Patient's Assessment

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Acknowledgment

This two-year curriculum was developed through a participatory and collaborative approach between the Academic faculty staff affiliated to Egyptian Universities as Alexandria University, Ain Shams University, Cairo University, Mansoura University, Al-Azhar University, Tanta University, Beni Souef University, Port Said University, Suez Canal University and MTI University and the Ministry of Health and Population (General Directorate of Technical Health Education (THE)). The design of this course draws on rich discussions through workshops. The outcome of the workshop was course specification with Indented learning outcomes and the course contents, which served as a guide to the initial design.

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Special thanks to the Minister of Health and Population Dr. Hala Zayed and Former Minister of Health Dr. Ahmed Emad Edin Rady for their decision to recognize and professionalize health education by issuing a decree to develop and strengthen the technical health education curriculum for pre-service training within the technical health institutes.
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# patient's assessment

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<th>Number of Academic Hours</th>
<th>Practical Number of Hours</th>
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<tr>
<td>1</td>
<td>24</td>
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## Description of the Course

### Course Code:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>patient's assessment</td>
<td>Upon completion of this course, the student should be equipped with the necessary knowledge and skills to use interview patient to obtain a comprehensive health history and perform physical assessment through inspection, palpation, percussion and auscultation.</td>
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### Objectives:

1. Identify the categories of information contained in a health history.
2. Describe the parts of the hands to palpation techniques used in assessment.
3. Describe direct and indirect percussion.
4. Identify the equipment needed for the screening physical examination.
5. Define pupillary light reflex, fixation, and accommodation.
6. Define the different medical terms related to abnormalities of different body systems.
7. Explain the difference between primary and secondary survey.
8. Recognize the important of pre and postoperative assessment tips.

### Mental Skills:

1. Interpret findings obtained during inspection.
2. Interpret findings obtained during auscultation.
3. Interpret findings obtained during percussion.
4. Interpret findings obtained during palpation.
5. Distinguish between findings of ‘normality’ and ‘deviations from normality’ in the assessment process.
6. Differentiate between light and deep palpation.

### Professional Skills:

1. Perform a comprehensive health history, using interviewing techniques.
2. Demonstrate a bedside nursing interview, general survey, and head to toe assessment and document findings.
3. Use recommended techniques to perform physical examination.
4. Use the correct sequence of examining techniques.
5. Demonstrate respect for privacy, dignity and confidentiality when undertaking health assessment.

### Course Contents:

1. Identify the categories of information contained in a health history.
2. Describe the parts of the hands to palpation techniques used in assessment.
3. Describe direct and indirect percussion.
4. Identify the equipment needed for the screening physical examination.
5. Define pupillary light reflex, fixation, and accommodation.
6. Define the different medical terms related to abnormalities of different body systems.
7. Explain the difference between primary and secondary survey.
8. Recognize the important of pre and postoperative assessment tips.
1. Use the communication skills appropriately to gather data.
2. Collaborate with colleagues to perform health assessment.
3. Demonstrate self confidence while interviewing the patient to obtain health history.
4. Demonstrate responsibility for independent learning.
5. Use lab time appropriately to practice the skills that have been demonstrated on a partner.

### محتوى المقرر:
- Overview about health assessment and history taking
- Physical examination
- Integumentary system assessment
- Head and neck assessment
- Nervous system assessment
- Respiratory system assessment
- Cardiovascular system assessment
- Gastrointestinal system assessment
- Urinary system assessment
- Musculoskeletal system assessment
- Breast and lymphatic system assessment
- Emergency assessment
- Pre and postoperative assessment

### أساليب التعليم والتعلم
- Modified lectures.
- Demonstrations.
- Supervised skills practice on peers.
- Student's assignment
- Self directed learning (including books, audio-visual resources).

### تقويم الطلاب:

A - الأسئلة المستخدمة

- Practice exam: 40 degrees
- Semester work: 20 degrees
- Final written exam: 90 degrees
- Total: 150 degrees

### قائمة الكتب الدراسية والمراجع:

A - مذكرات

B - كتب ملمزمة

Patient's assessment
Course Description

Upon completion of this course, the student should be equipped with the necessary knowledge and skills to use interview patient to obtain a comprehensive health history and perform physical assessment through inspection palpation, percussion and auscultation.

Core Knowledge

By the end of this course, students should be able to:

- Identify the categories of information contained in a health history.
- Describe how to perform physical examination techniques.
- Identify the equipment needed for the screening physical examination.
- Define the different medical terms related to abnormalities of different body systems.
- Explain the difference between primary and secondary survey.
- Recognize the important of pre and postoperative assessment tips.
- Interpret findings obtained during inspection, auscultation, percussion and palpation of the body systems.
- Distinguish between findings of ‘normality’ and ‘deviations from normality’ in the assessment process

Core Skills

By the end of this course, students should be able to:

- Perform a comprehensive health history, using interviewing techniques
- Demonstrate a bedside nursing interview, general survey, and head to toe assessment and document findings.
- Use recommended techniques to perform physical examination.
- Use the correct sequence of examining techniques.
- Demonstrate respect for privacy, dignity and confidentiality when undertaking health assessment.
### Course Overview

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<tr>
<th>ID</th>
<th>Topics</th>
<th>Interactive Lecture</th>
<th>Field Work</th>
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<td>Cardiovascular system assessment</td>
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<td>Trauma patient assessment</td>
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<td>12</td>
<td>Pre and postoperative assessment</td>
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Chapter 1

Health Assessment

Objectives

- Define health assessment.
- List types of assessment.
- Mention sources of data.
- Discuss phases of health assessment.
- Mention methods of data collection.
- State types of interview.
- State the purpose of the complete health history.
- List the categories of information contained in a health history.
- Describe the data or information that must be gathered for each category of a health.

Overview of Health Assessment

**Introduction**

Assessment is the first stage of the nursing process in which the assessor should carry out a complete and holistic assessment of every patient's needs. Assessments are made initially and continuously throughout patient care.

**Assessment** is "a dynamic and continuous process of collecting, verifying, and organizing information about a person within a particular context."

Or

"The ongoing and continuous collection of data about an individual's health state throughout all the phases of the nursing process".
**Purposes of Assessment**

It enables the assessor to:

- Determine the global health needs of the person including:
  
a. Health promotion needs: such as enhance well being, preventative interventions.

b. Health risk factors

   - **Non-modifiable risk factors** e.g. congenital and hereditary factors.
   - **Modifiable risk factors** e.g. diet, smoking, and sedentary lifestyle.

c. Potential/risk health problems e.g. person with traumatic wound is at risk for infection.

d. Actual health problems.

- Provide basis for effective care based on identified needs.
- Evaluate the progression of patient's condition and the treatment received and care provided.
- Contribute to effective medical decisions via the communication of information.
- To collect data for research

**Domains to be assessed:**
The domains contribute to the development of a holistic picture. The domains include:

a. **Physiological**: Physical and functional characteristics.

b. **Psychological**: Emotional and cognitive features.

c. **Social**: Interpersonal relationships with individuals and groups.

d. **Cultural**: Primary language, shared beliefs, perceptions and practices based on common heritage or racial background.

e. **Spiritual**: Beliefs and values that provide strength, hope and meaning to life; religious tenets and practices.

f. **Developmental**: Growth over time.
**Patient’s Assessment**

<table>
<thead>
<tr>
<th>Types of assessment</th>
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<td>1. Initial comprehensive assessment.</td>
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<td>2. Ongoing or partial/shift assessment.</td>
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<td>3. Focused or problem-oriented assessment.</td>
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<td>5. Time-lapsed assessment.</td>
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1) **Initial/ Comprehensive assessment**

Initial assessment is performed to evaluate the client’s health status on admission and to have a baseline comprehensive data about the client. E.g.: Nursing admission assessment.

It involves collection of **subjective data** about the past health history, family history, and lifestyle and health practices. As well as **objective data** gathered during a step-by-step physical examination.

2) **Ongoing or partial/shift assessment:**

Partial assessment is performed at the commencement of every shift on every patient and the collected data is used to develop a plan of care. The shift assessment includes:

- **Airway:** noises, secretions, cough, artificial airway
- **Breathing:** bilateral air entry and movement, breathe sounds, respiratory rate, rhythm, spontaneous/ supported/ ventilator dependent, oxygen requirement and delivery mode.
- **Circulation:** pulses (rate, rhythm and strength); peripheral temperature, color and capillary refill time; skin, lip, oral mucosa and nail bed color.
- **Disability:** mobility aids or transfer requirements, and prosthetics required.
- **Focused:** assessment of presenting problem(s) or other identified issues, e.g. cardiovascular, respiratory, gastrointestinal, renal, etc.
- **Pain:** Faces, numeric scale, pain assessment tool.
- **Hydration/Nutrition:** Fasting, diet, oral, nasogastric, gastro-stomy, jejunostomy, IV fluids.
- **Output:** Urine, bowels, drains, losses, fluid balance.
- **Risk:** Pressure injury risk assessment, falls risk assessment, presence of identification (ID) bands.
- **Wellbeing**: Mood, sleeping habits and coping strategies.
- **Social**: Family, discharge plan.

3) **Focused or problem oriented assessment**:  
   It is a detailed assessment of specific body system(s) relating to the presenting problem of the patient.  
   In focused assessment, the assessor determines whether the problems still exist and whether the status of the problem has changed (i.e. improved, worsened, or resolved).  
   This may involve one or more body systems. e.g., cardiovascular, respiratory, neurological.

4) **Emergency Assessment**:  
   It is a very rapid assessment performed in a life threatening situations in which the preservation of life is the top priority.  
   Emergency assessment focuses on airway, breathing and circulatory problems (the ABCs).

5) **Time-lapsed Reassessment**  
   Time lapsed reassessment, takes place after the initial assessment to evaluate any changes in the clients' health status.  
   Assessors perform time-lapsed reassessment when substantial periods of time have elapsed between assessments (e.g., periodic outpatient clinic visits, home health visits, health and development screenings) to compare the client's current status to baseline data previously obtained.

<table>
<thead>
<tr>
<th>Phases Of Assessment Process</th>
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<tr>
<td>1. Collecting data</td>
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<td>2. Validating (verifying) data</td>
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<td>3. Organizing data</td>
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<td>4. Analyze the data</td>
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<tr>
<td>5. Documenting data</td>
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1. **Collecting Data:**

*Data collection* is "the process of gathering information about a client’s health status". It must be both systematic and continuous to prevent the omission of significant data and reflect a client’s changing health status.

**Types of Collected Data:**

- **Subjective Data (Stated)**
  - It referred to as *symptoms* or covert data.
  - It is the verbal statements stated to the assessor by the patient through *interview*.
  - It can be described or verified only by that person.
  - It includes complete health history:
    - Biographical data
    - Reasons for seeking health care
    - History of present health concerns
    - Past health history
    - Family health history
    - Lifestyle and health practices profile
    - Developmental level
  - It includes the client’s sensations, feelings, values, beliefs, and attitudes. Itching, pain, and feelings of worry are examples of subjective data.
  - e.g. “I feel dizzy.” “My bladder never seems empty.”

- **Objective Data (Observed)**
  - It referred to as *signs* or overt data.
  - It is evident, measurable, and verifiable observations such as vital signs, odors, redness of a wound, hostile behavior, and laboratory and medical imaging findings.
  - It can be seen, heard, felt, or smelled, and they are obtained by observation or *physical examination*.
  - Objective data include:
    - Physical characteristics
    - Body functions
    - Appearance
- Behavior
- Measurement
- Results of laboratory testing
e.g. "Blood pressure: 90/60, Pulse 110" "patient voids 100-150mls/void q 1-2 h.

The objective data support the subjective data: what you observe confirms what the person is stating.

Sources of data:
1. **Primary source**: Data are directly gathered from the client using interview and physical examination.

   The alert and oriented patient can provide information about past illness and surgeries and present signs, symptoms, and lifestyle. When the patient is unable to supply information because of deterioration of mental status, age, or seriousness of illness, secondary sources are used.

2. **Secondary source**: Data are gathered from client’s family members, significant others, client’s medical records/chart, other members of health team, and related care literature/journals.

Methods of data collection

A. **Observation**

   Observation is "a conscious, deliberate skill that is developed using the five senses to gather patient and environmental data".

   It provides the assessor with ways to check for nonverbal expression of feelings.

B. **Interview**

   An interview is" A planned communication or a conversation with purpose".

   Purposes of interview are to get or give information, identify problems, evaluate change, teach, provide support, or provide counseling or therapy.

General Guidelines for Interviewing to Obtain Health History

A. **Greeting client, introduce self and establishing rapport.** Use appropriate title (Use “Mr.”, “Mrs.”, or similar titles unless the patient is a child or adolescent).

B. **Quickly review the patient's chart** (to provide you with an idea of the patient and will avoid asking repetitive questions).

C. **Setting goals for the interview.**
D. *Improving the environment.* It should be private, quiet and uninterrupted.

E. *Taking Notes.*

F. *Inviting the Patient’s Story.* Begin with open-ended questions that allow full freedom of response, e.g. “What brings you to the hospital?” Inquire how client is feeling; watch for signs of discomfort such as evidence of pain or anxiety.

G. *Listen actively* for important symptoms, emotions, events and relationships. Be empathetic and caring

H. *Be professional- nonjudgmental, concerned and informed.* Reactions as disapproval, impatience (nonverbal behaviors) block communication.

I. *Assure confidentiality.* Assure clients that the information you collect will be shared only with the health care team.

**Types of interview:**
- **Directive interview**- Assessor directs and controls interview, and ask mostly closed ended questions. Client responds to questions and has limited chances to discuss concerns.
- **Nondirective interview**– The role of the assessor is to clarify, summarize, and ask mostly open-ended questions that facilitate thought, communication and rapport-building where the client is in control of the purpose, subject, and pace.

**Types of questions:**
- **Open-ended questions**– Open-ended questions encourage the patient to elaborate, build rapport, or help the patient to express, clarify, or illustrate feeling or thoughts. e.g.
  “How have you been feeling lately?”
- **Closed-ended** – used in directive interviewing, and are questions that require a yes or no answer.
- **Leading question** – directs the client’s answer e.g.
  “You are stressed about surgery tomorrow, aren’t you?”

**C. Physical examination**

The physical examination or physical assessment is "A systematic data-collection method to obtain the objective data needed to complete the assessment and detect health problem".

To conduct the examination the assessors uses techniques of inspection,
auscultation, palpation, and percussion. It will be discussed later.

2. **Validating Data:**

*Validation* is "the act of “double-checking” or verifying data to confirm that it is accurate and factual".

**When you should validate data?**
- Subjective and objective data do not agree together.
- The patient’s statements differ at different times in the interview.
- The data fall far outside normal range.
- Factors are present that interfere with accurate measurement.

**Validate questionable information by using the following techniques, as appropriate:**
- Double-check that your equipment is working correctly.
- Recheck your own data (e.g. take a client’s blood pressure in the opposite arm or 10 min later).
- Look for factors that may alter accuracy.
- Ask someone else, preferably an expert, to collect the same data.
- Compare subjective and objective data to see if what the person is stating is congruent with what you observe.
- Clarify statements and verify your inferences (e.g. “To me, you look tired”).

3. **Organizing Data:**

The assessor should record data throughout the assessment followed by formal documentation in an organized framework using a written or computerized format that organizes the assessment data. Most health care agencies have developed their own structured assessment format.

4. **Analyzing Data:**

Compare data against standard and identify significant cues.

Standard e.g. normal vital signs, standard weight and height, normal laboratory/diagnostic values, normal growth and development pattern.
5. **Documenting Data (Reporting & Recording):**

To complete the assessment phase, the assessor records client data. Accurate documentation is essential and should include all data collected about the client’s health status. Documentation is an important step of assessment because it forms the database for the entire nursing process and provides data for all the members of the health care team.

Data are recorded as facts and not as interpreted by the assessor. e.g. the assessor records the client’s breakfast intake (objective) as “coffee 240 mL, 1 egg, and 1 slice of toast”.

**Basic components of health assessment**

- (A)Complete health history
- (B)Physical examination

### Health History

**Health history** is "a review of the client’s functional health patterns prior to the current contact with a health care agency."

**Components of health history:**

- Demographic information
- Reason for seeking health care
- History of the present illness
- Past health history
- Family medical history
- Review of systems
- Lifestyle practices/Nutrition
- Current medication
- Psychological history
- Sociocultural history
- **Demographic information**
  - Name
  - Gender
  - Address
  - Type of health insurance
  - Date of birth
  - Race
  - Occupation

- **Reason for seeking health care**
  - Patients should be asked about their reason for seeking medical help. It is important to get the chief complaint in the patient’s own words.

- **History of the present illness**
  - A clear, chronological account of the events that led the client to seek care.
  - Relevant data regarding symptoms should include (COLDSPA):
    - **Character** (the quality of feeling or sensation, e.g. sharp, dull, and stabbing).
    - **Onset/Timing** (onset, duration, frequency, and precipitating factors of the symptoms).
    - **Location** (area of the body in which symptom is felt).
    - **Duration**
    - **Severity/Intensity** (the severity or quantity of the feeling).
    - **Pattern** (Aggravating/Alleviating factors/activities or actions that make the symptom better or worse).
    - **Associated factors/How it affects** the client (What other symptoms occur with it? How does it affect you?)

- **Past health history**
  - Major illnesses or previous hospitalizations and surgical procedures.
  - Allergies (food, drug, and airborne allergies).
  - Previous injuries/Fractures.
  - Childhood diseases/Immunizations (history of polio, measles, mumps, and rubella).

