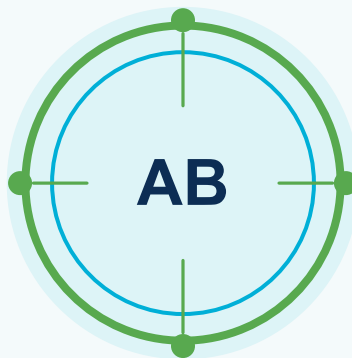


IMMUNE

# NURSING STUDY NOTES

Immune system nursing bundle

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# IMMUNE SYSTEM OVERVIEW

**THE IMMUNE SYSTEM** is made up of organs, blood cells, antibodies and chemicals that protect the body and its cells from foreign invaders that cause infection

## THYMUS

- Aids in development of T Cells
- Development of adaptive immunity

## TONSILS

Filter out germs from the mouth & throat to prevent them from entering the body

## SPLEEN

- Stores blood for future use
- Detects & filters old and damaged cells

## LYMPHATIC VESSELS

- Transport & filter lymphatic fluid before it re-enters circulation
- Produce & release lymphocytes
- Maintains fluid balance

## APPENDIX

- Stores "good" bacteria for GI tract
- Contains lymphoid cells that help prevent infection

## LYMPH NODES

- Filter substances traveling in the lymphatic fluid
- Contain lymphocytes that fight infection and disease

## BONE MARROW

- Produces red blood cells (carry oxygen to tissues)
- Produces platelets (control bleeding)
- Produces white blood cells (fight infection)

## ANTIGEN vs. ANTIBODY

**ANTIGEN:** Triggers immune response

- ▶ Allergens, bacteria, viruses, fungi, venom

**ANTIBODY:** Fights against the antigen

- ▶ A protein made of plasma cells (type of WBC) created in response to antigen

## TYPES OF LEUKOCYTES (WBC)

### NEUTROPHILS

- First cells that respond to foreign organisms
- Ingests & releases enzymes to kill invaders
- Boosts response of other immune cells

### BASOPHILS

- Defend against allergens, parasites & pathogens
- Release:
  - ▶ Leukotrienes (allergy response)
  - ▶ Cytokines (immune regulator)
  - ▶ Histamines (inflammatory response)

### EOSINOPHILS

- Defend against parasitic & bacterial infections
- Regulate inflammatory response

### LYMPHOCYTES

Produce antibodies & directly attack invaders

#### B-CELLS

- Create antibodies
- Attack invaders & abnormal cells

#### T-CELLS

- Directly attack infected foreign cells
- Stimulate b-cells to make antibodies

### MONOCYTES

Surround, ingest, kill & remove foreign substances

#### DENDRITIC CELLS

- Initiate & regulate immune response
- Think **DENDRITE** like in neuro (communicate to other cells)

#### MACROPHAGES

- Surround & kill foreign cells

PHAGE  
MEANS  
EAT

## NORMAL RANGES

**WBC:** 4,500–11,000/  $\mu$ L

**NEUTROPHILS:** 40–70%

**BASOPHILS:** 0.1–2%

**EOSINOPHILS:** 1–5%

**LYMPHOCYTES:** 20–40%

**MONOCYTES:** 4–13%

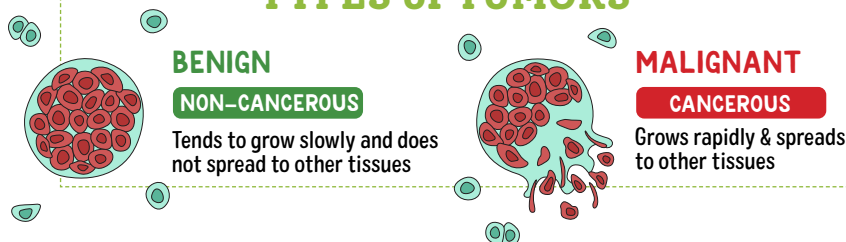
# CANCER OVERVIEW

## WHAT IS IT?

Disease caused by uncontrolled division of abnormal cells in the body that spread to other tissues

→ Invasion of cells into other tissues cause affected areas to not function properly

## TYPES of TUMORS



## RISK FACTORS

### MODIFIABLE

- ▶ Tobacco & alcohol use
- ▶ Obesity
- ▶ Sedentary lifestyle
- ▶ Poor diet
- ▶ Excessive UV exposure

### NON-MODIFIABLE

- ▶ Older age
- ▶ Family history
- ▶ Bacterial/ viral infections

## CARCINOGENESIS

The process of normal cells turning into cancer cells

### STAGE 1

#### INITIATION

Cell mutation occurs (irreversible)

