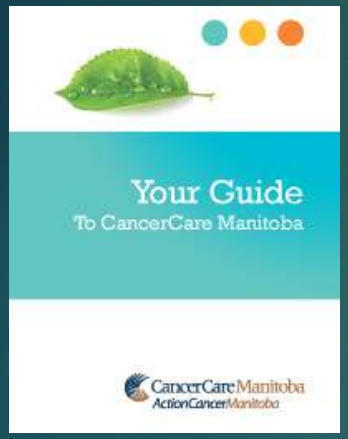
1. Screening tests in Manitoba
   - In Manitoba we have Colon Check, **Breast Check** and **Cervix Check**
     - Colon Check offers screening to people age 50-74 with a fecal immunochemical test (FIT) every two years
       - 75-85 years are not recommended to have a FIT but screening to be continued on a case-by-case basis with consideration for life expectancy, family history, past screening history, comorbidities and potential benefits and harms of screening
       - If first degree relative diagnosed with colorectal cancer before 60 years of age OR two or more first-degree relatives diagnosed at any age colonoscopy every 5 years beginning at age 40 or 10 years earlier than youngest relatives age at diagnosis
       - Personal history of colorectal cancer OR high-risk adenomas requiring surveillance, inflammatory bowel disease with associated colitis OR confirmed or suspected hereditary colorectal cancer syndromes such as Lynch syndrome of familial adenomatous polyposis (FAP)
     - Breast check offers screening mammograms for those age 50-74
     - Cervix Check offers screening for most people with a cervix age 21-69 who have ever had sexual contact should have a Pap test every 3 years.
2. Symptom that suggests cancer
   - Health Care Provider will ask personal and family medical history
   - Physical exam
   - Lab tests (blood, urine or other body fluids)
   - Imaging tests (CT scan, MRI, Bone Scan, PET scan, ultrasound, x-ray
   - Biopsy of tissue

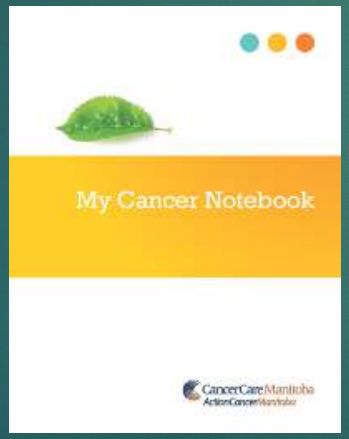
Current Suspect Pathways by Disease Site Group

- Breast Cancer
- Colon or Rectal Cancer
- Hematology
- Lung Cancer
- Lymphoma
- Neck Mass
- Prostate Cancer

Evidence-based guidelines for physicians and nurse practitioners to provided clinical guidance on the work-up of suspected cancer and to demonstrate the most effective and efficient way for patients to get a diagnosis and treatment or to have cancer ruled out.

CancerCare Manitoba
ActionCancerManitoba





Cancer Care Team

- Nurse Navigator
- Hematologist
- Oncologist
- Clerk
- Clinical Assistants/ Physician Assistants
- Clinical Trials Unit
- Counsellor-Psychosocial Oncology clinician
- Dietitian
- Education and Liaison Nurse
- Family Physician or Nurse Practitioner in Oncology (FPO)
- Laboratory Technologist

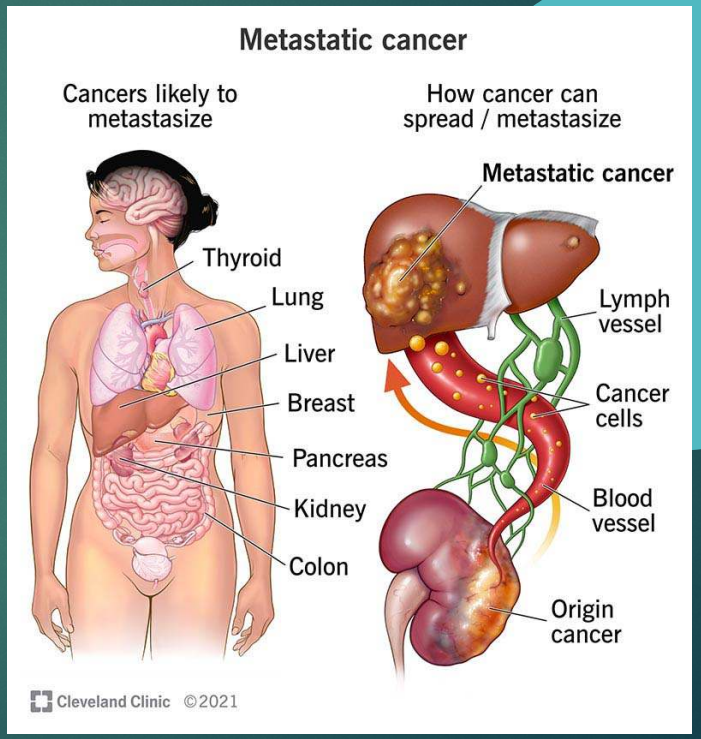
- Medical Students
- Registered Nurse
- Patient representative
- Pharmacist and Pharmacy Assistant
- Radiation Therapist
- Resident
- Sexuality Counsellor
- Speech Language Pathologist
- Volunteers