- **Family medical history**
  - Diabetes mellitus.
  - Allergic disorders.
  - Cardiovascular problems and race.
**Patient’s Assessment**

**Review of systems**

- A brief account from the client of any recent signs or symptoms associated with any of the body systems.
- It reveals data related to present illness.
- The review of systems checklists are often used to ask about:
  - **General**: Usual weight, recent weight change, weakness, fatigue, or fever.
  - **Skin**: Rashes, lumps, sores, itching, dryness, color change, changes in hair or nails.
  - **Head**: Headache, head injury, dizziness.
  - **Eyes**: Vision, glasses or contact lenses, redness, excessive tearing, double vision, blurred vision, flashing lights, glaucoma, cataracts.
  - **Ears**: Hearing, tinnitus, vertigo, earaches, infection, discharge. If hearing is decreased, use of hearing aids.
  - **Nose and sinuses**: Frequent colds, nasal stuffiness, discharge, or itching, nosebleeds and sinus trouble.
  - **Throat (or mouth and pharynx)**: Condition of teeth, gums, bleeding gums, dentures, sore tongue, dry mouth, frequent sore throats, and hoarseness.
  - **Neck**: Lumps, “swollen glands,” goiter, pain, or stiffness in the neck.
  - **Breasts**: Lumps, pain or discomfort, nipple discharge
  - **Respiratory system**: Cough, sputum (color, quantity), hemoptysis, dyspnea, wheezing, pleurisy, last chest x-ray.
  - **Cardiovascular**: Heart trouble, high blood pressure, rheumatic fever, chest pain or discomfort, palpitations, dyspnea, orthopnea, and or edema.
  - **Gastrointestinal system**: Heart burn, appetite, trouble swallowing, nausea, change in bowel habits, rectal bleeding hemorrhoids, abdominal pain, constipation, diarrhea, passing of gas, food intolerance and/or excessive belching.
  - **Urinary system**: Frequency of urination, polyuria, nocturia, urgency, burning or pain on urination, hematuria, incontinence; reduced force of the urinary stream, hesitancy and/or dribbling of urine in males.
  - **Genital. Male**: Hernias, discharge from or sores on the penis, testicular pain or masses. **Female**: Age at menarche; regularity, frequency, and duration of periods; amount of bleeding, last menstrual period; dysmenorrhea, number of
deliveries, age at menopause, menopausal symptoms, postmenopausal bleeding.

- **Peripheral Vascular:** leg cramps, varicose veins, past clots in the veins.
- **Musculoskeletal system:** Muscle or joint pains, stiffness, arthritis, gout, and backache. Presence of any swelling, redness, pain, stiffness, weakness, or limitation of motion or activity; include timing of symptoms (e.g. morning or evening)
- **Neurologic system:** Fainting, blackouts, seizures, weakness, paralysis, numbness or loss of sensation, tingling, tremors or other involuntary movements.
- **Hematologic:** Anemia, easy bruising or bleeding, past transfusions and/or transfusion reactions.
- **Endocrine:** Thyroid trouble, heat or cold intolerance, excessive sweating, excessive thirst or hunger, polyuria.
- **Psychiatric:** Nervousness, tension, mood, including depression, memory change.

- **Lifestyle practices/Nutrition**
  - Hygienic practices
  - Skin exposure
  - Habits (the use of alcohol, drugs caffeine and tobacco use).
  - Activities of daily living (ADL’s) [bathing, toileting, transfer, eating, dressing].
  - Eating pattern.

- **Current medication**
  - Steroids, antibiotics, antihypertensive drugs, hypoglycemic drugs, vitamins, hormones or chemotherapy.

- **Psychological history**
  - The assessment of dimensions as self-concept and self-esteem.
  - Sources of patient’s stress and ability to cope.
  - Sources of support for clients in crisis, such as family, significant others, religion, or support groups.
  - Community involvement: Church involvement, volunteer work, employment, hobbies, group memberships, social and/or recreational programs, classes.
Sociocultural history
- Economic status: Amount and/or source of income, type of health insurance coverage, perception of adequacy of income to meet needs
- Home environment.
- Client’s role in the family.
- The cultural aspects of the client’s lifestyle, health beliefs, and health practices.
Objectives

- Define physical assessment.
- Discuss general guidelines for physical examination.
- Identify equipments used in physical examination.
- Mention positions for examination of different body parts.
- Discuss techniques of physical examination.
- Differentiate between different percussion sounds.
- Mention types of palpation.
- State guidelines for palpation.
- Mention types of percussion.
- Describe the content of general survey.

Physical examination

*It is the techniques used to gather objective data about the body from head to toes*.

**Preparation for physical assessment:**

- Provide a warm, comfortable, private environment with natural lighting, if possible.
- The room should be quiet. Eliminate distractions and disruptions (because excessive environmental noises may make detection of some physiological sounds difficult).
- Introduce yourself to the client by name and title if you have not already met the client.
- Explain the purpose of each step of the examination to the patient (*to alleviate anxiety and secure the patient’s cooperation*).

- Ask the client to undress and wear a patient's gown if a complete physical assessment is to be performed (*to facilitate the examination*).

- The person is also asked to void before examination.

- Wash your hands and wear gloves if the patient has drainage wound, bleeding and/or vomiting (*to prevent spread of infection*).

- Warm your hands and instruments before touching the client’s skin.

- Arrange the needed equipment and supplies, and check equipment for proper functioning.

**General guidelines for physical examination:**

- Approach the client calmly and confidently.

- Provide privacy by drawing the curtain or closing door.

- Wash hands and wear gloves when you may come in contact with body fluids or open lesions or if you have open areas in your skin.

- If you are right-handed, stand on the client’s right side.

- Drape the client well, exposing only those areas that are being examined.

- Be aware of your nonverbal communication during the examination; avoid frightening or embarrassing the client.

- Warn the client when any part of the examination may be uncomfortable.

- Be as gentle as possible.

- Be systematic and organized when assessing the client. (Inspection, then palpation, percussion and auscultation).

- If a client is seriously ill, assess the systems of the body that are more at risk.

- Perform painful procedures at the end of the examination.
## Equipments of Physical Examination

<table>
<thead>
<tr>
<th>Guidelines</th>
<th>Example</th>
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<tr>
<td>Flashlight or penlight</td>
<td>To assist viewing of the pharynx and cervix or to determine the reactions of the pupils of the eye</td>
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<tr>
<td>Laryngeal or dental mirror</td>
<td>To observe the pharynx and oral cavity</td>
</tr>
<tr>
<td>Nasal speculum</td>
<td>To permit visualization of the lower and middle turbinates; usually, a penlight is used for illumination</td>
</tr>
<tr>
<td>Ophthalmoscope</td>
<td>A lighted instrument to visualize the interior of the eye</td>
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<tr>
<td>Otoscope</td>
<td>A lighted instrument to visualize the eardrum and external auditory canal (a nasal speculum may be attached to the otoscope to inspect the nasal cavities)</td>
</tr>
<tr>
<td>Percussion (reflex) hammer</td>
<td>An instrument with a rubber head to test reflexes</td>
</tr>
<tr>
<td>Tuning fork</td>
<td>A two-pronged metal instrument used to test hearing acuity and vibratory sense</td>
</tr>
<tr>
<td>Vaginal speculum (various sizes)</td>
<td>To assess the cervix and the vagina</td>
</tr>
<tr>
<td>Cotton applicators</td>
<td>To obtain specimens</td>
</tr>
<tr>
<td>Disposable pads</td>
<td>To absorb liquid</td>
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<tr>
<td>Gloves (sterile and unsterile)</td>
<td>To protect the nurse</td>
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<tr>
<td>Lubricant</td>
<td>To ease insertion of instruments (e.g., vaginal speculum)</td>
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<tr>
<td>Tongue blades (depressors)</td>
<td>To depress the tongue during assessment of the mouth and pharynx</td>
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Positions of Physical Examination

1) **Standing/ Erect position:**
   - Upright posture with both feet flat on the floor.
   - Used to examine the musculoskeletal and neurological systems and to assess gait and cerebellar function.

2) **Sitting position:**
   - Sitting upright at side of bed or exam table.
   - Used to assess vital signs, head and neck, chest, cardiovascular system, and breasts.

3) **Supine position/ Recumbent:**
   - Lying flat on the back with arms and legs fully extended.
   - Used to assess the abdomen, breasts, extremities, and pulses.
   - If your client becomes short of breath, raise the head of the bed (HOB).

4) **Fowler’s position**, the head is elevated 60°.

5) **Semi-Fowler’s position**, the head is elevated only 30°–45°.

6) **Dorsal Recumbent position**
   Supine with knees flexed.
   - Used for abdominal assessment if the client has abdominal or pelvic pain.
   - Flexing the knees promotes relaxation of the abdominal muscles.

7) **Lithotomy position**
   - Dorsal recumbent position at end of table with feet in stirrups, legs flexed, and widely open.
- Used for a female pelvic exam.

8) **Sims’ position:**
   - Flexion of the hip and knees in a side lying position.
   - Used to examine the rectal area.

9) **Lateral position:**
   - Lying on the side in a straight line.
   - Left lateral is used to evaluate heart murmur or during cardio-vascular assessment.
   - This position brings the heart closer to the chest wall.

10) **Prone position:**
    - Lying on the abdomen.
    - Used to examine the musculoskeletal system, also be used to examine the back and buttocks.

11) **Knee–Chest position:**
    - On hands and knees with head down and buttocks elevated.
    - Provides good visualization for examining the rectal area.

### Techniques of physical assessment

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**INSPECTION**

*Inspection* is “a systematic visual examination of the patient done in a deliberate manner”.

or "The use of sight to gather data".

- Inspection should begin with general observation of the patient progressing to specific body areas.
- Through inspection we can observe patient's gait, posture, personal hygiene, grooming and mental status.
- Visual inspection of a patient’s respiratory status, for example, might reveal a rate of 38 breaths per minute and cyanotic nail beds.
- Describe what you see not what you think (e.g. swollen joints, not arthritis).
- The otoscope, ophthalmoscope, and penlight enhance inspection abilities.

**PALPATION**

*Palpation* is "the examination using the sense of touch by hand for determining the following characteristics: texture (rough/smooth), temperature (hot/warm/cold), moisture (dry/moist/wet), mobility (fixed/movable/still/vibrating), consistency (soft/hard/liquid filled), strength of pulses (strong/weak/thready/bounding), size (small/medium/large), shape (well defined/irregular), degree of tenderness, symmetry of body parts and presence of thrills”

(Thrills are fine vibrations and can sometimes be felt over aneurysms or stronger heart murmurs).

**Sensitivity of Parts of the Hands:**

- **Fingertips**: for pulsation.
- **Palm of hand**: for vibratory sensation.
- **Back or dorsum of the hand**: for temperature.
- **Grasping (all hand)**: for position and consistency.
- **The finger pads**: are useful in assessing fine tactile discrimination, skin moisture, and texture; the presence of masses, pulsations, edema, crepitation; and the shape, size, position, mobility, and consistency of organs.
Types of palpation

a. Light Palpation

Light palpation reveals information on skin texture and moisture, superficial masses; and fluid, muscle tone and superficial tenderness.

*Technique:*

- Place the hand with fingers together parallel to the area being palpated.
- Press down 1 to 2 cm.
- Repeat in ever-widening circles until the area to be examined is covered.

b. Deep Palpation

Deep palpation can reveal information about the position of abdominal organs and masses, as well as their size, shape, mobility, consistency, and areas of discomfort.

*Technique:*

- *One–handed deep palpation:* With fingers together, approach the area to be examined and use the pads and tips of the fingers of one hand to press in 4 cm.

*Two–handed deep palpation:*

Place the fingers of hand on top of those of the other. Example, deep palpation of the right upper quadrant area of the abdomen lets you estimate the size of the liver.
Guidelines for Palpation:

- Instruct patient to relax during palpation. Advise the client to take slow deep breath to enhance muscle relaxation.
- Palpation requires touching with different parts of the hand and with varying degrees of pressure to determine characteristics of pain, temperature, size, shape, moisture, and/or texture.
- Explain reason for touch to client.
- Warm hands.
- Use light palpation before deep palpation.
- Use palms of hand to assess vibrations.
- Use pads of fingers (most sensitive part) to identify texture, size, shape, or movement (e.g., pulse).
- Use dorsum of fingers for temperature assessment.
- Gently pinch skin to assess turgor.
- Use deep palpation gently and briefly to assess areas such as pelvis and abdomen for body organs and masses.
- Palpate painful areas last.

Percussion

Percussion is "striking or tapping of the body surface in order to elicit characteristic sound".

It is used to:

- Determine the location, size, and density of underlying structures.
- Detect the presence of air or fluid in a body space; and elicit tenderness.

Types of Percussion:

a. Direct Percussion

Percussion in which one or two fingers of one hand are used to strike the skin directly to elicit tenderness or pain. It is primarily used to assess sinuses in the adult.

Techniques:

- Using sharp rapid movements from the wrist, strike the body surface with the pads of two, three, or four fingers or with the pad of the middle finger alone.
a. Indirect Percussion

Using the middle finger of the dominant hand as the striking finger, and tap the middle finger of the other hand using a quick motion from the wrist.

Percussion sounds that will be heard include:

- **Tympany** – Loud, musical, drum like sound heard over low density such as stomach or intestine filled with air (abdominal distension with gas).
- **Hyperresonance** – Loud, echoing, hollow sound, lower pitched than resonance, heard over areas with mixed density such as over-aerated lung tissue found in COPD. Hyperresonance sound lies between tympany and resonance.
- **Resonance** – Loud, hollow, low-pitched sound heard over areas with mixed density such as structures containing air e.g. the normal lungs and abdomen.
- **Dullness** – Quiet, thudding sound, heard over solid organs with high density such as the heart, liver, spleen or a distended bladder.
- **Flatness** – Short, quiet, flat sound heard over very dense tissue e.g. bone and muscle.

**AUSCULTATION**

**Auscultation** is “the use of hearing sense to listen to sounds produced inside the body to determine presence and quality of heart, lung, and bowel sounds”. or "It is the use of hearing to gather data".

**Types of auscultation:**

- **Direct auscultation** is listening without using an instrument (e.g. hearing wheezing or chest congestion without the use of a stethoscope).
- **Indirect auscultation** is listening with the help of a stethoscope.
  - The stethoscope has two end pieces, the diaphragm and the bell.
  - **High-pitched tones** are best heard with the diaphragm of the stethoscope. (e.g., lung sounds, normal heart sounds and bowel sounds).
- **Low-pitched tones** are best heard with the stethoscope’s bell (e.g., abnormal heart sounds and bruit).

- Position the earpieces pointed toward nose.
- Hold the diaphragm firmly against the skin to block out extraneous noise.
- The bell should be place more lightly on the skin.

**Olfaction** is “the use of the sense of smell to gather data about patient’s health”.

- E.g. If the client’s breath has a “fruity” or “acetone” odor, you would suspect ketoacidosis.
- You should assess the urine for ketones.
- You would also ask the client about dietary patterns, because a high protein, high-fat, low-carbohydrate diet can cause a buildup of ketones in the blood.

**Comprehensive Physical Examination**

**A. General survey**

**General survey** is “an overall review and visual observation for the patient from head to toe”, it encompasses the following:

1. Height
2. Weight
3. BMI/Build (thin, obese, etc.). Calculate Body Mass Index (BMI)
   \[ \text{BMI} = \frac{\text{Weight (kg)}}{\text{Height (m)}^2} \]
4. Signs of distress: For example, evidence of cardiac or respiratory distress, pain and anxiety or depression
5. Skin color (Pallor, cyanosis, jaundice, rashes, bruises) or/and obvious lesions.
6. Dress, grooming and personal hygiene (Hair, oral hygiene, nails)
7. Obvious physical deformities
8. Posture, gait and mobility
9. Behavior and manner
10. Odors of body and breath (Alcohol, perfume, infection, poor hygiene.
11. Facial expression

13. Level of consciousness/ awareness

- **Alert** – Patient is awake and aware of self and environment.
- **Lethargy** – Patient open eyes to a loud voice, appears drowsy but opens eye, and responds to questions, then falls back asleep.
- **Obtunded** – Patient opens eyes to loud voice, responds slowly with confusion, seems unaware of environment.
- **Stupor** – Patient arouses from sleep after painful stimuli.
- **Coma** – Patient remains unresponsive to all stimuli with eyes closed.


- Measure the **blood pressure** (Normal pressure range 120/80 ±20/10 mmhg).
- Measure BP bilaterally (Normal variation in reading is about 5 to 10 mm Hg). Use the arm with the highest BP for subsequent BP measurements.
  - Do not use an extremity with a shunt, the same side as a mastectomy, or with an intravenous infusion.

- Count the **pulse**.
  - Assess apical and radial pulses. Note character of pulses (Normally; HR: 60–100 b/m and no arrhythmia).
    - **Fast heart rate due to decreased blood volume, arrhythmia, fever.**
    - **Irregular rhythm with premature beats due to hypoxia, cardiac or electrolyte imbalance.**
  - Count apical and radial heart rates.
    - **Pulse deficit occurs due to premature beats.**

- Measure the **body temperature**.
  - If client is semiresponsive or comatose, shivering, convulsive, take rectal, axillary, or tympanic temperature
  - If rectal temperature is contraindicated or there are signs of increased ICP, use alternate method.
Patient’s Assessment

- Assess **respiratory rate**: Assess rate and character of respiration (Regular rate: 12–20 B/m).
- Assess **Pain** location (Where is it? Does it radiate? Does it occur anywhere else?), quality, timing/onset (When did it begin?), duration (How long does it last?), contributing/associated factors (What other symptoms occur with it?) and severity or intensity (How bad is it?) using pain assessment scales.

### PAIN MEASUREMENT SCALE

![Pain Measurement Scale]

B. **Head-to-Toe Assessment**

- **Skin**.
  - Observe the skin of the face and its characteristics.
  - Identify any lesions, noting their location, distribution, arrangement, type, and color.
  - Inspect and palpate the hair and nails.
  - Continue assessment of the skin while examining the other body regions.

- **Head, Eyes, Ears, Nose, Throat**.
  - **Head**:
    - Examine the hair, scalp, skull, and face.
  - **Eyes**:
    - Check visual acuity and the visual fields.
    - Note the position and alignment of the eyes.
    - Observe the eyelids and inspect the sclera and conjunctiva of each eye.
    - Inspect each cornea, iris, and lens.
    - Compare the pupils, and test their reactions to light.
* **Ears:**
  - Inspect the auricles, canals, and drums.
  - Check auditory acuity.

* **Nose and sinuses:**
  - Examine the external nose; using a light and a nasal speculum, inspect the nasal mucosa, and septum.
  - Palpate for tenderness of the frontal and maxillary sinuses.