### STAGE 2

#### PROMOTION

Transformed cells divide

### STAGE 3

#### PROGRESSION

Tumor grows (cancer cells compete with normal cells)

## TNM STAGING

Used to stage the current state & progression of tumor

### TUMOR

Size & extent into other tissues

**TX:** Tumor can't be measured

**T0:** Tumor can't be found

**TIS:** Tumor in situ (inside original place)

**T1 TO T4:** Size & extent of tumor

↑ NUMBER = ↑ SPREAD INTO OTHER TISSUES

### NODES

Spread into nearby lymph nodes

**NX:** Cancer can't be measured in lymph nodes

**N0:** No cancer in nearby lymph nodes

**N1 TO N3:** Location & # of lymph nodes affected

↑ NUMBER = ↑ # OF LYMPH NODES AFFECTED

### METASTASIS

Spread into other parts of the body

**MX:** Metastasis cannot be measured

**M0:** No metastasis

**M1:** Cancer has spread to other tissues

APPLIES TO **PRIMARY TUMOR ONLY**

## TUMOR GRADING

Grades how abnormal cancer cells are based on biopsy

### GRADE I

Well differentiated (resembles normal cells)

### GRADE II

Moderately differentiated

### GRADE III

Poorly differentiated

### GRADE IV

Undifferentiated (cells extremely abnormal)

## GENERAL CANCER SYMPTOMS

- C** hanges in bowel or bladder habits
- A** sore that doesn't heal
- U** nusual discharge or bleeding
- T** hickening/ lump/ mass or tumor
- I** ndigestion or difficulty swallowing
- O** bvious changes in moles or warts
- N** agging cough or persistent hoarseness

## DIAGNOSTICS

**TUMOR MARKER TESTS:** Tests for specific markers produced by or in response to tumor

**PET SCAN:** Use of an injected tracer (radioactive glucose) & then pictures taken to expose cancer cells

**CT SCAN:** Will show solid tumor masses

**BIOPSY:** Sample of the abnormal tissue is removed and tested for cancer cells

# TYPES OF CANCER

## LUNG CANCER

### SYMPTOMS

- Cough that doesn't go away
- Unintentional weight loss
- Coughing up blood
- Chest pain
- Shortness of breath

### DIAGNOSTICS

- Sputum cytology
- Imaging tests
- Lung biopsy

### TREATMENT

- Chemotherapy
- Radiation therapy
- Immunotherapy
- Lobectomy



## COLORECTAL CANCER

### SYMPTOMS

- Changes in bowel patterns
- Blood in the stool
- Persistent abdominal pain

### DIAGNOSTICS

- Colonoscopy
- Imaging tests
- CarcinoEmbryonic Antigen (CEA)

### TREATMENT

- Polypectomy (removal of polyps during colonoscopy)
- Laparoscopic surgery
- Endoscopic mucosal resection
- Colectomy
- Lymph node removal

## PROSTATE CANCER

### SYMPTOMS

- Urinary changes
- Dysuria
- Frequency
- Weak stream
- Blood in urine or semen

### DIAGNOSTICS

#### GOLD STANDARD

- Prostate-Specific Antigen (PSA) Test
- Biopsy using Transrectal US or MRI

### TREATMENT

- Radical prostatectomy
- Chemotherapy
- External beam radiation therapy (with or without brachytherapy)
- Hormone therapy

## SKIN CANCER

### SYMPTOMS

#### REMEMBER ABCDE

- A**symmetry (opposing sides do not match)
- B**order (edges are irregular, ragged, blurred)
- C**olor (more than one color present)
- D**iameter (larger than 6mm)
- E**volving (changing in size, shape, color, etc.)

### DIAGNOSTICS

- Skin biopsy
- Imaging tests

### TREATMENT

- Cryotherapy
- Mohs micrographic surgery
- Chemo & radiation
- Immunotherapy

## TESTICULAR CANCER

### SYMPTOMS

- Lump or swelling in testicles
- Feeling of heaviness in the scrotum
- Pain in testicle or scrotum
- Groin or lower abdominal pain

### DIAGNOSTICS

- Tumor marker tests
- Imaging tests

### TREATMENT

- Chemotherapy
- Radiation therapy
- Immunotherapy
- Surgery

## BREAST CANCER

### SYMPTOMS

- Lump in breast or armpit
- Swelling or thickening of breast
- Dimpling of skin
- Nipple retraction
- Discharge (not breast milk)

### DIAGNOSTICS

- Mammogram
- Biopsy
- CT/ PET Scan

### TREATMENT

- Chemotherapy & radiation
- Hormone therapy
- Mastectomy
- Lumpectomy