What is a stage?

- Stages describe how much cancer has grown and spread. All cancers are staged a little differently. Cancers are usually staged from Stage 0 to Stage 4.
- The importance of knowing the stage of your cancer is that it helps the care team understand your prognosis (how the cancer is going to affect you) and determine the treatment that will be recommended.
- **Stage 0** means different things in different cancers, and generally, it implies the presence of a small number of cancer cells that do not extend to new areas from where they started to grow.
- **Stage 1** The cancer is usually small and grows only in one place.
- **Stage 2** The cancer is bigger than stage 1 and/or has started growing into the surrounding tissue. In some cancers, this includes cancer has spread into nearby lymph nodes
- **Stage 3** The cancer has grown larger or invaded more deeply into surrounding healthy tissue, and may have spread to nearby lymph nodes
- **Stage 4** The cancer has spread to other parts of the body. Cancer usually can't be cured but we can control the growth of cancer with treatment.

Metastasis

- Cancer cells can be carried by the lymphatic system or by the blood stream to other organs.
- When they reach a new area, they may form a new tumor.
- This is called a metastasis.



Treatment/ Management of cancer

Genomics

- A way to look for genes, proteins or tumor markers than can provide more information about cancer.
- Each person's cancer has a unique pattern of biomarkers
- Solid tumors and blood cancer can get biomarker testing that can lead to targeted/precision treatment plans
- Help with selecting cancer treatment for you
  - For example,
    - EGFR (epidermal growth factor receptor) gene can get treatments that target those changes called EGFR inhibitors
      - Used in lung, colorectal, breast, pancreatic and head and neck cancers
    - BRAF in melanoma
    - ER, PR, and HER2 in breast and endometrial carcinoma
    - PD-L1, ALK, and many others in lung cancer
    - MSI-high in colon cancer

Surgery

Radiation

Anticancer Drug Therapy (Chemotherapy)

- Eliminates cancer cells
- Shrink tumor
- Prevent cancer from spreading
- Relieve symptoms from cancer
- Often have side-effects because treatment also slows the growth of healthy cells

Endocrine therapy

THEY CAN

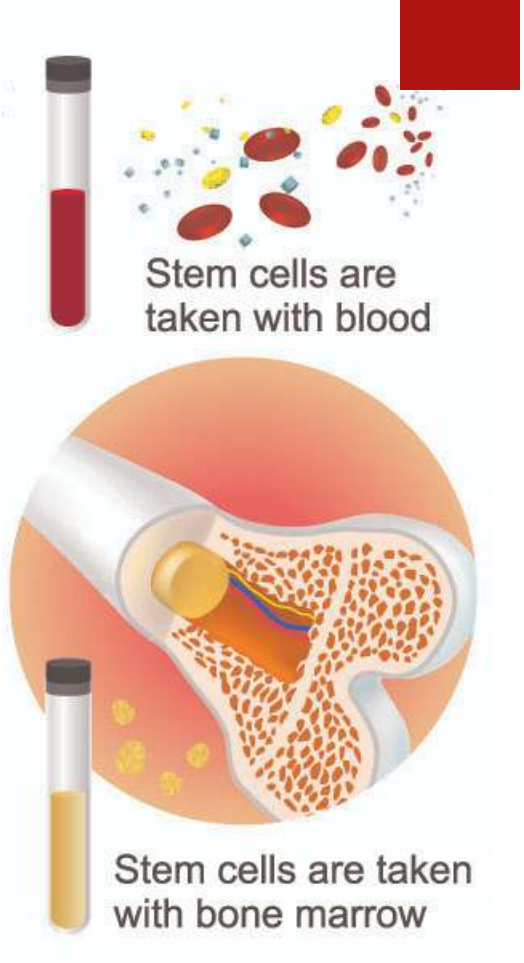
- Stop the body from making the hormone
- Block the hormone from attaching to cancer cells
- Alter the hormone so it doesn't work like it should