* **Throat (or mouth and pharynx):**
  - Inspect the lips, oral mucosa, gums, teeth, tongue, palate, tonsils, and pharynx.

- **Neck.**
  - Inspect and palpate the cervical lymph nodes.
  - Note any masses or unusual pulsations in the neck.
  - Feel for any deviation of the trachea.
  - Inspect and palpate the thyroid gland.

- **Back.**
  - Inspect and palpate the spine and muscles of the back.

- **Posterior Thorax and Lungs.**
  - Inspect and palpate the spine and muscles of the upper back.
  - Inspect, palpate, and percuss the chest.
  - Identify the level of diaphragmatic dullness on each side.
  - Listen to the breath sounds; identify any adventitious sounds.

- **Breasts and Axillae.**
  - In a woman, inspect the breasts with her arms relaxed, then elevated, and then with her hands pressed on her hips.
  - Palpate the breasts, while at the same time continuing your inspection.
  - Inspect the axillae and feel for the axillary nodes.

- **Anterior Thorax and Lungs.**
  - Inspect, palpate, and percuss the chest.
  - Auscultate the heart and lung.

- **Cardiovascular System.**
  - Observe the jugular venous pulsations.
  - Inspect and palpate the carotid pulsations.
  - Listen at the apex of the heart.
  - Listen at each auscultatory area with the diaphragm.
- Listen for any abnormal heart sounds or murmurs.

**Abdomen.**
- Inspect, auscultate, percuss then palpate the four quadrant of the abdomen.
- Palpate the abdomen lightly, then deeply.
- Assess the size of the liver and spleen by percussion and then palpation.
- Palpate and/or percuss for bladder distention.
- Try to feel the kidneys, and palpate the aorta and its pulsations.

**Musculoskeletal System**
- Assess weight bearing, gait, and posture.
- Check extremities for edema.
- Inspect and palpate upper and lower extremities and joints for tenderness, heat, and crepitus.
- Assess muscle development, symmetry and tone.
- Check ROM of lower extremities, equal length of extremities.

**Nervous System.**
* **Mental Status.**
  - Assess the patient’s orientation, mood, thought process, abnormal perceptions, judgment, memory attention, information and vocabulary, and calculating abilities.
* **Cranial Nerves.**
  - Check sense of smell, strength of the temporal and masseter muscles, corneal reflexes, facial movements, gag reflex, and strength of the trapezius and sternomastoid muscles.
* **Motor System.**
  - Assess muscle bulk, tone, and strength of major muscle groups.
  
  Cerebellar function: rapid alternating movements, point-to-point movements, such as finger-to-nose (F → N); gait.
* **Sensory System.**
  - Assess pain, temperature, light touch, vibration, and discrimination.
  - Compare right with left sides and distal with proximal areas on the limbs.
* **Reflexes.**
  - Assess reflexes including biceps, triceps, patellar, Achilles deep tendon reflexes; also Babinski reflex.
Chapter 3
Assessment of the Integumentary System

Objectives

- Define terms related to primary and secondary lesions of the skin.
- Obtain complete health history related to the integumentary system.
- Perform physical examination for the patient’s integumentary system.
- List the diagnostic studies done to diagnose skin diseases.

Disorders of the Integumentary System

Primary Lesions of the Skin

Primary lesion is one that appears in response to some change in the internal or external environment of the skin and is not altered by trauma. It includes:

- **Macule** is a small flat spot or lesion with color change that is not palpable and is <1 cm in diameter.

- **Papule** is a small (<1 cm) superficial, solid elevated that may be pink, tan, red (wart, and mole).

- **Vesicle or blister** is a small fluid-filled bubble that is usually superficial and is <1 cm, (seen in chicken pox, herpes simplex, herpes zoster, 2nd burns).
Patient’s Assessment

- **Bulla** (large vesicle) is a large fluid-filled bubble containing serous or seropurulent fluid that is superficial or deep and is equal or >1 cm.

- **Pustule** is pus containing bubble, less than 1 cm (acne).

- **Wheal** is a firm, elevated and white to pink edematous lesion of irregular shape, (seen in mosquito bite).

- **Patch** is a large spot that is not palpable and that is > 1 cm.

- **Plaque** is a large superficial, solid bump that is elevated (>1cm), seen in psoriasis.

- **Nodule** is a palpable collection of the solid tissue in the skin, (>1cm). It may arise from the skin or tissues under the skin.

- **Lipoma**: Single or multiple tumors of different sizes and comprising fat cells are commonly found on the back of the neck, torso, arms, and legs.

- **Cyst** is a sac containing fluid or semisolid material, >2 cm.
Secondary lesions of the Skin

Secondary lesions may result from changes in primary lesions, or be caused by external sources such as trauma, infection and scratching. It includes:

- **Scale** is fishlike scales that are easily rubbed off the skin’s surface or the accumulation or excess shedding of dead skin (Seen in psoriasis and eczema).

- **Crust** is dried blood, serum, or pus exudates on the skin surface from corrosive lesions (Seen in infectious dermatitis).

- **Excoriation** is a mechanical removal of the epidermis leaving dermis exposed, due to scratching or abrasion.

- **Maceration** is softening and turning white of the skin due to being consistently wet.

- **Fissure** is a vertical, linear crack through the epidermis and dermis; often very painful.

- **Erosion** is a superficial open wound with loss of epidermis or mucosa only.

- **Ulcer** is destruction and partial or complete loss of epidermis, dermis, and possibly subcutaneous layers (seen in pressure ulcer).
- **Scar** is formation of dense connective tissue (surgical incision and healed wound).

- **Atrophy** is a thinning of the epidermal and/or dermal tissue, (Ages skin, striae or stretch marks).

- **Keloid** is hypertrophic scarring because of excess collagen formation; raised and irregular overgrows the original wound boundaries and is chronic in nature.

- **Fibrosis or scleriosis** describes dermal scarring/thickening reactions.

**Vascular Skin Lesions**

- **Petechiae** is a tiny pinpoint reddish purple macule, caused by hemorrhage in the superficial layers of the skin, associated with bleeding tendencies. (Seen in purpura and must be reported immediately).

- **Ecchymosis** is a round or irregular flat purplish bruise beneath the skin (>1 cm), its color changes from black, yellow and green. It is associated with trauma and bleeding tendencies.

- **Cherry Angioma** is a round, red or purple, may blanch with pressure and a normal age-related skin alteration.

- **Spider Angioma** is a spider-like net of tinny blood vessels, appearing under the skin. It is commonly seen on face, neck, arms and trunk. It is associated with liver disease, pregnancy and vitamin B deficiency.
(A) **Health History:**

**Presenting problem:** Ask the patient about

- Changes in the color or pigmentation. Changes in pigmentation may indicate conditions such as vitiligo.
- Changes in the texture of the skin, hair and nails.
- Rashes
- Infections
- Tumors and other lesions
- Dermatitis
- Ecchymosis/Bruises:

- The patient should be questioned about any history of unusual bruising or bleeding which could indicate a problem with clotting disorders. Bleeding from moles should also being noted as this could indicate cancer of the skin.

- Dryness/Sweating: Problems with dry skin or excessive sweating may indicate endocrine disorders. Excessive sweating at night may be indicative of tuberculosis.

- Hair: Ask about any recent changes in color, texture, abnormal loss hair (alopecia): or growth distribution and lesions of scalp.

- Nail changes: Changes in the nails often reflect an underlying systemic problem e.g. Clubbing fingers in patients with COPD.

- The examiner should ask whether symptoms appeared abruptly or seemed to start in a specific area and spread.

**Lifestyle practices**

- Hygienic practices
- Skin exposure/ use of sunscreen

**Nutrition / diet**

- Intake of vitamins and essential nutrients
- Water intake
- Food allergies

**Use of medications**

- Steroids
Patient’s Assessment

- Antibiotics
- Vitamins
- Hormones
- Chemotherapeutic drugs

Past medical history
- Renal and hepatic disease
- Collagen and other connective tissue diseases
- Trauma or previous surgery
- Food, drug or contact allergies

Family medical history
- Diabetes mellitus
- Allergic disorders
- Specific dermatologic problems e.g. psoriasis or skin cancer.

(B) Physical Examination:
- Assessors conduct an examination of the skin as part of a routine assessment, during regular care e.g. during a bed bath, and as needed.
- Wear gloves if the patient has any lesions, complains of itching skin, or if examining mucous membranes.
- Physical assessment of the skin begins with a general inspection followed by a detailed examination.

1. Inspection
- Inspect skin color (Normal skin pigmentation ranges ivory or light pink to ruddy pink in white skin from light to deep brown or black in dark skin. Abnormal findings may be:
  - Pallor
  - Hypopigmentation or white– vitiligo
  - Hyperpigmentation
  - Redness /Erythema
  - Jaundice: Jaundice can indicate biliary tract disease or a liver problem. Pale yellow skin also may occur due to eating excessive amounts of yellow or orange vegetables e.g. carrot due to carotene overload.
- Cyanosis
- Ecchymosis: large diffused bluish black
- Petechiae: small size pinpoint and red.
- Purpura is red to purplish.
- Vascular lesions
  - Hemangiomas
  - Venous stars

**Observe for presence of scars:** Assess for cause, location, appearance (color and size), and degree of tenderness.

**Inspect for lesions:** Note color, location, size, exudates and distribution.

**Assess skin odor** e.g. Alcohol, acetone, ammonia or foul odors.

**Assess nails:** Check for nail bed color, clubbing, and assess capillary refill.

- Nail cyanosis and/or finger clubbing, are signs of chronic tissue hypoxia.
- *Finger clubbing* occurs when the fingers are convex at the bases and touch each other without leaving a space.

- Chronic renal problems can cause the lower half of the nail bed to turn white while the top half remains pink.

- To assess capillary refill: press down on one of the patient’s nails until it pales. Release the nail and observe for the pink color to return. The normal color should return in less than 3 seconds.
Patient’s Assessment

- **Assess hair**: color, distribution, quantity and general condition. Presence of brittle hair or alopecia.

  **Alopecia classification:**
  
a. *Alopecia scaring* (resulting from injury such as burns or radiation, with irreversible damage to the hair follicles).
  
b. *Non-scarring* (resulting from hormonal changes, medications, infectious diseases, or thyroid disease, in which the follicles remain intact with a potential to reverse the process).

2. **Palpation**

  - Palpate for presence of **edema** (pitting or non-pitting).
    - Edematous skin also appears stretched and shiny.

  - Palpate edematous areas to determine mobility and consistency. When pressure from your finger leaves an indentation in the edematous area, it is called *pitting edema*.

  - To assess pitting edema, press the edematous area firmly with the thumb for several seconds and release. The depth of pitting, recorded in millimeters, determines the degree of edema. For example, +1 edema equals 2 mm depth, and +2 edema equals 4 mm.

  - Non-pitting edema usually affects the legs or arms; pressure that is applied to the skin does not result in a persistent indentation. Non-pitting edema can occur in certain disorders of the lymphatic system that may occur after a mastectomy.

  - **Moisture**: (Moisture refers to wetness and oiliness).
    - Use unglove fingertips to palpate skin surfaces and observe for dryness, crusting, and flaking (*Flaking is the appearance of dandruff like flakes when you lightly rub the skin surface, which indicate abnormally dry skin*).
    - *Increased perspiration* is associated with activity, warm environments, obesity, anxiety, or excitement.
- **Dry skin** is normally found in elderly people.
- *Excessively dry skin* can be caused by irritating soap, excessive bathing, or hypothyroidism. Other factors causing dry skin include lack of humidity, exposure to sun, smoking, stress, excessive perspiration, and dehydration. Excessive dryness worsens existing skin conditions.

**Temperature:** Use the back of the hand to assess skin temperature for coolness or warmth.

**Lesions:** Lightly palpate any lesions to detect tenderness, firmness, and depth. Measure length, width, and depth also.

**Texture:**
- Macules are smooth.
- Warts are rough.
- Psoriasis is scaly.

**Turgor:** It is the skin’s elasticity. It diminishes with edema and dehydration.
- To assess skin turgor, pinch fold of skin on the back of the hand for a few seconds then release.

Normally the hydrated, taut skin lifts easily and snaps back immediately to its resting position. The skin stays pinched or tented when turgor is poor due to dehydration.

**Surface Relationship:**
- **Flat** *(non-palpable)*: Macules, patches, purpura, ecchymosis, spider angioma, venous spider.
- **Raised** *(palpable) and solid*: Papules, plaques, nodules, tumors, wheals, scale, crust.
- **Raised and cystic**: Vesicles, pustules, bullae, cysts.
- **Depressed**: Atrophy, erosion, ulcer, fissures.
Laboratory / Diagnostic Studies:

- Blood chemistry / electrolytes: calcium, chloride, magnesium, potassium, sodium
- Hematologic studies
- Skin culture or biopsy
- Skin testing
Chapter 4
Assessment Of Head And Neck

Objectives

- Detect the abnormal findings of the head and neck.
- Perform physical examination for the head and neck.
- Define different terms related to abnormal findings of the head and neck.
- Mention indications of lymph node enlargement.

Assessment of the Head and Neck

Head

Skull and scalp

Normally:
- The skull is round, with prominences in the frontal and occipital area (Normocephalic).
- No tenderness or masses are noted upon palpation of skull or scalp.
- The scalp is free from scars, lesions, lice and/or dandruff.
- Hair distributed covering the whole scalp.
- Hair may be thick or thin, coarse or smooth, neither brittle nor dry.

Abnormal finding:
- Enlarged skull in hydrocephalus.
- Dry, coarse, brittle hair: possible sign of hypothyroidism.
- Alopecia may be psychosomatic or due to drug therapy.
- Unusual hairiness in places other than scalp, eyebrows, and lashes: may indicate hypothyroidism, vitamin A poisoning or chronic infections.
Face

Normally:
- Shape may be oval or rounded.
- Face is symmetrical.
- No involuntary muscle movements.
- Can move facial muscles normally.
- Intact cranial nerve V and VII.

- **CN V (Trigeminal)**
  It is mixed nerve with three sensory branches and one motor branch: the ophthalmic branch supplies the corneal reflex.  
  Function: Chewing movements; corneal and sneezing reflexes; and sensations of face, scalp, and teeth.

- **CN VII (Facial)**
  It is mixed nerve: anterior tongue (2/3 of the tongue) receives sensory supply and motor supply.  
  Function: Facial expression, taste (sugar, salt, sour or bitter), and salivary and lacrimal gland innervation.

Abnormal findings:
- Asymmetry: signs of facial paralysis.
- Twitching: could be due to psychosomatic causes; vitamin/mineral deficiency.

Health Assessment of the Head and Face

(1) **Health history**
- Ask about history of headaches, migraines, trauma, vertigo, dizziness, syncope, lesions, or lumps.
- Ask about history of head injury.

(2) **Physical Assessment**
- **HEAD**
  - Note if the head is normocephalic in shape or if unusual bulges exist or the head is an odd shape.
  - Assess hair for growth, distribution, texture, and presence of lice.
  - Use the fingertips to palpate for any masses of the scalp.
FACE
- Observe for symmetrical facial features.
- Assess Cranial Nerves V and VII.
  - **CN V (Trigeminal)**
    - Ask patient to clench teeth tightly (Observe for lateral jaw deviation).
    - Observe patient during chew with strength and force.
    - Observe for blinking as foreign body touched to cornea (corneal reflex).
  - **CN VII (Facial)**
    - Observe patient’s face at rest and during conversation.
    - Instruct the patient to purse his or her lips and smile.
    - Instruct the patient to puff out his or her cheeks and resist your efforts to collapse them.
    - Ask patient to discriminate different tastes.

Eye

**Anatomy and physiology of eye**

**External Eye**

- **Eyelid:** Distributes tears, limits light entering eye, protects eye. Upper lid covers 2-3 mm of iris but NOT pupil. The lower lid sits directly on the lower ring of the iris.
- **Conjunctiva:** Thin membrane covering most of the anterior surface of eye and eyelid, and protects eye.
- **Lacrimal gland:** Produces tears (drain into lacrimal sac to nasolacrimal duct to nasopharynx).
- **Extra ocular muscles (EOM’s)** are responsible for eye movement.
- EOM’s are innervated by CN III, CN IV, and CN VI.
**Internal Eye**

- **Sclera:** "White of the eye," protective, provides structure. The optic nerve is attached to it at the back of the eye.
- **Cornea:** continuous with sclera, transparent dome shaped window that covers iris, pupil, and anterior chamber. Provides most of the eyes optical power.
- **Aqueous humor:** Fluid that controls pressure inside eye.
- **Iris:** Circular, contractile muscular disc containing pigmented cells. It regulates the light levels inside eye.
- **Pupil:** Center of iris. There are tiny muscles that constrict pupil to light and dilate it in dim light.
- **Lens:** It focuses light on the retina. The lens has ability to change shape and to adjust to close and distant vision. This is called accommodation.
- **Retina:** Sensory network that lines the back of the eye and transforms light impulses to electrical impulses, which travel via optic nerve to cerebral cortex, where they are transformed into images.

**Normally:**
- Eye are symmetrical and in line with each other and non protruding.
- Eye lashes are turned outward.
- Eyelids are equal in movement, and meet completely when eyes are closed.
- Lacrimal gland is normally non palpable.
- No regurgitation from the nasolacrimal duct.
- Conjunctiva is pinkish or red in color and is moist with no ulcers or foreign objects.
- The sclera is clear to pink in color with a shiny appearance. Some capillaries maybe visible in sclera.
- Cornea looks smooth with no irregularities on the surface.
- The cornea is clear or transparent.
- There is a positive corneal reflex.
- Pupillary size ranges from 3 – 7 mm, and are equal in size.
- Pupils are equally round and mid-position.
- Pupil constricts promptly in reaction to light.
- Pupils can accommodate by dilating when looking at distant objects, and constricting when looking at nearer objects.
- The irises should be the same color, size, and shape.
- Normally as eyes shift from a far object to a near object, they move towards the center.

Abnormal Findings:
- **Ptosis** (paralytic drooping of the upper eyelid).
- **chalazion** (a lump of the lid that is caused by obstruction of the drainage duct of an oil gland within the upper or lower eyelid).
- **Aniscoria** (It is a condition characterized by unequal size of the pupils).
- **Strabismus/Squint** (It is failure of the two eyes to maintain proper alignment with each other when looking at object).
- Thick white discharge; may be due to conjunctivitis.
- Bilateral dilation: sign of upper brain stem damage.
- Unilateral dilation and nonreactive: sign of increased intracranial pressure or oculomotor nerve (III) compression from tumor or injury.
- Sluggish reaction or failure to react to light: early warning of deteriorating condition or elevated ICP.
- Lens opacity indicates presence of cataract.
- Yellow sclera: sign of jaundice.
- Corneal edema (very soft, movable mass that looks like raw egg white): frequently occurs in clients who have increased intracranial pressure.
- **Exophthalmos** (*bulging of eyeball*): may be congenital anomaly, sign of congenital glaucoma or thyroid abnormality.

- Leakages of blood outside of the vessels, producing a red area that fades over days to yellow and then disappears indicate subconjunctival hemorrhage.

**Health Assessment of the Eye**

(A) **Health history:**
- Question whether the patient has problems with blurred vision, diplopia, lacrimation, burning, dryness, photophobia, visual loss, color blindness, trauma, infections, edema or cataracts;
- Ask about use of eyeglasses and contact lens.

(B) **Physical assessment:**
- Note visual acuity by observing client performance of activities of daily living.
- Inspect *eye lids* for symmetry and redness.
- Note color, consistency, amount, and origin of *discharge* from eyes.
- Look for excessive tearing or dryness of the eyes.
- Press on the medial, lower orbital rim while looking for abnormal tearing or purulent material being excreted from the inner canthus area.
- Ask the patient to look up as you depress lower lids with thumbs. Inspect the sclera and conjunctiva for color.
- Observe for opacity of lens that may be visible through the pupil. Cataract.
- Direct a penlight from the sides into the eyes. Note whether the *cornea* is clear and intact; assess for lesions or discoloration.
- Observe for foreign bodies and color changes.
- For a rough estimate of *intraocular pressure*, have the patient close the eyes and press lightly on the eyelid over the eyeball. The resiliency of the eyeball should be equal to your own.
- Assess cranial nerves III (Oculomotor), IV (Trochlear), and VI (Abducens).
Examine iris for convergence (the near reaction); ask the patient to look at a distant point in the room and observe his/her ability to focus on one point effectively. Assess for symmetrical movement.

Test the pupillary reactions to light. In a darkened room, direct the light into each eye while the other is closed or covered and observe for pupil constriction. Normally; pupils constrict and remain constricted with light; pupils dilate when light is removed.

Nose and Paranasal Sinuses

Normally:
- Nose in the midline with no discharges.
- Both nares are patent and patient can breathe with mouth closed.
- No bone and cartilage deviation noted on palpation.
- Nasal septum in the mid line and not perforated.
- The nasal mucosa is pinkish to red in color. (Increased redness are typical of allergy).
- No tenderness noted on palpation of the paranasal sinuses.

Abnormal findings:
- Excessive buildup of mucous secretions.
- Breathing through the mouth only: indicate nose occlusion. It may be due to deviated nasal septum, swelling of the nasal turbinates, or excessive mucus secretions.
- Cerebrospinal fluid leak (fluid tests positive for glucose with Lab. stick).
- Copious, watery-to-thick, mucopurulent discharge: may be due to acute rhinitis.
- In viral rhinitis the mucosa is reddened and swollen; in allergic rhinitis it may be pale, bluish, or red.
- Local tenderness, together with symptoms such as pain, fever, and nasal discharge, suggest acute sinusitis involving the frontal or maxillary sinuses.

**Health Assessment of the Nose and Paranasal Sinuses:**

(A) **Health History:**
- Ask about history of rhinitis, sinusitis, abnormal or absent sense of smell, obstruction, epistaxis, trauma, and excessive sneezing.

(B) **Physical assessment:**
- Inspect the *external nose* for deviation in shape, size, color, and the presence of nasal discharge.
- Inspect for amount, color, and consistency of drainage.
- Tilt the head back and examine the nares for redness, or foreign bodies.
- Palpate the nose for masses or deviations.
- Check for sense of smell.
- Test for nasal obstruction. Occlude one nostril and have the patient breathe in and out while assessing for obstruction.
- Inspect nasal mucosa for areas of irritation, swelling, bleeding and lesions.
- Palpate and precuss *maxillary sinuses* (under the cheekbones) and *frontal sinuses* (just superior to the medial and inner eyebrow area) for tenderness and masses.

**Mouth**

*Normally:*
- Lips are with visible margin.
- Lips are pinkish in color.
- Gums are pinkish in color with no bleeding.
- Tongue is pinkish with white taste buds on the surface, with no lesions noted.
- Gag reflex is present.
- Able to move the tongue freely and with strength.
- Uvula is pinkish to red in color and positioned in the midline.
- No swelling or lesion noted in uvula
- Uvula moves upward and backwards when asked to say “ah”

**Abnormal findings:**
- Asymmetric protrusion suggests a lesion of Cranial Nerve XII
- Redness of gum indicates gingivitis.
- Dehydrated mouth or lips.
- Mouth fissures.
- **Candidias** is (a fungal infection indicated by white patches).

- In Cranial Nerve X paralysis, the soft palate fails to rise and the uvula deviates to the opposite side.

**Health Assessment of the Mouth**

**Physical assessment**
- Inspect the gums, tongue and oral mucosa for color and texture.
- Ask the patient to put out his or her tongue. Inspect it for symmetry—a test of the hypoglossal nerve (Cranial Nerve XII).
- Inspect the soft palate, uvula, tonsils, and pharynx. Note their color and symmetry and look for swelling, ulceration, or tonsillar enlargement.

**Ear**

**Anatomy and physiology of ear**

- **External Ear**
  - Auricle (Pinna): varies in size and shape.
  - External auditory canal: 2.5-3cm length.
  - It consists of bone and cartilage covered with thin sensitive skin.
Patient’s Assessment

- Mastoid process: bone behind and below the ear canal (mastoid part of temporal bone).

❖ Middle Ear
- Air filled cavity in temporal bone separated from external ear by tympanic membrane.
- Sound transmitted by 3 tiny bones (ossicles): malleous, incus, stapes.
- Eustachian tube leads to nasopharynx allows for equalization of air pressure with atmospheric pressure.

❖ Inner Ear
- A curved cavity within a bony labyrinth.
- Consists of a vestibule, semicircular canals, and cochlea.
- Cochlea contains the organ of corti which transmits sound impulses to the Cranial Nerve VIII (Acoustic).

[It is a sensory nerve with two divisions: hearing and semicircular canals. It transmits sound (hearing) and equilibrium (balance) information from the inner ear to the brain].

Normally:
- The top of the ear should line up with the outer corner of the eye.
- The ear lobes are bean shaped, parallel, and symmetrical.
- There is no pain or tenderness on the palpation of the auricles and mastoid process.
- The ear canal has normally some wax (cerumen) of inspection.
- On otoscopic examination the tympanic membrane appears intact, flat, and gray in color with no scarring.

Abnormal finding:
- Low set ears can indicate congenital problems such as Down’s syndrome.
- Abnormal sounds in the ears (ringing or buzzing) may be caused by ototoxic drugs.
- Bulging, red tympanic members can indicate otitis media.
- Bulging membrane may indicate increased pressure in middle ear.
- Depressed membrane may indicate vacuum due to blocked Eustachian tube.
- **Battle’s sign (ecchymosis behind the ear)** may be sign of basilar skull fracture.
- Redness, swelling, and pain may be signs of otitis externa.
- Cerebrospinal fluid leak: may due to head injury.
- Serosanguineous or purulent drainage may indicate perforation of tympanic membrane.
- Deafness or impaired hearing.

**Health Assessment of the Ear**

*(A) Health history:*
- Ask about problems with decreased hearing, tinnitus, pain, discharge, previous infections.
- Assess for use of prosthetic devices.
- Ask about antibiotics intake.

*(B) Physical assessment:*
- Note auditory acuity by asking client to indicate if he or she hears normal sounds as you make them.
- Inspect the pinna for areas of abnormalities.
- Note color, quantity, and consistency of any discharge from the ears.
- Palpate auricle for masses. Note exact size, color, and location.
- Insert an otoscope slowly into the external ear canal until the tympanic membrane is visualized and observe for cerumen (color and amount) and observe the eardrum for color and integrity.
- Assess Cranial Nerve VIII using tuning fork.
- Palpate the temporomandibular joint by placing your index finger over the front of each ear as you ask the patient to open and close the mouth.
Patient’s Assessment

Neck

Normally:
- No visible mass.
- No jugular venous distension.
- The trachea is palpable.
- Lymph nodes in neck may or may not be palpable (up to 3 mm in diameter).
- Lymph nodes are firm with smooth rounded surface, lightly movable and non tender if palpable.

Abnormal finding:
- Tender or enlarged nodes: may be sign of systemic infection.

Thyroid

Normally:
- The thyroid normally is not enlarged and non palpable.
- Isthmus maybe visible in a thin neck.
- No nodules in thyroid are palpable.

Abnormal findings:
- Enlarged: may be due to hyperactive thyroid, malignancy, and goiter.

Health Assessment of the Neck

(A) Health history:
- Collect data about any problems with swelling, enlargement of lymph nodes, goiter, stiffness and limitations of movement, tenderness and any thyroid concerns.

(B) Physical assessment:
- Assess range of motion of neck.
- Note any lesion or swelling in the neck.
- Assess jugular venous distention while patient is at 30-45 degree angle.
  - JVD is an indication of increased central venous pressure as found in Rt. HF or fluid overload.
- Have the patient rotate the head and shrug the shoulders against resistance to test Cranial Nerve XI.
  - Limitations of motion can indicate acute or chronic cervical spine problems.
- Palpate the trachea from behind using the pads of fingers; it should be in the midline without deviation.
- Palpate the thyroid for masses.
- Palpate the pre- and postauricular lymph nodes (anterior and posterior to the ear), occipital, cervical, submandibular and submental (under the chin) lymph nodes for tenderness and swelling using the finger pads in a slow, circular motion.

**Indications of lymph node enlargement:**
- **Submandibular:** Infections of head, neck, sinuses, ears, eyes, scalp, pharynx.
- **Submental:** Cytomegalovirus, toxoplasmosis, dental problem.
- **Jugular lymph node:** Pharyngitis, rubella.
- **Posterior cervical:** Tuberculosis, lymphoma, head and neck malignancy.
- **Preauricular:** External auditory canal infection.
- **Suboccipital:** Local infection.
- **Postauricular:** Local infection.
- **Right supraclavicular:** Lung, retroperitoneal or gastrointestinal cancer.
- **Left supraclavicular:** Lymphoma, thoracic or retroperitoneal cancer, bacterial or fungal infection.
Chapter 5
Nervous system assessments

Objectives

- List the components of neurological assessments.
- Obtain complete neurological health history.
- Perform mental status assessment.
- Perform cranial nerves assessment.
- Perform motor and sensory system assessment.
- Mention the light and deep tendon reflexes.
- Mention diagnostic studies for the neurological system assessment.

Nervous system Assessment

(A) Health History Assessment (Subjective data)

A neurological health history can be obtained if the patient is alert and oriented to person, place, and time.

If the person appears to be disoriented or confused upon questioning, ask family members and friends to confirm the information.

- Past Health History.
  - Ask about history of seizures, loss of consciousness, anesthesia (an absence of normal sensation – especially to pain), paresthesia (numbness and tingling; a “pins and needles” feeling), neuralgia, twitches, tremors, personality changes, memory deficits, mental deterioration, nervousness, anxiety, vertigo, phobia, and/or insomnia.
  - Ask about previous hospitalizations for neurologic problems.

- Medications.
  - Obtain a careful medication history, especially the use of sedatives, opioids and tranquilizers. Many other drugs can also cause neurologic side effects.
• **Surgery or other Treatments.**
  - Inquire about any surgery involving any part of the nervous system, such as head, spine, or sensory organs.

• **Functional Health Patterns.**
  **Nutritional-Metabolic Pattern.**
  - Ask about problems related to chewing and swallowing.
  - Ask about intake of vitamins such as B1, niacin, and B6. "Deficiencies in one or more of these vitamins could result in complaints as depression, apathy, neuritis, weakness, mental confusion, and irritability".

  **Elimination Pattern.**
  - Determine if the bowel or bladder problem (e.g. incontinence of urine and feces and urinary retention) was present before or after the neurologic event.
  - Bowel and bladder problems are often associated with neurologic problems such as stroke, head injury, spinal cord injury, multiple sclerosis, and dementia.

• **Activity-Exercise Pattern.**
  - Assess the person’s activities of daily living, since neurologic diseases can affect the ability to perform motor tasks.

  **Sleep-Rest Pattern.**
  - Carefully assess and document the patient’s sleep pattern and bedtime routines.
  - Sleep pattern alteration can be both a cause and a response to neurologic problems.

• **History of present illness.**
  - Ask about current symptoms; aggravating and alleviating factors, timing, severity, and useful data related to associated symptoms.
  - Ask about risk factors such as family history, diet, exercise, sedentary lifestyle, caffeine intake, and recent stressors.

(B) **Physical Assessment (objective data)**
A complete neurologic assessment consists of five steps:
  1) Mental status exam
  2) Cranial nerve assessment
  3) Motor system assessment
  4) Sensory system assessment
  5) Reflex testing
Mental Status Exam

The mental status exam assesses the patient's cerebral function (Speech, problem solving, and memory).

- **Assess level of consciousness (LOC).**
  - Use Glasgow Coma Scale (GCS) for measurement of LOC.
  - Quick neurological
    - Normal: 14-15 – conscious
      1. Lethargy 13-11
      2. Stupor 10-8
      3. Coma = 7
      4. Deep coma = 3

- Apply painful stimuli. Normally, patient tries reaching out or trying to stop pressure.
  - Abnormal response is that;
    - Patient does not localize or withdraw from painful stimuli.
    - Patient assumes **decorticate posturing** (legs extended; feet extended with plantar flexion; arms internally rotated and flexed on chest).
    - Patient assumes **decerebrate posturing** (arms stiffly extended and hands turned outward and flexed; legs extended with plantar flexion) may be due to lesion in pons, or midbrain.
    - Patient assumes **flaccid posturing** (no motor response).
- Observe patient’s speech and language abilities during the neurological assessment.
  
  ❖ **Aphasia, dysphasia** *(Loss of or impaired language [comprehension, expression, or both])* indicates left cerebral cortex lesion.
  
  ❖ **Dysarthria** *(Lack of coordination in articulating speech)* indicates cerebellar or cranial nerve lesion, anti-seizure drugs, sedatives, hypnotic drug toxicity (including alcohol).

**Assess orientation**: Assess time, place, and person.
  
  ❖ Patients with organic brain disorders lose time first, then place, rarely person.

**Assess attention span**: Patient should be able to focus on examiner’s questions and respond.
  
  ❖ Attention span is impaired in anxiety, fatigue, and intoxication.

**Assess memory**:
  
  a. **Recent or short term memory**: Ask for 24 hours diet recall and other easily verifiable information.
     
     ❖ Short term memory is impaired in Alzheimer’s.
  
  b. **Remote or long term memory**: Ask for past health, birthdays, relevant history.
     
     ❖ Long term memory is lost in Alzheimer’s, cortical injury, but not in normal aging.

**Assess judgment**:
  
  - Ask questions such as “What would you do if your house caught fire?”
     
     ❖ Judgment is impaired in mental retardation, emotional dysfunction, schizophrenia, and organic brain disease.

**Assess perception**:
  
  ❖ **Visual hallucinations** are often associated with medications and organic syndromes.
  
  ❖ **Auditory hallucinations** are associated more with psychiatric disorders.

- **Cranial Nerve Assessment**

  - **Cranial Nerve I (Olfactory)**
    
    - Ask patient to close eyes, obstruct one nare and determine the nature of smell using common, easily identifiable substances such as coffee, toothpaste, orange, vanilla or soap.
- **Bilateral decreased sense of smell** occurs with age, tobacco smoking, allergic rhinitis, cocaine use.

- **Unilateral loss of sense of smell** (neurologic anosmia) can indicate a frontal lobe lesion.

- **Cranial Nerve II (Optic)**
  - Check visual acuity and visual fields for each eye.
  - To test visual field:
    - Examine each eye independently.
    - Position yourself opposite the patient and ask him or her to look directly at the bridge of your nose and indicate when an object (finger, pencil tip) presented from the periphery of each of the visual fields is seen.
  - Test visual acuity by asking the patient to read newspaper.
  - **Unilateral blindness** can indicate a lesion or pressure in the globe or optic nerve.
  - **Hemianopsia** (one half of the visual field is affected) or **quadrantanopsia** (one fourth of the visual field is affected) can indicate a lesion of the optic tract as in a cerebrovascular accident (CVA).

- **Oculomotor (CN III), Trochlear (CN IV) and Abducens (CN VI)**
  - Note: Cranial Nerves III, IV, and VI are examined together because they control eyelid elevation, eye movement, and pupillary constriction.
  - Assess eye lid for presence of ptosis.
  - Ask the patient to follow the movement of your finger or pen only with the eyes. Move the target to each of the six positions (right and up, right, right and down, left and up, left, left and down).
  - Assess pupillary constriction to light reflex and accommodation (pupils constricting with near vision).
  - Abbreviations commonly used to record the reaction of the pupils is **PERRLA** (Pupils are Equal, Round, and Reactive to Light and Accommodation).
  - A unilaterally dilated pupil with unilateral absent light reflex and/or if the eye will not turn upwards could indicate an internal carotid aneurysm or increased intracranial pressure.
- If the eyes will not do this the patient may have a fracture of the eye orbit or a brain stem tumor.

- **Cranial Nerve V (Trigeminal)**
  Motor – Palpate jaws and temples while asking patient to clench teeth.
  - Assess corneal reflex.
  Sensory – Have patient close eyes, touch cotton ball or pinprick to all areas of face.