CAN BE USED TO

- Treat a certain kind of cancer by stopping or slowing its growth
- Lessen symptoms related to a certain type of cancer

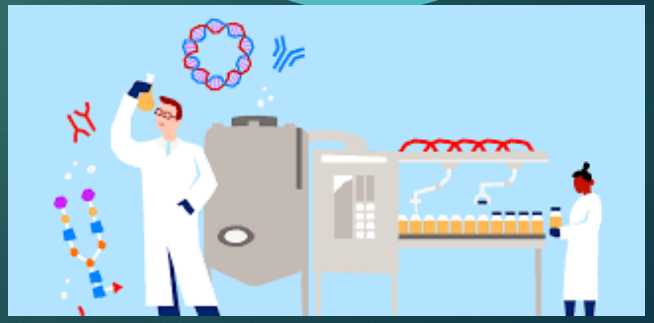
Manitoba Blood and Marrow Transplant program

- Blood & Marrow transplantation is a medical procedure used to treat diseases once thought to be incurable.
- Stem cells are taken from either the patient living with cancer (autologous), from a living donor (allogeneic) or an identical twin donor (syngeneic).
- Chemotherapy is given to the patient to destroy as many cancer cells as possible.
- The stem cells are then transplanted back into the patient, allowing healthy blood cells to grow, new blood cells to form and boosting the patient's defense against infection.



Biologics and biosimilar therapy

- Made from living cells
- Used to kill cancer cells or stop them from growing
- Some make your immune system strong
- Biosimilars are highly similar copies of existing biologic drugs
- Monoclonal antibodies uniquely bind to cancer cells and activate the immune system against them