- **Unilateral deficit seen with trauma and tumors.**

- **Cranial Nerve VII (Facial)**
  Motor - Note symmetry and mobility of face by asking the patient to raise the eyebrows, close the eyes tightly, purse the lips, draw back the corners of the mouth in an exaggerated smile, and frown.
  Sensory - Assess the patient’s ability to discriminate taste (sugar, salt, lemon juice).

- **An asymmetrical deficit can be found in trauma, CVA, tumor, and inflammation.**

- **Cranial Nerve VIII (Acoustic or Vestibulo-cochlear)**
  - Use tuning fork to test hearing acuity.
    - Impairment of hearing acuity indicates inflammation or occlusion of the ear canal, drug toxicity, or a possible tumor.

- **Cranial Nerve IX (Glossopharyngeal) and X (Vagus)**
  - Depress the tongue with a tongue blade and have the patient say “ahh” or yawn. Uvula and soft palate should rise and the voice should be clear.
  - Test the gag reflex (bilateral contraction of the palatal muscles) by touching the sides of the posterior pharynx or soft palate with a tongue blade.
    - Deficits can indicate a brain stem tumor or neck injury.

- **Cranial Nerve XI (Spinal Accessory)**
  - Have the patient rotate the head and shrug shoulders against resistance.
    - If the patient is unable to do this it may indicate a neck injury.

- **Cranial Nerve XII (Hypoglossal)**
  - Ask the patient to protrude the tongue. It should protrude in the midline.
    - Deviation to one side and tremors can indicate a lower or upper motor neuron lesion.
Motor System Assessment

Assessment of the motor system includes evaluation of bilateral muscle strength, tone, symmetry, coordination and balance tests.

- Test the **strength** by asking the patient to push and pull against the resistance of your arm as it opposes flexion and extension of the patient’s muscle. Note any weakness or asymmetry of strength between the same muscle groups of the right and left sides.

  - **Hemiplegia** (Paralysis on one side of body) indicates stroke and other lesions involving motor cortex.

  - **Apraxia** (Inability to perform learned movements despite having desire and physical ability to perform them), indicates cerebral cortex lesion.

- Test muscle **tone** by passively moving the limbs through their range of motion. There should be a slight resistance to these movements.

  - Abnormal tone is described as:

    - **Hypotonia** (flaccidity)
    - **Hypertonia** (spasticity)
    - **Dystonia** (impairment of muscle tone).

- Note any involuntary movements such as tremor, **myoclonus** (spasm of muscles), and **chorea** (involuntary, purposeless, rapid motions).

Test cerebellar function and assessing **balance** and **coordination**, perform the **Romberg test**. With the feet together and arms to the sides as if standing at attention, instruct the patient to maintain this position for about 30 seconds with the eyes open then closed. It is normal to see minimal swaying.

  - **Ataxia** (Lack of coordination of movement. The patient is able to maintain his balance with the eyes open but not with them closed) indicates lesions of cerebellum, anti-seizure drugs, sedatives, hypnotic drug toxicity (including alcohol).

- Also to test coordination, perform **finger-to-nose test** by asking the patient to close the eyes and touch the finger to the nose.

Sensory System Assessment

- Instruct the patient to keep his eyes closed during all the tests.
- Compare one side with the other.
- Light **touch** is tested using a cotton wisp or light pin prick. Gently touch each of the four extremities and ask the patient to indicate when he or she feels the stimulus.
- **Anesthesia** *(Absence of sensation)* indicates lesions in spinal cord, thalamus, sensory cortex, or peripheral sensory nerve or specific medications intake.

- **Paresthesia** *(Alteration in sensation)* indicates lesions in the sensory cortex.
  - Test *pain* by alternately touching the skin with a pin. Evaluate each limb separately.

- **Analgesia** *(Loss of pain sensation)* indicates lesion in thalamus or specific medications intake.
  - Assessment of sensation of **temperature** can be tested by applying warm and cold water to the skin and asking the patient to identify the stimuli with the eyes closed.
  - Assess **vibration** sense by applying a vibrating tuning fork to the fingernails and the bony prominences of the hands, legs, and feet, and ask the patient if the vibration is felt.
  - Assess **position** sense *(proprioception)* by gently moving patient's digit up or down. Ask the patient to indicate the direction in which the digit is moved.
  - Another test of **proprioception** is the **Romberg test**. Ask the patient to stand with feet together and then close his or her eyes.
    - *If the patient is able to maintain balance with the eyes open but sways or falls with the eyes closed (i.e., a positive Romberg test), this indicates vestibule-cochlear dysfunction.*

- **Reflex Testing**

  - Common reflexes that may be tested include the deep tendon reflexes (biceps, brachioradialis, triceps, patellar, and ankle reflexes) and superficial reflexes (e.g. corneal, gag or swallowing and, plantar reflexes or Babinski response).
  - A patient with multiple sclerosis might have hyperactive reflexes.
  - **Areflexia** *(absence of reflexes)* can appear in Guillain-Barre syndrome.
  - Depressed or hyperactive reflexes can also signal an electrolyte imbalance.

  - The plantar reflex is elicited by stroking the lateral side of the foot with a tongue blade or the handle of a reflex hammer.
  - Stimulation normally causes toe flexion. Toe fanning indicates positive Babinski.
Diagnostic Studies for the Neurological System

a. Cerebrospinal Fluid Analysis
   - Lumbar puncture

b. Radiology
   - Skull and spine x-rays
   - Cerebral angiography
   - Computed tomography (CT) scan
   - Magnetic resonance imaging (MRI)
   - Magnetic resonance angiography (MRA)
   - Myelogram

c. Electrographic Studies
   - Electroencephalography (EEG)
   - Magnetoencephalography (MEG)
   - Electromyography (EMG) and nerve conduction studies
   - Evoked potentials

d. Ultrasound
   - Carotid duplex studies
   - Transcranial doppler
Chapter 6
Assessment of The Respiratory System

Objectives

- Obtain complete respiratory system health history.
- Perform respiratory system physical assessment.
- Describe the abnormal lung sounds.
- Differentiate between different percussion sounds detected on the normal and abnormal lung.
- Define the different terms related to abnormal respiratory characteristics.
- Mention the diagnostic studies used for respiratory system assessment.

Assessment of the Respiratory System

(A) Taking a Respiratory History

□ Personal and social history
- Age.
- Smoking.
  - No of packs per day.
  - Years of smoking.
  - Exposure to secondhand smoke.
  - History of attempts to quit, methods and results.
- Ask about possible precipitating factors or triggers such as medications, pollen, smoke, mold, or pet exposure.
- Sedentary lifestyle or immobilization
- Environmental toxic exposure “air pollution, pesticides, smoke”
- Occupation: “coal, dust, insecticides.”
**Patient’s Assessment**

**Past Health History**
- Determine frequency of respiratory problems (e.g., colds, sore throats, sinus problems, allergies).
- Document characteristics and severity of the allergic reaction such as runny nose, wheezing, scratchy throat, or chest tightness.
- Inquire about a past history of respiratory problems, such as asthma, COPD, pneumonia, and tuberculosis (TB).
- Ask about a history of additional health problems e.g. heart failure.

**Chief complaint / Present illness**
- Ask about presence of any of the following respiratory symptoms: cough, sputum production, dyspnea, hemoptysis, chest pain, wheezing and sleep apnea.
  - Sleep Apnea *is the cessation of airflow for more than 10 seconds more than 10 times a night during sleep. It is caused by airway obstruction (e.g. obesity with upper narrowing, enlarged tonsils, pharyngeal soft tissue changes in acromegaly or hypothyroidism).*
- Ask about any recent changes in exertional capacity, fatigue, and/or a history of night sweats, or hand or leg swelling.
  - If a cough is present;
    - Determine if a cough is acute or chronic (longer than 3 weeks in duration).
    - Evaluate whether the cough is productive or nonproductive of secretions.
      - Dry cough indicates airway irritation or obstruction
      - Harsh cough suggests upper airway obstruction related to subglottic edema.
  - If the patient has a productive cough,
    - Evaluate the following characteristics of sputum: amount, color, consistency, and odor. The normal color is clear or slightly whitish.
      - If a patient is a cigarette smoker, the sputum is usually gray.
      - The patient with COPD may exhibit clear, whitish, or slightly yellow sputum, especially in the morning on rising.
      - Yellow-green colored sputum may indicate a bacterial infection and rust-colored sputum is characteristic of pneumonia.
      - Frothy sputum is seen in pulmonary edema.
- Hemoptysis (sputum with blood) is seen on TB, PE and lung cancer.

- If patient complain of chest pain;
  - Is the chest pain with breathing?
  - If so, what is the pain like, when does it occur, and what relieves it?
  - If patient experiencing dyspnea;
  - Ask, does shortness of breath occur at rest or with activity?
  - Ask the patient if shortness of breath impacts activities of daily living?
  - Ask; does the patient use pillows to help easier breathing?
  - Ask if the patient has any allergies that affect breathing?

- Medications
  - Ask about both prescription and over-the-counter medications.
  - Assess for overuse of short-term bronchodilators.
  - Inquire about the use of an angiotensin-converting enzyme (ACE) inhibitor, since cough is a relatively common side effect of these drugs.
  - Ask the patient whether or not he or she has had an annual flu immunization and pneumonia vaccine.

- Family history
  - Do you have a family history of asthma, tuberculosis, lung cancer, chronic bronchitis, emphysema, or any other lung disease?

(B) Physical examination:

- Inspection
  - Look for symmetry of chest wall movement.
  - Observe the duration of the inspiratory/expiratory cycle.
  - Prolonged expiration occurs with difficulty expelling air, as is often seen in patients with emphysema.
  - Assess the patient's respiratory characteristics.
  - (In a healthy adult, a respiration is regular, between 12 and 20 times per minute).

- Tachypnea is rapid, shallow breathing and is seen in patients with restrictive lung disease such as kyphosis, and in situations where pleuritic chest pain prohibits full expansion of the chest wall.
**Patient's Assessment**

- **Hyperpnea or hyperventilation** is a rapid deep breathing, occurs as a result of physical exercise, anxiety, and metabolic acidosis.

- **Kussmaul respiration**: It is characterized by deep breathing, occurs in patients with diabetic acidosis and coma.

- **Bradypnea** is a slow respiratory rate than normal, and is seen in patients with drug-induced respiratory depression, and increased intracranial pressure.

- **Cheyne-Stokes respiration** occurs when there are periods of deep breathing alternating with periods of apnea. It may be seen in a patient with heart failure, drug-induced respiratory depression, uremia, or brain damage.

  - Observe patient's position during respiration.
  - **Orthopnea** is inability to breathe in laying position.
  - Observe color of skin, lips, nails and tongue.

- **Central cyanosis**: Blue discoloration seen in the tongue present in COPD patient with cor-pulmonale and massive pulmonary embolism due to abnormal amount of deoxygenated hemoglobin in arteries.

- **Peripheral cyanosis**: Blue discoloration seen in the lips mucous membrane, occurs when oxygenated blood supply to a certain part of body is reduced. It is seen with all causes of central cyanosis, with exposure to cold, left ventricular failure and shock.

  - Look to see if the patient uses accessory muscles of respiration, neck, shoulder, or abdominal muscles.
  - Observe for intercostal retractions, nasal flaring, or pursed lip breathing, all of which indicate airflow obstruction and poor ventilation.
- Pursed-lip breathing (exhalation through mouth with lips pursed together to slow exhalation) indicates COPD, asthma and suggests increase breathlessness.

- Look at the patient's posture.
  - A patient with COPD will lean forward to improve breathing.

- Inspect the chest wall for deformities as:
  - **Kyphosis**: Abnormal curvature of the spine- anterior-posterior.

  - **Scoliosis**: Lateral curvature of thoracic spine.

- **Barrel chest**: Increasing the anteroposterior diameter of the chest; typical of hyperinflation seen in COPD.

- **Funnel chest**: Depression of the lower portion of the sternum.

- Observe the patient's level of consciousness.
  - Confusion or changes in mental status are important signs of potential respiratory problems.

- Assess patient's ability of doing activities of daily life (ADL) and climbing stairs.
- Observe patient’s finger nails for clubbing.
  - **Clubbing fingers** is a sign indicating hypoxia as seen in COPD.
Palpation
- Assess Symmetry of chest expansion at the level of the diaphragm.

Unequal expansion occurs when air entry is limited by conditions involving the lung (e.g., atelectasis, pneumothorax) or the chest wall (e.g., incisional pain).

Percussion
- Perform chest percussion to assess the density or aeration of the lungs.
  - **Resonant sounds** are low pitched, hollow sounds heard over normal lung tissue.
  - **Hyperresonant sounds** that are louder and lower pitched than resonant sounds, and are normally heard when percussing lungs hyperinflated with air, such as with COPD, or acute asthma.
  - **Tympanic sounds** are hollow, high, drum-like sounds. It is normally heard over the stomach or intestine or pneumothorax.
  - **Dull sounds** are normally heard over dense areas such as the heart or liver, or when fluid or solid tissue replaces air-containing lung tissues, such as occurs with pneumonia, pleural effusions, or tumors.
  - **Flat sounds** are normally heard over solid areas or very dense tissue such as posterior chest below level of diaphragm or bones.

Normally, upper level of liver dullness is 6th rib in right mid-clavicular line. If chest is resonant below this level, it is a sign of hyperinflation usually due to emphysema.
Auscultation
- Use the diaphragm of stethoscope to listen to breathe sound in each area of the lung while instructing the patient to breathe slowly and deeply through the mouth.
- The breath sounds are assessed for:
  - Duration (how long the sound lasts).
  - Intensity (how loud the sound is).
  - Pitch (how high or low the sound).
  - Timing (when the sound occurs in the respiratory cycle).

- Normal breath sounds are classified as bronchial, bronchovesicular, and vesicular sounds.
  ✓ Bronchial sounds are present over the large airways in the anterior chest.
    Bronchial sounds are loud and high in pitch and resemble air blowing through a hollow pipe; expiratory sounds last longer than inspiratory sounds.
  ✓ Bronchovesicular sounds are heard in the posterior chest between the scapulae and on either side of the sternum in the anterior chest.
    Bronchovesicular sounds are medium pitch and intensity and softer than bronchial sounds. Bronchovesicular sounds are about equal during inspiration and expiration.
  ✓ Vesicular sounds are soft, blowing, low pitched sounds normally heard throughout most of the lung fields.
    Vesicular sounds are normally heard throughout inspiration, continue without pause through expiration.

Normally in air-filled lung, vesicular sounds are heard over most of the lung fields, bronchovesicular sounds are heard between the 1st and 2nd interspaces on the anterior chest and bronchial sounds are heard over the body of the sternum.

- Reduced breath sounds occur in: chronic airflow limitation (especially emphysema), pleural effusion, pneumothorax, pneumonia, large neoplasm and pulmonary collapse.
- Absent breath sounds over areas of the lung occurs in pleural effusion, mainstem bronchi obstruction, atelectasis, pneumonectomy and lobectomy.
Abnormal (adventitious) Breath Sounds
- The term “adventitious” breath sounds refers to additional sounds that are heard over normal breath sounds, that include: crackles (or rales), wheezes, rhonchi (low pitched wheezes), pleural friction rubs and stridor.

✓ **Wheezes** are high pitched, musical sounds that are heard continuously during expiration, but possibly on both inspiration and expiration as obstruction of airway increases. They are caused by narrowed or obstructed air moving through airways by constriction or swelling of airway or partial airway obstruction (Possibly audible without stethoscope).
  - Wheezes may occur with bronchospasm (caused by asthma), airway obstruction (caused by foreign body or tumor) or COPD and bronchitis.

✓ **Rhonchi** is a low pitched, continuous, snoring sounds caused by obstruction of large airways (trachea, bronchi) with secretions Most prominent on expiration. The sound usually clears after coughing or suctioning.
  - Rhonchi occur in COPD, chronic bronchitis and pneumonia.

✓ **Stridor** refers to high pitch, continuous musical or crowing sound of constant pitch. It is caused by partial obstruction of upper airway (larynx or trachea) and thus requires immediate attention. It is best heard louder over the throat.
  - Stridor is a sign of croup, laryngeal spam, epiglottitis, vocal cord edema after extubation, or presence of foreign body.

✓ **Crackles** (or rales) are referred to as discontinuous sounds; they are intermittent, nonmusical and brief sound. The sounds produced are created when air is forced through respiratory passages that are narrowed by fluid, mucus, or pus.
Crackles caused by pulmonary fibrosis, atelectasis, heart failure (HF), chronic bronchitis, severe congestion or pneumonia.

Pleural friction rubs are grating sound from roughened inflamed pleural surfaces rubbing together. Evident during inspiration, expiration, or both and no change with coughing. Usually uncomfortable, especially on deep inspiration. A pleural rub stops when breathing stops.

Pleural friction rubs indicating pleurisy, pneumonia, pulmonary infarct.

Diagnostic Studies of Respiratory System

- Sputum examination: Including culture and sensitivity, cytology…… etc.
- Chest X-ray
- Skin Test: to test for allergic reactions or exposure to TB bacilli or fungi. Skin tests involve the intradermal injection of an antigen. The test is read 48 to 72 hours after injection. Positive test is induration of 10 mm or more.
- Computed Tomography (CT Scan)
- Magnetic Resonance Imaging (MRI)
- Oximetry: Normal SpO2 = 95% - 100%.
- Bronchoscopy
- Biopsy of the Lungs
- Arterial Blood Gases (ABGs)
- Pulmonary Function Tests: measure lung volumes and airflow.
- Lung Scan: Procedure using inhalation or I.V. injection of a radioisotope, then, imaging of distribution and blood flow in the lungs. (Measure blood perfusion) to confirm pulmonary embolism or other blood flow abnormalities.
- Pulmonary Angiography: Used to visualize pulmonary blood vessels and locate obstruction or pathologic conditions (e.g., pulmonary embolus).
- Ventilation - Perfusion Scan
- Thoracentesis: It is the insertion of a large-bore needle through the chest wall into the pleural space to obtain specimens for diagnostic evaluation.
Objectives

- Obtain complete cardiovascular system health history.
- Perform cardiovascular system assessment.
- Describe the difference between pains of angina pectoris, myocardial infarction.
- Mention the diagnostic studies used for cardiovascular system assessment.

Assessment of the Cardiovascular System

(A) Obtaining health history:

- **History of Present Illness**
  - Ask the patient what problem has brought him or her to the hospital.
  
  **Common Clinical Manifestations of Cardiovascular Disorders include:**
  - Dyspnea (exertional, orthopnea, paroxysmal nocturnal dyspnea).
  - Chest Pain
  - Edema/Ascites
  - Palpitation
  - Fatigue
  - Syncope and Fainting
  - Cyanosis
  - Clubbing of fingers

  - Ask questions to assess chest pain.
    - Where is the location of pain on the chest?
• What does the pain feel like? (Pressure, heaviness, burning).
• How severe is it on a scale of 0 to 10?
• What causes the pain? (Exertion, stress).
• Does anything relieve it? (Rest, nitroglycerin).
• Does it spread to other sites? E.g. shoulder or jaw.
• How long does the pain last?
• Do you have any additional symptoms? (Shortness of breath, palpitations, dizziness, sweating).

Angina pectoris:
- Characteristics: Substernal pain may spread widely throughout chest. Pain in shoulders and hands may be present.
- Duration: 5–15 min
- Precipitating factors: exertion, emotion, heavy eating, and cold.
- Relieving measures: Rest, nitroglycerin, oxygen.

Myocardial infarction:
- Characteristics: Substernal or retrosternal pain spreading across chest; may radiate to inside of arm, neck, or jaw.
- Duration: >15 min
- Precipitating factors: Occurs spontaneously but may be sequel to unstable angina.
- Relieving measures: Morphine sulfate, successful reperfusion of blocked coronary artery.

Esophageal Pain (Hiatal hernia, reflux esophagitis/spasm)
- Characteristics: Substernal pain; may be projected around chest to shoulders.
- Duration: 5–60 min
- Precipitating factors: Recumbency, cold liquids, exercise.
• **Social history and habits**
  - Ask the patient about the presence of major cardiovascular risk factors.
    A. **Non-Modifiable Risk Factor**: e.g. age, gender, race and/or heredity
    B. **Modifiable Risk Factor**: e.g. stress, diet, exercise, sedentary lifestyle, cigarette smoking, alcohol, hypertension, contraceptive pills, hyperlipidemia, obesity, and/or DM.

• **Past history**
  - Ask the patient about a history of chest pain, shortness of breath, fatigue, alcohol and tobacco use, anemia, syncope, hypertension, rheumatic fever, streptococcal throat infections, palpitations, and edema.
  - Ask about any previous diagnoses of congenital heart disease, arrhythmias, unstable angina, MI, coronary artery bypass graft, angiography, or any other cardiac surgery.

• **Medications**
  - Assess the patient’s current and past use of medications.

**B) Physical Examination:**

**Vital Signs**
- Assess the pulse rate, rhythm, and quality of the arterial blood vessel.
  - Normal range is 60-100 beats per minute
    - **Tachycardia** is abnormal increase in HR greater than 100 b/m.
    - **Bradycardia** is abnormal decrease in HR less than 60 b/m.
  - Measure BP bilaterally.
    - An increase in BP above the upper normal range is called hypertension.
    - A decrease below the lower range is called hypotension.
  - Take BP and HR while the patient is supine, sitting with legs dangling, and standing (Decrease or unchanged systolic BP up to 10 mm Hg from the supine to the standing position - HR increase 5 to 20 beats/minute from the supine to the standing position).
  - Assess pulse pressure (It is the difference between the systolic and the diastolic pressures = 30 to 40 mm Hg). It is a reflection of stroke volume, ejection velocity, and systemic vascular resistance.
The pulse pressure increases in conditions that elevate the stroke volume (anxiety, exercise), reduce vascular resistance (fever), or reduce distensibility of the arteries (atherosclerosis, aging, and hypertension).

Pulse pressure decreases in conditions reflecting reduced stroke volume and ejection velocity (shock, HF, hypovolemia, mitral regurgitation) or obstruction to blood flow during systole (mitral or aortic).

□ Inspection.
- Inspect the skin for ulcerations or sores that don’t heal, pallor, coolness that suggests arterial or venous insufficiency.
- Inspect skin color.
  ❖ Pallor: a decrease in the color of the skin—is caused by lack of oxyhemoglobin as a result of anemia or decreased arterial perfusion.
  ❖ Peripheral cyanosis: a bluish discoloration of the nails and skin of the nose, lips, earlobes, and extremities suggesting decreased flow rate of blood to a particular area. This may occur normally in peripheral vasoconstriction associated with a cold environment, in patients with anxiety, or in disease states such as HF.
  ❖ Central cyanosis: a bluish tinge observed in the tongue and buccal mucosa denoting serious cardiac disorders (pulmonary edema and congenital heart disease).
  ❖ Ecchymosis (bruise): a purplish-blue color fading to green, yellow, or brown over time—is associated with blood outside of the blood vessels and is usually caused by trauma or prolonged clotting times.
- Inspect the extremities for conditions such as edema, clubbing of the nail beds and varicosities.
  ❖ Edema in the extremities can be caused by gravity, interruption of venous return, or right sided heart failure.
- Inspect the jugular veins in the neck for distention; while the patient’s head of bed is elevated 30-45 degrees. Normally the veins are not apparent if the head of the bed is elevated.
  ❖ Jugular venous distention indicates an abnormal increase in the volume of the venous system as associated with right-sided heart failure.
**Patient’s Assessment**

- **Palpation.**
  - Palpate the upper and lower extremities for temperature, moisture, pulses, and edema bilaterally to assess for symmetry.
  - Assess edema by depressing the skin over the tibia or medial malleolus for 5 seconds.
  - Palpate the pulses in the neck and extremities for information on arterial blood flow. It is important to palpate each carotid pulse separately.
  - Compare the characteristics of the arteries on the right and left extremities to determine symmetry.
  - Assess capillary refill to assess arterial flow to the extremities. Nail color should return after pressure in less than 2-3 seconds with normal peripheral perfusion.
  - Palpate patient's chest over the fifth left intercostals space (ICS) close to the sternum and in the left midclavicular line.
    - A valvular disorder may be suspected if abnormal pulsations or thrills (vibration) are felt.

- **Auscultation**
  - Auscultate the carotid arteries, abdominal aorta, and femoral artery using the bell of the stethoscope.
    - Narrowing, or occlusion of the carotid artery produce turbulent blood flow and can create a buzzing or humming termed a **bruit**, which should alert to the increased risk of stroke.
  - Auscultate apical pulse while palpating radial pulse. Any discrepancy between apical pulse and pulses felt is noted.
    - Pulse deficit is a difference between the apical rate and the peripheral rate.
      - Pulse deficits commonly occur with atrial fibrillation, atrial flutter, premature ventricular contractions, and varying degrees of heart block.
  - Listen to the auscultatory areas in sequence (pulmonary, aortic, tricuspid and mitral) using the stethoscope.

**Normal heart sounds** are produced by the movement of blood through the cardiac valves. These sound scan be heard through a stethoscope placed on the chest wall.
Heart sounds:

- **The first heart sound (S1)** is associated with closure of the tricuspid and mitral valves (It has a soft lubb sound). It signals the beginning of systole (heard louder at the apex).

- **The second heart sound (S2)** is associated with closure of the aortic and pulmonary valves (It has a sharp dupp sound). It signals the beginning of diastole (heard louder at the base).

Normally no sound is heard between S1 and S2 during the periods of systole and diastole. Sounds that are heard during these periods may represent abnormalities and should be described.

Auscultatory areas:

**For second heart sound:**

- The aortic area in the second ICS to the right of the sternum.
- The pulmonary area in the second ICS to the left of the sternum.

**For first heart sound:**

- The tricuspid area in the fifth left ICS close to the sternum.
- The mitral area in the left midclavicular line at the fifth ICS.

- **The S3 heart sound** (ventricular gallop) is a vibration, heard immediately after S2, occurs as a result to resistance to rapid ventricular filling during diastole. The heart sounds come in triplets and resemble the sound of a galloping horse. It may be normal in young adults.
  - S3 is pathologic in patients with left-sided heart failure or mitral valve regurgitation.
The S4 heart sound (atrial gallop) is a vibration heard immediately preceding the S1. The S4 occurs during atrial contraction. It may be normal in older adults with no evidence of heart disease.

- S4 is pathologic in patients with coronary artery disease, cardiomyopathy, hypertension, left ventricular hypertrophy, or aortic stenosis.

- Murmurs are sounds produced by turbulent blood flow across diseased heart valves (Incompetent or stenotic).

- Pericardial friction rubs are scratchy, harsh, grating sounds caused by friction that occurs when inflamed surfaces of the pericardium (pericarditis) move against each other. They may be transient or intermittent. Friction rubs are usually heard best at the apex.

Diagnostic Studies of Cardiovascular System

- **Blood Studies**
  - **Coagulation Screening Test**
    - **Bleeding Time**: 2-9 minutes.
    - **INR (The international normalized ratio)**: Normal INR in healthy people is 1.1 or below. An INR range of 2.0 to 3.0 is generally an effective therapeutic range for people taking warfarin for disorders such as atrial fibrillation or a blood clot in the leg or lung.
    - **Partial Thromboplastin Time (PTT)** – is used to identify deficiencies of coagulation factors, prothrombin fibrinogen and to monitors heparin therapy. Normal value= 25-35 sec.
    - **Prothrombin Time (PT)** – determines activity and interaction of the Prothrombin group; factors V, VII, prothrombin and fibrinogen; used to determine dosages of oral anti-coagulant. Normal value = 12-14 sec.
Patient's Assessment

- **Troponin (cardiac):**
  Protein that are released after MI.
  - Negative: <0.5 ng/mL
  - Indeterminate or suspicious for injury to myocardium: 0.5-2.3 ng/mL
  - Positive for myocardial injury: >2.3 ng/mL

- **CK-MB:**
  Cardio-specific enzyme that is released in the presence of myocardial tissue injury.
  - Elevates in MI within 4-6 hours, peaks in 18 hours and then declines till 3 days.
  - Normal value is 5 to 25 IU/L.

- **Serum Lipids**
  - **Cholesterol:** <200 mg/dL  - **Triglycerides:** <150 mg/dL
  - **High density lipoprotein (HDL):**
    - Male: >40 mg/dL
    - Female: >50 mg/dL
    - Low risk for CAD: ≥60 mg/dL
    - High risk for CAD: <40 mg/dL
  - **Low density lipoprotein (LDL):** <100 mg/dL
    - Moderate risk for CAD: 130-159 mg/dL (3.37-4.

Triglyceride and lipoprotein levels must be obtained in a fasting state (at least 12 hr, except for water). Alcohol should be withheld for 24 hr before testing.

- **Chest X-Ray**
- **12-Lead ECG**
- **Holter monitoring:** Recording of ECG rhythm for 24-48 hr and then correlating rhythm changes with symptoms and activities recorded in diary.
- **Exercise or Stress Testing:** used to evaluate the effect of exercise tolerance on cardiovascular function.
- **Echocardiogram**
- **Dobutamine echo**
- **Transesophageal echocardiogram (TEE)**
- **Magnetic resonance angiography (MRA)**
- **Cardiac computed tomography (CT)**
- **Cardiac catheterization/coronary angiography.**
## Objectives

- Obtain complete gastrointestinal system health history.
- Perform gastrointestinal system assessment.
- Define the terms related to gastrointestinal problems.
- Mention the diagnostic studies used for gastrointestinal system assessment.
- Mention the causes of false positive and false negative occult blood in stool.

## Assessment of gastrointestinal System

### (A) Complete health history

#### Present Health History.

- Gather information from the patient about the history of the following problems related to GI functioning: Nausea and vomiting, abdominal pain, anorexia, abdominal distention, indigestion, dyspepsia, trouble swallowing, heartburn, jaundice and change in bowel habit

- **Diarrhea:** an abnormal increase in the frequency and liquidity of the stool.
  - Diarrhea is sometimes associated with abdominal pain or cramping and nausea or vomiting.

- **Constipation:** a decrease in the frequency of stool, or stools that is hard and dry.
  - Constipation may be associated with anal discomfort and rectal bleeding.

- **Belching:** the expulsion of gas from the stomach through the mouth.

- **Flatulence:** the expulsion of gas from the rectum.

- Hemorrhoids or rectal bleeding

- **Hematemesis:** Vomiting with blood, fresh or coffee-ground if retained.
- **Melena**: Stool with blood - a tarry-black color in case of upper GIT bleeding.

- If there is pain, ask about its duration, pattern, frequency, location, distribution of referred pain, time of the pain and other factors, such as meals, rest and defecation that may directly affect this pain.
- **Past Health History.**
  - Ask the patient about a history or existence of diseases such as reflux, gastritis, hepatitis, colitis, gallstones, peptic ulcer, cancer, diverticuli, or hernias.
  - Question the patient about unexplained weight loss or gain within the past 6 to 12 months.

- **Medications.**
  - Ask about patient's past and current use of medications.
  - Ask about over-the-counter medications, prescription drugs, herbal products, vitamins, and nutritional supplements.
  Many drugs are potentially hepatotoxic and result in significant patient harm e.g. chronic high doses of nonsteroidal anti-inflammatory drugs (NSAIDs).
  NSAIDs (including aspirin) may also predispose a patient to upper GI bleeding.

- **Surgery or Other Treatments.**
  - Obtain information about hospitalizations for any problems related to the GI system.
  - Obtain data related to any abdominal or rectal surgery.

- **Nutritional history**
  - Take a diet history and inquire about food preferences.
  - Ask the patient for 24-hour dietary recall.
  - Ask the patient about the use of caffeine.
  - Document the amount and type of fluid and fiber intake.
  - Note any changes in appetite, and weight.
  - **Anorexia and weight loss may indicate cancer or inflammation.**
  - Ask about food allergies or food intolerances, including lactose and gluten.

- **Elimination Pattern**
  - Ask about patient's bowel elimination pattern (ask about the frequency and time of day).
  - Document the use of laxatives and enemas.
  - Investigate any recent change in bowel patterns, because inadequate intake of fiber can be associated with constipation.
  - Ask about stool characteristics (color, odor and consistency).
  - Ask about intake of foods or medications that alter stool color.

- **Family History**
- Identify any history in the family of liver or gallbladder disease, hepatitis, inflammatory bowel disease, and cancer of the colon.

(B) Physical Examination
The patient lies supine with knees flexed slightly for inspection, auscultation, palpation, and percussion of the abdomen.

☐ Inspection
- Observe the mouth for abnormalities or lesions such as pallor, cracking, ulcers, or fissures.
- Inspect the buccal mucosa for color, and lesions.
- Look for any dental caries or loose teeth.
- Note patient's ability to swallow, the tongue condition, and presence of any lesions.
- Look for swelling, bleeding, discoloration, or inflammation of the gingiva.
- Note any distinctive breath odor.
- Observe the tonsils, uvula and soft palate using tongue depressor.
- Assess the abdomen for skin changes (color, scars, striae, dilated veins, rashes, and lesions), symmetry, contour (flat, rounded, distention), observable masses or hernias, localized bulging and movement (pulsations and peristalsis).
  * Normal aortic pulsation may be seen in the epigastric area.
- Inspect perianal and anal areas for color, masses, rashes, scars, erythema, fissures, and external hemorrhoids.

☐ Auscultation:
Auscultation should be performed before percussion and palpation (which can increase intestinal motility and thereby change bowel sounds).
- Divide the abdomen into four quadrants by a perpendicular line from the sternum to the pubic bone and a horizontal line across the abdomen at the umbilicus.
- Listen to the bowel sounds for at least 2 minutes in each quadrant using the diaphragm of the stethoscope. (Normal sounds are relatively high pitched and gurgling. Loud gurgles indicate hyperperistalsis).
- Document the frequency of the sounds as follows:
  - **Normal** (sounds heard about every 5 to 20 seconds).
  - **Hypoactive** (one or two sounds in 2 minutes).
  - **Hyperactive** (5 to 6 sounds heard in less than 30 seconds).
  - **Absent** (no sounds in 3 to 5 minutes).

- Listen for vascular sounds with the bell of the stethoscope.
  - **Bruit**: a swishing or buzzing sound that indicates turbulent blood flow.

**Percussion**

The purpose of percussion of the abdomen is to estimate the size of the liver and determine the presence of fluid, distention, and masses.

- Lightly percuss all four quadrants of the abdomen. Sounds vary according to the density of underlying tissues.
  - Air produces a higher-pitched, hollow sound termed **tympany**.
  - Fluid or masses produce a short, high-pitched sound with little resonance termed **dullness**.
- Determine the borders of the liver.

**Palpation**

- Use smooth circular movements and palpate all quadrants lightly then deeply.
  - **Light palpation** is used to detect tenderness, muscular resistance, masses, and swelling.
  - **Deep palpation** is used to delineate abdominal organs (liver, spleen) and masses. Note the location, size, and shape of masses, as well as the presence of tenderness.
    - **Liver enlargement** (Hepatomegaly) can be detected by palpation and can be caused by cirrhosis, hepatitis, right heart failure, cysts, and malignancy.
    - **Murphy's sign** is positive in cholecystitis (pain is present on deep inspiration when an inflamed gallbladder is palpated by pressing the fingers under the rib cage).
- Observe the patient’s facial expression during these maneuvers, because it will provide nonverbal cues of discomfort or pain.
- Check area of discomfort for rebound tenderness by pressing in slowly and firmly over the painful site. Then release fingers quickly.
  - **Pain of rebound tenderness indicates peritoneal inflammation**.

Because assessing for rebound tenderness may produce pain and severe muscle spasm, it should be done at the end of the examination and only by an experienced practitioner.
- Insert a gloved, lubricated index finger into the rectum as far as possible, and palpate all surfaces. Assess any nodules, fistula opening, hemorrhoids, tenderness, or irregularities.