BIOLOGICAL/Immunotherapy

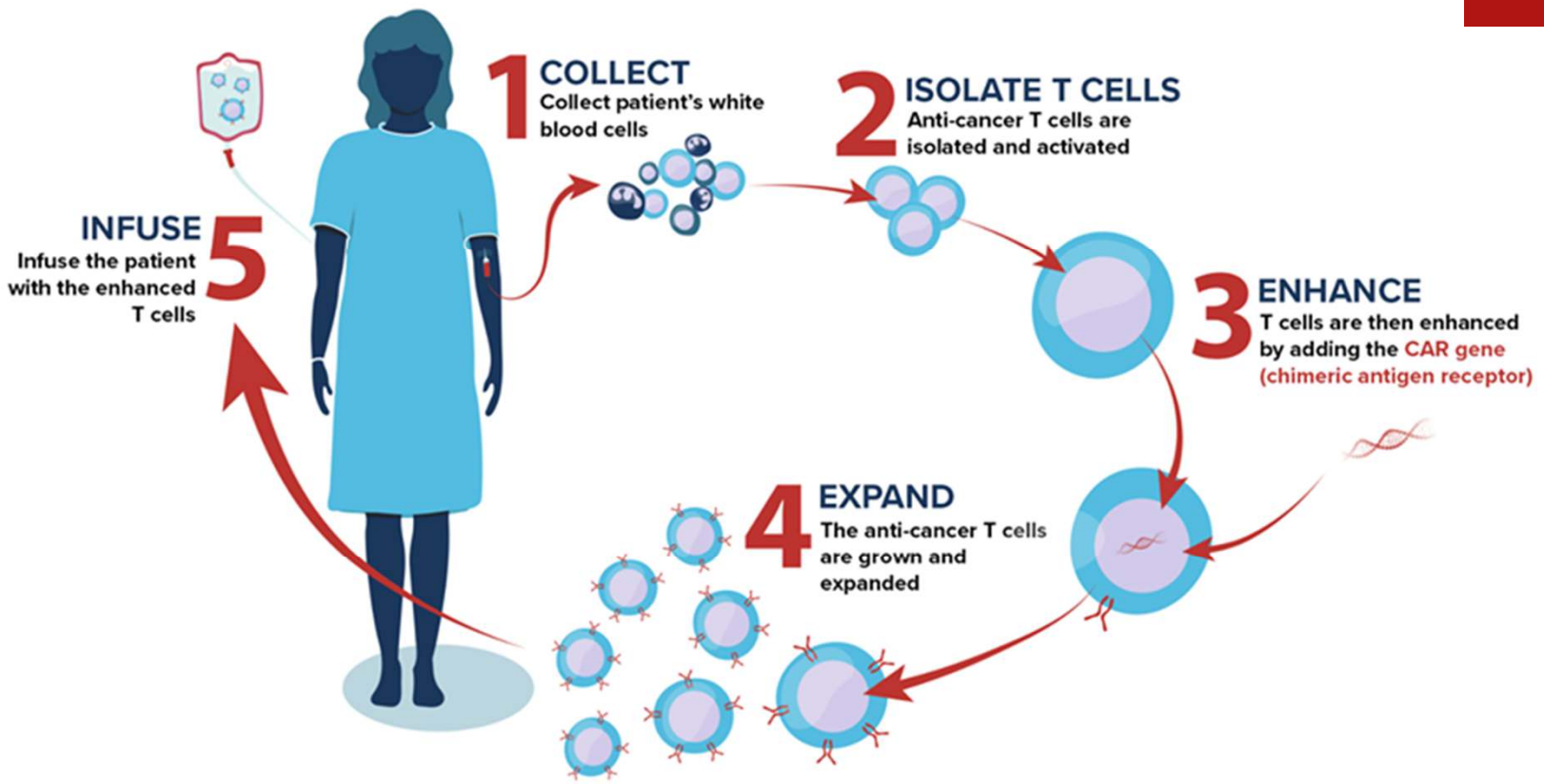
- Use the body's immune system to fight tumors
- Help immune system detect cancer cells and attack them
- Stop or slow the growth of cancer
- Stop cancer from spreading to other parts of the body
- Help the immune system work better to destroy cancer cells
- Deliver toxins, such a radiation or chemotherapy directly to cancer cells

Types of Biological Therapy/Immunotherapy

- Monoclonal antibodies (rituximab)
- Immune checkpoint inhibitors (PD-1, PD-L1, CTLA-4, pembrolizumab is an example)
  - Monoclonal antibodies that work by blocking checkpoint proteins so that the immune system can attack and kill the cancer cells
- Conjugated monoclonal antibodies (Trastuzumab)
  - Monoclonal antibodies are used to carry radioactive substances or chemotherapy drugs
- Non-specific immunotherapy (Interferon, Interleukin, G-CSF, BCG, Imiquimod)
- Immunomodulating drugs (ie. Lanolidomide)

CAR-T Therapy

- Reprogramming a person's own immune cells to find and attack cancer cells
- Effective for treating some types of leukemia and lymphoma
- T-cells are specific WBCs that are taken from the donor, modified in lab so that they attack cancer cells
- The changed cells are call chimeric antigen receptor T cells
- Grown in large numbers the infused back into the patient
- Typically, only one treatment required
- January 2023, CancerCare Manitoba Announced provincial funding for CAR-T therapy in Manitoba


1 COLLECT
Collect patient's white blood cells
2 ISOLATE T CELLS
Anti-cancer T cells are isolated and activated
3 ENHANCE
T cells are then enhanced by adding the CAR gene (chimeric antigen receptor)
4 EXPAND
The anti-cancer T cells are grown and expanded
5 INFUSE
Infuse the patient with the enhanced T cells

Older Adult Oncology

- Aged-Based Disparities in Cancer Care
  - Research lacks
  - Treatment under/over even with health status is considered
  - Outcomes
  - Unmet needs
- Ageism
  - Stereotypes, prejudice, discrimination

- Comprehensive Geriatric Assessments
  - Health and Functional status
  - Social supports & resources
  - Life and healthcare experiences
  - Life expectancy

"Hope is the most beautiful of all the affections, and doth much to the prolongation of life, if it be not too often frustrated, but entertaineth fancy with an expectation of good."

- Francis Bacon