**Diagnostic Studies Of Gastrointestinal System**

- **Stool analysis**: for fecal urobilinogen, fat, parasites, food residues, and other substances.
- **Occult blood in stool**: is one of the most commonly performed stool tests. It tests only for the presence of blood.
  - **False-positive results** may occur if the patient has eaten meat, liver, poultry, turnips, melons, salmon, broccoli, cauliflower or sardines within 7 days before testing.
  - Medications that can cause gastric irritation, such as aspirin, ibuprofen, corticosteroids, chemotherapeutic agents, and anticoagulants, may also cause false-positive results.
- **False-negative results** can be caused by ingestion of vitamin C from supplements or foods.
- **Blood test:**
  - Hepatitis markers: to detect Hepatitis A, B, and C.
  - Liver function test: ALT, AST
  - Bilirubin- evaluates liver function, biliary obstruction, and hemolytic anemia.
  - Albumin - influenced by nutritional state, and hepatic and renal function.
  - Serum amylase - useful to diagnose pancreatitis.
  - Serum lipase - assists in diagnosis of pancreatitis, but it is not specific and also may be elevated in biliary and hepatic disease, DM, and gastric malignancy.
- **Abdominal ultrasonography**
- **Endoscopic ultrasonography** (EUS) is a specialized enteroscopic procedure that aids in the diagnosis of gastrointestinal disorders by providing direct imaging of a target area.
- **X-ray with barium swallow**
- **Computed tomography (CT) scans**
- **Magnetic resonance imaging (MRI)**
- **Radionuclide imaging**
- **The upper endoscopy and lower gastrointestinal colonoscopy**
- **Capsule endoscopy**
Chapter 9
Assessment of Urinary System

Objectives

- Obtain complete urinary system health history.
- Perform urinary system assessment.
- Define the terms related to urinary system problems.
- Mention the diagnostic studies used for urinary system assessment.

Assessment of the Urinary System

(A) Health history:

- **Present Health History**
  - Ask the patient about any of the following symptoms: Painful urination, changes in color of urine (blood, cloudy), change in characteristics of urination (diminished, excessive), problems with frequent nighttime urination (nocturia), urgency, incontinence, and/or urinary retention.
  - **Anuria** means no urination or urine output <100 ml in 24-hr. It occurs in acute kidney injury, end-stage kidney disease and bilateral ureteral obstruction.
  - **Dysuria** means painful or difficult urination. It is a sign of urinary tract infection and cystitis.
  - **Enuresis** means involuntary nocturnal urination. It is a symptom of lower urinary tract disorder.
  - **Frequency** means increased incidence of urination. It is a sign of acutely inflamed bladder, excess fluid intake, and intake of bladder irritants.
  - **Urgency** is a sudden, compelling urge to urinate. It may occur with irritation and/or inflammation of the bladder wall and in cystitis.
  - **Hematuria** means blood in the urine. It is a sign of cancer of genitourinary tract, blood incompatibility, urinary tract infection, stones in kidney or ureter and occurs with medications (anticoagulants) intake.
- **Hesitancy** means delay or difficulty in initiating urination. It occurs with partial urethral obstruction and benign prostatic hyperplasia.

- **Incontinence** means inability to voluntarily control discharge of urine. It is a sign of neurogenic bladder, bladder infection, and injury to external sphincter.

- **Nocturia** means frequency of urination at night. It is a sign of heart failure, diabetes mellitus, finding after renal transplant, excessive evening and nighttime fluid intake.

- **Oliguria** means diminished amount of urine in a given time (24-hr urine output of 100-400 ml). It is a sign of severe dehydration, shock, transfusion reaction, and end-stage kidney disease.

- **Suprapubic pain** (related to bladder), **urethral pain** (irritation of bladder neck), **flank pain**, are signs of urinary tract infection, urinary retention, foreign body in urinary tract, urethritis, pyelonephritis, renal colic or stones.

- **Polyuria** is voiding a large volume of urine in a given time. It is a sign of diabetes mellitus, diabetes insipidus, chronic kidney disease, diuretics, and excess fluid intake.

- **Retention** is the inability to urinate even though bladder contains excessive amount of urine. It may occurs after pelvic surgery, childbirth, catheter removal and anesthesia; urethral stricture or obstruction and neurogenic bladder.

- **Stress incontinence** is an involuntary urination with increased pressure (sneezing or coughing). It is a sign of weakness of sphincter control, lack of estrogen and urinary retention.

- **Past Health History**
  - Ask the patient about history of diseases that are related to renal or other urologic problems e.g. hypertension, diabetes mellitus, gout and congenital disorders, neurologic conditions (e.g., stroke, back injury) or trauma.
  - Note specific urinary problems such as cancer, infections, benign prostatic hyperplasia, and calculi.

- **Medication**
  - Ask about medications intake including over-the-counter drugs, prescription medications, and herbs, as, many drugs are known to be nephrotoxic and certain drugs may alter the quantity and character of urine output (e.g., diuretics).
- Ask about drugs that change the color of urine e.g. Macrodantin.
- Ask about intake of anticoagulants that may cause hematuria.
- Ask about medications that may affect the ability of the bladder or sphincter to contract or relax normally e.g. antidepressants, calcium channel blockers, antihistamines, and drugs used for neurologic and musculoskeletal disorders.

**Surgery or Other Treatments**
- Ask the patient about previous hospitalizations related to renal or previous urologic diseases.
- Inquire about the duration, severity of any problem and its treatment.
- Document past surgeries, particularly pelvic surgeries, or urinary tract instrumentation (e.g., catheterization).
- Ask the patient about any radiation or chemotherapy treatment.

**Occupational and social history**
- Take an occupational history because exposure to certain chemicals may be nephrotoxic. Textile workers, painters, hairdressers, and industrial workers have a high incidence of bladder tumors.
- Get a smoking history as cigarette smoking is a major risk factor for bladder cancer.

**Nutritional Pattern Assessment**
- Ask about the quantity and types of fluid a patient drinks.
  - Dehydration may contribute to urinary tract infection, calculi formation, and kidney failure.
  - Large intake of particular foods, such as dairy products or foods high in proteins, may also lead to calculi formation.
  - Caffeine, alcohol, carbonated beverages, some artificial sweeteners, or spicy foods often aggravate urinary inflammatory diseases.
  - Green tea and some herbal teas also cause diuresis.

**Elimination pattern assessment**
- Investigate bowel function. Problems with fecal incontinence may signal neurologic causes for bladder problems because of shared nerve pathways.
- Ask about presence of constipation and fecal impaction, as they can partially obstruct the urethra, causing inadequate bladder emptying, and infection.

(B) **Physical Examination:**
**Inspection**
- Assess for changes in the following:
  - **Skin**: Pallor, changes in turgor, bruises and/or texture.
  - **Mouth**: Stomatitis, ammonia breath odor.
  - **Face and extremities**: Generalized edema or peripheral edema.
  - **Abdomen**: Striae, abdominal contour.
    - *Midline mass in lower abdomen may indicate urinary retention.*
    - *Unilateral mass is indicating enlargement of one or both kidneys from large tumor or polycystic kidney.*
  - **Weight**: Weight gain secondary to edema; weight loss and muscle wasting in kidney failure
  - **General state of health**: Fatigue, lethargy, and diminished alertness.

**Palpation.**
- To palpate the right kidney; place your left hand behind and support the patient's right side between the rib cage and the iliac crest. Elevate the right flank with the left hand.
- Use your right hand to palpate deeply for the right kidney. The lower pole of the right kidney may be felt as a smooth, rounded mass that descends on inspiration. If the kidney is palpable, note its size, and tenderness.
  - *Kidney enlargement is suggestive of neoplasm or other serious renal pathologic conditions.*
- The urinary bladder is normally not palpable unless it is distended with urine. If the bladder is full, it may be felt as a smooth, round, firm organ and is sensitive to palpation.

**Percussion.**
- Tenderness in the flank area may be detected by fist percussion. Normally a firm blow in the flank area should not elicit pain.
  - If tenderness and pain are present, it may indicate a kidney infection or polycystic kidney disease.
- A bladder is not normally percussible until it contains 150 ml of urine. If the bladder is full, dullness is heard above the symphysis pubis and may be percussed as high as the umbilicus.

**Auscultation**
- The bell of the stethoscope may be used to auscultate the abdominal aorta and renal arteries for a *bruit*, which indicates impaired blood flow to the kidneys.
- Use the diaphragm of the stethoscope to auscultate the bowels, since they may also affect the urinary system.

**DIAGNOSTIC STUDIES OF THE URINARY SYSTEM**

- **Urine Studies**
  - **Urinalysis:** Measures specific components, such as electrolytes, glucose, protein, ketons, creatinine, minerals and specific gravity.  
  - *Normal specific gravity: 1.003-1.030.*
  - Try to obtain first urinated morning specimen.
  - Ensure specimen is examined within 1 hr of urinating.
  - **Creatinine clearance:** Needs collecting 24-hr urine specimen. Discard first urination when test is started. Save urine from all subsequent urinations for 24 hr. Instruct patient to urinate at end of 24 hr and add specimen to collection.
  - **Urine culture:** It confirms suspected urinary tract infection and identifies causative organisms. Use sterile container for collection of urine. Touch only outside of container. Cleanse urethra before voiding.

- **Blood Studies**
  - **Blood urea nitrogen (BUN):** *Normal value: 6-20 mg/dl.*
  - When interpreting BUN, be aware that non-renal factors may cause increase (e.g., rapid cell destruction from infections, fever, GI bleeding, trauma, athletic activity and excessive muscle breakdown, corticosteroid therapy).
  - **Creatinine:** *Normal value: 0.6-1.3 mg/dl.*
  - **BUN/creatinine ratio:**
    - An increased ratio may be due to conditions that decrease blood flow to kidneys (e.g., heart failure, dehydration), GI bleeding, or increased dietary protein.
    - A decreased ratio may occur with liver disease (due to decreased urea formation) and malnutrition.  
    - *Normal value: 12:1 to 20:1.*
  - **Potassium:** *Normal value: 3.5-5.0 mEq/L.*
  - **Calcium (total)** *Normal value: 8.6-10.2 mg/dl.*
Kidneys, ureters, bladder (KUB): X-ray examination of abdomen and pelvis delineates size, shape, and position of kidneys. Radiopaque stones and foreign bodies can be seen.

Intravenous pyelogram (IVP): Visualizes urinary tract after IV injection of contrast media to evaluate presence, position, size, and shape of kidneys, ureters, and bladder. Cysts, tumors, lesions, and obstructions cause a distortion in normal appearance of these structures.

Renal arteriogram (angiogram) visualizes renal blood vessels. Can assist in diagnosing renal artery stenosis……etc.

Renal ultrasound

Computed tomography (CT) scan: Provides excellent visualization of kidneys’ size, tumors, abscesses, suprarenal masses (e.g., adrenal tumors, pheochromocytomas), and obstructions can be detected.

Magnetic resonance imaging (MRI)

Magnetic resonance angiography

Cystoscopy: Inspects interior of bladder with a tubular lighted scope.

Renal Scan: Evaluates anatomic structures, perfusion, and function of kidneys. Radioactive isotopes are injected IV.

Renal Biopsy Obtains renal tissue for examination to determine type of kidney disease or to follow progress of kidney disease.
Chapter 10
Assessment of Musculoskeletal System

Objectives

- Obtain complete musculoskeletal system health history.
- Perform musculoskeletal system assessment.
- Define the terms related to musculoskeletal system problems.
- Mention the diagnostic studies used for musculoskeletal system assessment.

Assessment of Musculoskeletal System

(A) Health history:

- **Present Health History**
  - Ask the patient about any symptoms indicating musculoskeletal impairment include pain, weakness, deformity, limitation of movement, stiffness, and joint crepitation.

  - **Ankylosis** is stiffness and fixation of a joint. It is a sign of chronic joint inflammation and destruction (e.g., rheumatoid arthritis).

  - **Contracture** is a resistance of movement of muscle or joint as a result of fibrosis of supporting soft tissues. It is a sign of shortening of muscle or incorrect positioning of immobilized extremity.

  - **Crepitation (crepitus)** is a frequent, audible crackling sound with palpable grating that accompanies movement. It is a sign of fracture or dislocation.

  - **Dislocation** is a separation of two bones from their normal position within a joint.
● **Muscle spasticity** is increased muscle tone (rigidity) with sustained muscle contractions (spasms); stiffness or tightness may interfere with gait, movement, speech. It is a sign of neuromuscular disorders such as multiple sclerosis (MS) or cerebral palsy.

● **Myalgia** is a general muscle tenderness and pain as a result of chronic rheumatic syndromes, overuse, injury, or strain.

● **Subluxation** is partial dislocation of joint as a result of instability of joint capsule and supporting ligaments due to trauma.

- Ask the patient about changes in sensation or in the size of a muscle.

● **Paresthesia** is numbness and tingling, often described as a “pins sensation as a result of compromised sensory nerves, often due to edema in a closed space such as a cast or bulky dressing. May also result from spinal stenosis.

● **Atrophy** is a flabby appearance of muscle leading to decreased function and tone. It is a sign of muscle denervation, contracture, and prolonged disuse as a result of immobilization.

**Past Health History.**
- Question the patient about past illnesses that are known to affect the musculoskeletal system either directly or indirectly, e.g. tuberculosis, poliomyelitis, diabetes mellitus, parathyroid problems, rickets, and neuromuscular disabilities.
- Ask about past musculoskeletal problems that can affect the patient’s overall health e.g. trauma.
- Questions about symptoms of arthritic and connective tissue diseases (e.g., gout, psoriatic arthritis, systemic lupus erythematosus) and osteomalacia.

**Medications.**
- Question the patient regarding prescription and over-the-counter drugs and herbal products.
- Obtain detailed information about each treatment.
- Inquire about the use of skeletal muscle relaxants, opioids, nonsteroidal antiinflammatory drugs, and systemic and topical corticosteroids.
- Ask the patient about drugs that can have side effects on musculoskeletal system e.g. anti-seizure drugs (osteomalacia), phenothiazines (gait disturbances), corticosteroids (decreased bone and muscle mass), and potassium-depleting diuretics (muscle cramps and weakness).
- Question women amenorrhea can contribute to the development of osteoporosis.
- Ask postmenopausal women about their use of hormone therapy.
- Inquire about calcium and vitamin D supplements.

- **Surgery or Other Treatments.**
  - Obtain information about past hospitalizations related to a musculoskeletal problem.
  - Document details of emergency treatment for musculoskeletal injuries.

- **Lifestyle Pattern.**
  - Ask about the patient’s health practices related to the musculoskeletal system, such as maintenance of a normal body weight, avoidance of excessive stress on muscles and joints, and use of proper body mechanics when lifting objects.
  - Question the patient specifically about tetanus and polio immunizations.
  - Ask the patient about safety practices as they relate to the work environment, home life, recreation, and exercise.

- **Family history**
  - Obtain a family history related to rheumatoid arthritis, systemic lupus erythematosus, osteoarthritis, gout, osteoporosis, and scoliosis.

- **Nutritional Assessment**
  - Assess intake of vitamins C and D, calcium, and protein.
  - Ask about abnormal nutritional patterns that can predispose individuals to problems such as osteoporosis.
  - Assess body weight, as obesity places additional stress on weight-bearing joints such as the knees, hips, and spine.

- **Activity-Exercise Pattern.**
  - Obtain detailed information about the type, duration, and frequency of exercise and recreational activities.
  - Question the patient about limitations in movement, pain, weakness, crepitus, or any change in the bones or joints that interferes with daily activities.
(B) Physical Examination:

- **Inspection.**
  - A systematic inspection starting at the head and neck and proceeding to the upper extremities, lower extremities, and trunk.
  - Note the patient’s general body build and symmetry of joints.
  - Observe for any swelling, deformity, nodules or masses, and discrepancies in limb length or muscle size.
  - Normally, there are
    - Normal spinal curvatures.
    - No muscle atrophy or asymmetry.
    - No joint swelling, deformity, or crepitation.
    - No tenderness on palpation of spine, joints, or muscles.
    - Full range of motion of all joints without pain.

- **Palpation.**
  - Palpate area of complaint or that appears abnormal on inspection.
  - Palpate both muscles and joints to evaluate skin temperature, local tenderness, swelling, and crepitus.

- **Motion.**
  - Assess patient’s joint mobility, and carefully evaluate both active and passive range of motion.
  - Ask the patient if activities such as eating and bathing need to be performed with assistance or cannot be done at all.

- **Muscle-Strength Testing.**
  - Grade the muscles’ strength during contraction bilaterally, with full resistance to opposition.
    - Have the patient apply resistance to the force the examiner is exerting.

**Diagnostic Studies of Musculoskeletal System**

- **Standard x-ray**
- **Diskogram:** X-ray of cervical or lumbar inter-vertebral disc after injecting contrast media. It permits visualization of inter-vertebral disc abnormalities.
- **Computed tomography (CT) scan**
- **Myelogram with or without CT**: Involves injecting a radiographic contrast medium into sac around nerve roots. CT scan may follow.
- **Magnetic resonance imaging (MRI)**
- **Bone scan**
- **Arthroscopy**
- **Arthrocentesis**: Incision or puncture of joint capsule to obtain samples of synovial fluid from within joint cavity or to remove excess fluid.
- **Electromyogram (EMG)**: Evaluates electrical potential associated with skeletal muscle contraction.
- **Rheumatoid factor (RF)**: Assesses presence of autoantibody in serum. It is not specific for rheumatoid arthritis.

*Reference interval*: Negative or titer <1:17

- **Uric acid**: Although not specific, levels are usually elevated in gout.
  
  *Male*: 4.4-7.6 mg/dL
  
  *Female*: 2.3-6.6 mg/dL

- **C-reactive protein (CRP)**: Used to diagnose inflammatory diseases, infections, and active widespread malignancy. Synthesized by the liver and is present in large amounts in serum 18-24 hr after onset of tissue damage.

*Reference interval*: 6.8-820 mcg/dL (68-8200 mcg/L).
Chapter 11
Assessment of Breast and Lymphatic System

Objectives

- Obtain complete health history related to the breast and lymphatic system.
- Perform complete breast and lymphatic system assessment.
- Differentiate between benign and cancerous tumors.

Assessment of the Breast and Axillary System

(A) Obtaining Health history

- **History of present illness:**
  - Ask the patient the following questions:
  - Have you noticed any lumps or swelling in your breasts?
  - If so, where? When did you first notice it?
  - Has the lump grown or swelling increased?
  - Is the lump or swelling associated with other problems?
    - **Lumps may be present with benign breast disease (fibrocystic breast disease), fibroadenomas, or malignant tumors.**
  - Does the lump or swelling change during your menstrual cycle?
    - **Premenstrual breast lumpiness and soreness that subside after the end of the menstrual cycle may indicate benign breast disease.**
  - Have you noticed any lumps or swelling in the underarm area?
  - Have you noticed any redness, warmth, dimpling of your breasts any rash on the breast, nipple, or axillary area?
    - **Redness and warmth indicate inflammation. A dimpling or retraction of the nipple or fibrous tissue may indicate breast cancer.**
  - Have you noticed any change in the size or firmness of your breasts?
- Do you experience any pain in your breasts? If so, where?
- Does it occur at any specific time during your menstrual cycle?
- Is there a certain activity that seems to initiate the pain?
  - Pain and tenderness of the breasts are common in benign breast disease and just before and during menstruation, especially for clients taking oral contraceptives.
  - Breast pain can also be a late sign of breast cancer.
- Do you have any discharge from the nipples?
- If so, describe its color, consistency, and odor, if any. When did it start? Which nipple has the discharge?
  - History of past illness:
    - Have you had any prior breast disease?
      - A personal history of breast cancer increases the risk for recurrence of cancer.
    - Have you ever had breast surgery, a breast biopsy, breast implants, or breast trauma? If so, when did this occur?
    - How old were you when you began to menstruate? Have you experienced menopause?
      - Early menses (before age 13) or delayed menopause (after age 52) increases the risk for breast cancer.
    - Have you given birth to any children? At what age did you have your first child?
    - When was the first and last day of your menstrual cycle?
      - Hormone-related swelling, breast tenderness, and generalized lumpiness are reduced right after menstruation.
  - Family health history
    - Is there a history of breast cancer in your family? Who (sister, mother, maternal grandmother)?
  - Lifestyle and health practices
    - Are you taking any hormones, contraceptives, or antipsychotic agents?
      - Hormones and some antipsychotic agents can cause breast engorgement in women.
      - Hormones and oral contraceptives also increase the risk of breast cancer.
      - An antipsychotic drug, can cause galactorrhea (persistent milk secretion whether or not the woman is breast-feeding or not).
    - Do you live or work in an area where you have excessive exposure to radiation, benzene, or asbestos?
Exposure to these environmental hazards can increase the risk of breast cancer.
- What is your typical daily diet?
  - A high-fat diet may increase the risk for breast cancer.
- Do you drink alcohol?
  - Alcohol intake exceeding two drinks per day has been associated with a higher risk for breast cancer.
- How much coffee, tea, and cola do you consume each day?
  - Caffeine can aggravate fibrocystic breast disease.
- Do you engage in any type of regular exercise? If so, what type of bra do you wear when you exercise?
- Do you examine your own breasts? Describe when you do this. Have you noted any changes in your breasts such as a lump, swelling, skin irritation, or dimpling, nipple pain or retraction (turning inward), redness or scaliness or nipple or breast skin, or discharge?

(B) Physical examination:
- Inspection
  - Inspect size and symmetry, while having the client disrobe and sit with arms hanging freely.
  - Inspect the breast and axillary skin for rashes or infection and texture. Note any lesions.
  - Inspect superficial venous pattern. Observe visibility and pattern of breast veins.
    - A prominent venous pattern may occur as a result of increased circulation due to a malignancy.
    - An asymmetric venous pattern may be due to malignancy.
  - Inspect the areolas. Note the color, size, shape, and texture of the areolas of both breasts.
    - Orange-peel (peau d'orange) appearance is associated with carcinoma.
  - Inspect the nipples for any retraction and dimpling, dryness, lesions, bleeding, or discharge.
    - Retracted nipples that was previously everted and dimpling or retraction is usually caused by a malignant tumor.

- Palpation
  - Palpate the breast for texture and elasticity.
    - Thickening of the tissues may occur with an underlying malignant tumor.
- Palpate the breast for tenderness and temperature.
  - Painful breasts may be indicative of benign breast disease but can also occur with a malignant tumor.
  - Heat in the breasts indicates inflammation.

- Palpate breasts and axillary lymph nodes for swelling, lump and masses (Note location, size, shape, mobility, consistency, and tenderness). Use the flat pads of three fingers to palpate the client’s breasts using one of three different patterns.

- Malignant tumors are usually unilateral with irregular, poorly delineated borders, hard and non tender and fixed to underlying tissues.

- Benign breast tumors are usually 1- to 5-cm, round or oval, mobile, firm, solid, elastic, non tender, single or multiple benign masses found in one or both breasts. Pain and fullness occurs just before menses.

- Palpate the nipples. Wear gloves to compress the nipple gently with your thumb and index finger.
  - Discharge may be seen in endocrine disorders and with certain medications (i.e., antihypertensives, tricyclic antidepressants, and estrogen).
  - Discharge from one breast may indicate benign intraductal papilloma, fibrocystic disease, or cancer of the breast.

- Palpate the axillae. Hold the client’s elbow with one hand, and use the three finger pads of the other hand to palpate firmly the axillary lymph nodes.
  - Enlarged (greater than 1 cm) lymph nodes may indicate infection of the hand or arm.
- Large nodes that are hard and fixed to the skin may indicate an underlying malignancy.

- Inspect and palpate the breasts, areolas, nipples, and axillae. Note any swelling, nodules, or ulceration. Palpate the flat disc of undeveloped breast tissue under the nipple.

- Soft, fatty enlargement of breast tissue is seen in obesity.

- **Gynecomastia** is noncancerous increase in the size of male breast tissue in which a smooth, firm, movable disc of glandular tissue, may be seen in one breast during puberty for a temporary time and may also be seen in hormonal imbalances, drug, cirrhosis, leukemia, and thyrotoxicosis.

- Irregularly shaped, hard nodules occur in breast cancer.

**Diagnostic Studies For Breast Assessment**

- Mamogram
- Breast ultrasound
- Breast biopsy
- PET scan
1. Observe for symmetry, lumps, dimpling, nipple retraction, or failure of nipple erection.

2. Gently squeeze nipple and observe for secretion, and nipple erection after each nipple is gently stimulated.

3. While leaning forward, observe breasts as they are reflected in mirror to detect irregularity, retracted areas, nipple retraction especially on one side only.

4. Feel for nodes, irregularity, and tenderness both in breasts and axillary areas.
Objectives

- Mention the contents of the Pre hospital report.
- Mention the three levels of prehospital assessment.
- Define primary and secondary survey.
- Mention how to perform primary and secondary assessment

Emergency Assessment

History taking and clinical examination form the basis of all clinical assessments. The history enables a short list of differential diagnoses to be generated. Evidence from clinical examination can be used to refine this.

(A) History taking

All clinicians use the same basic history taking template; however, flexibility is essential: be prepared to modify your approach depending on the clinical situation, the patient’s concerns or fears and their level of education and understanding.

History of the presenting complaint

This is the most conversational component of the medical history and it is relatively easy to lose focus or drift off into unrelated areas. Therefore, you need to structure the interview in a way that allows you to extract the relevant information, while remaining relaxed and polite. Never lose your temper with a so-called bad historian; good history takers can get the important points of the story from any patient.

Use the following routine:

- Correctly identify your patient, checking their name, address, date of birth and who referred them
• Start with ‘open’ questions like ‘What has happened over the last few days?’ or ‘When did you last feel well?’

• Listen during this first part of the consultation and let the patient talk.

• Form a differential diagnosis based upon the patient’s original description during the next part of the history, use ‘closed’ or direct questions to focus upon the important points and narrow your list of differential diagnoses based on associated features, speed of onset, duration, previous episodes, etc.

• The duration and speed of onset of the patient’s symptoms are particularly important, e.g. if a focal neurological defect develops over the course of a few minutes, this could be due to an acute vascular event; if it develops over a number of days there may be infection, while a defect that develops over months could suggest an underlying tumor or subdural hemorrhage.

• Avoid asking more than one question at once, e.g. ‘Have you had pain or breathlessness?’ should be, ‘Have you had any pain?’ followed by ‘Have you been breathless?’

• Throughout the interview, be careful to use language that the patient will understand and avoid medical terminology.

• Finally, ask if the patient has any worries or concerns: fear and preconceptions often color the interpretation of symptoms and are always important features of the history.

**Systemic enquiry**

A few further screening questions are sufficient to identify any areas worthy of additional focus:

• **Cardiovascular:** chest pain, palpitations, breathlessness, orthopnoea, oedema.

• **Respiratory:** breathlessness, cough, sputum, haemoptysis, chest pain

• **GI:** abdominal pain or swelling, bowel habit and bleeding, vomiting, swallowing problems

• **Genitourinary:** dysuria, frequency, urgency, haematuria

• **Neurological symptoms:** headache, weakness or altered sensation, fits falls, change vision or hearing or speech.

• **Systemic:** anorexia, weight loss, fever, night sweats, fatigue, sore or stiff joints, itch or rash.

**Past medical history**

- Enquire about the following common illnesses: asthma, COPD (bronchitis, emphysema), ischemic heart disease (angina), myocardial infarction (heart attack), cardiac failure (fluid on the lung), diabetes mellitus, previous pulmonary TB, previous surgery, previous admissions especially to the intensive care unit (ICU), stroke, epilepsy (fits), hypertension (high blood pressure), hypercholesterolaemia, venous thromboembolism (thrombosis or clots), previous rheumatic fever or significant childhood illnesses.

**Drug history**
- Accurate doses, including the timing of administration, are essential, especially for insulin regimes and warfarin.
- If the patient is on a lot of medications, ask if they have an up-to-date repeat prescription with them.
- Make specific note of drug allergies. Ask what the patient means by ‘allergy’: feeling sick or diarrhoea is often mislabelled as such.
- In patients with lung disease, check if they are prescribed inhalers and that they know how to use them. Also ask if they are on long-term oxygen therapy. Check if the patient is on long-term oral theophylline or phenytoin; if so, you will need to measure a drug level before prescribing any additional IV treatment.

**Family history**
- Enquire about conditions affecting family members, e.g. asthma, ischemic heart disease, stroke, malignancy or diabetes.

**Social history**
- Accurately document home circumstances, e.g. living alone; independent at home but has social support; residential or nursing home resident. If the patient receives support at home, quantify this in terms of visits per day and the support provided. Ask if the patient has family nearby and if they see them.
- Determine the patient’s functional capacity and whether they are able to perform the activities of daily living (ADLs), e.g. leaving the house, doing the shopping, housework or cooking. This information allows the setting of realistic discharge goals and is useful when considering treatment plan or referral to intensive care.
- Ask about quality of life (QoL).
- Document cigarette smoking and alcohol consumption in units per week:

**Psychiatric history**
- Formal psychiatric assessment should be performed in specialist units; however, psychiatric illnesses commonly present to other departments where they should be properly assessed and referred to psychiatry, as appropriate.

A detailed history is essential and must include the following:
- Educational background, religion and occupation, as these may influence interview technique and general approach.
- Reason and source of referral (self-presentation indicates insight).
- History of the presenting complaint: enquire about the patient’s symptoms in their own words,
including their effect upon normal function (e.g. work, family, relationships), date of onset, rate of progression and any precipitants identified by the patient.

- Previous treatments, including drugs, surgery and others, e.g. cognitive behavioral therapy, electro-convulsive therapy.
- Suicidal ideation.

**Personal history** should be taken in detail, including:

- Childhood problems including parental separation and any history of abuse
- Relationships and marital history
- Work history, including current level of satisfaction at work and reasons for leaving previous jobs.
- Premorbid personality, e.g. anxious, obsessive, solitary
- Cognitive assessment should be performed (cognitive dysfunction suggests organic rather than functional pathology)
- Acute (delirium) and chronic (dementia) cognitive impairment should be distinguished by discussion with family members or social contacts.

**Recording the history**

Many hospitals now provide an admission pack, which includes a history taking proforma for all new admissions.

When recording the history of the presenting complaint, include the main problem and mode of referral. This should be followed by a short paragraph that covers the relevant additional positive or negative points from the history with regard to this presenting problem, e.g. onset, duration, precipitating and relieving factors, previous similar events, as well as relevant admissions or outpatient attendances.

**B) Physical Examination**

Ask for permission to examine them and check if there is any area that is sore to touch.

Ensure that the patient is comfortable and in the correct body position for the system you aim to assess:

- **Cardiovascular and respiratory**: 45° semi-recumbent
- **Abdominal**: lying supine
- **Neurological**: semi-recumbent position in bed or sitting in chair, depending on the particular examination performed.

Begin with a general examination, then follow the principles of inspection, palpation, percussion and auscultation as you work through the relevant body systems.

Important signs to look for during your examination of each body system. Note that when
palpating, you should start with the least painful side first and work slowly towards the site of worst pain.

**Neurological examination**

A flexible approach is essential, especially in patients with receptive dysphasia or cognitive impairment.

The order of the tests performed will vary depending on the clinical situation, but should include assessment of cranial nerve function, the motor and sensory components of cerebral function, and cerebellar function.

**Inspection**

Note any abnormality of resting limb position (contracture or palsy), involuntary movements (seizure activity, tremor and chorea), muscle wasting, and gait.

**Cranial nerves**

Examine cranial nerves II–XII; Cranial nerve I (olfactory nerve) is not routinely assessed.

**Motor examination**

For motor examination, assess tone, power and reflexes, starting proximally and moving distally; compare right with left.

Give the patient clear instructions when examining power. It is important to distinguish between upper and lower motor neurone weakness, *tone*: ‘normotonia’ varies; if hypertonia is genuine, check whether symmetrical or generalized.

- **Power**: grade 0–5, compare right with left testing individual muscle groups (shoulder, elbow, wrist, fingers, hip, knee and ankle); it is often better to ask the patient to resist you moving their limb than to move it in a certain direction.

- **Reflexes**: strike the tendon, not the muscle; test biceps, triceps, supinator, knee and ankle jerks; an extensor plantar. Consider using a distraction maneuver at the time of striking the tendon.

**Sensory examination**

- Sensory examination involves an assessment of pain, light touch, proprioception and vibration sense.

  - Assess pain using pain assessment scales and light touch using a cotton ball.

  - Determine whether any abnormality is symmetrical or isolated, whether it corresponds to a particular area or is suggestive of a sensory level (spinal cord lesion).

  - Proprioception and vibration sense should be assessed at the distal joints first, moving proximally if an abnormality is detected.

**Cerebellar function**
The cerebellum has an important role in the coordination of movement:
• Perform the finger–nose test looking for ataxia.
• Test rapid alternating movements.
• Compare right with left.

Assessment of the Acutely Ill Patient

It is vital that the assessment of the acutely ill patient is carried out in a logical manner. On arriving at the scene, first check that it is safe to assess and treat the patient on site. This is particularly important in an out-of-hospital environment. Then proceed according to the ABCDE acronym (Airway, Breathing, Circulation, Disability, and Exposure).

A. Airway
Partial airway obstruction may present as stridor, gurgling or wheeze, while a silent chest may indicate complete airway obstruction.

Airway compromise is common in acutely ill patients and may be due to:
• CNS depression
• Upper airway secretions, blood or vomit
• Disruption of upper airway anatomy by trauma
• Foreign body
• Pharyngeal swelling or laryngospasm.

If the patient’s airway appears threatened or unprotected, it is imperative that airway patency be restored and maintained.

Inspect the airway; if it is not patent or likely to be compromised in the near future, proceed as outlined in ‘Basic life support.

Remember to protect the cervical spine in any patient with traumatic injuries.

B. Breathing
While keeping the airway open, look, listen and feel for evidence of spontaneous respiration.
• If the patient is not breathing, put out an arrest call and check whether a cardiac output is present.
• If the patient is breathing, assess the rate and pattern of respiration, and note the extent and symmetry of any chest wall movement; listen to the chest.

High flow oxygen (60–100%) by trauma mask should be given to all critically ill patients pending urgent arterial blood gas results; these results are particularly important in patients

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High flow oxygen (60–100%) by trauma mask should be given to all critically ill patients pending urgent arterial blood gas results; these results are particularly important in patients
with previous type 2 respiratory failure, e.g. COPD.

Proximal, upper airway secretions should be removed using a Yanker suction catheter.

**C. Circulation**

**Impalpable pulse**

If the radial pulse is absent, check a more proximal artery, e.g. femoral, carotid; if you still cannot feel a pulse, put out an arrest call and start cardiopulmonary resuscitation (CPR),

**Palpable pulse**

Immediately attach a cardiac monitor, measure the blood pressure, heart rate and rhythm. Look for evidence of poor peripheral perfusion (pallor, cool cyanosed peripheries, a prolonged capillary refill time).

Prompt treatment of shock is essential; insert at least 2 wide-bore cannulae and start a rapid IV infusion; take routine bloods, including a cross-match and cultures.

Listen to the heart, perform a 12-lead ECG, identify and treat any arrhythmia;

Check for evidence of hemorrhage; if present, this must be controlled following adequate resuscitation; if necessary, contact the relevant on-call surgical team.

**D. Disability**

Perform a rapid neurological evaluation of the patient.

Quantify the level of consciousness using the Glasgow Coma Scale (GCS).

Assess pupillary size, symmetry and responses.

Look for any lateralizing neurological signs, or evidence of a spinal cord level.

Look for any reversible causes of neurological abnormality.

Check the blood glucose.

**E. Exposure**

Expose the relevant parts of the body and examine the patient fully; always preserve the patient’s dignity where possible and avoid hypothermia.

Take a history, if possible, and ask other witnesses about recent events.

**Acute clinical scoring systems**

Objective scoring systems are essential tools in identifying patients who are deteriorating clinically, in need of urgent treatment or referral to intensive care. They are also helpful in clinical research, allowing meaningful comparison between patients with varying types of clinical presentation.

**Early warning systems**

There is a clear correlation between markers of disease severity and subsequent in-hospital
mortality. However, the identification of ‘sick’ patients is a largely subjective process, which is often performed poorly.

Early warning systems combine several simple and measurable physiological variables, e.g. respiratory rate, to predict clinical worsening. These systems allow nursing and other staff objectively to assess and monitor ward-level patients, identifying those who need medical review, transfer to ICU.

**Conscious level**

**Glasgow Coma Scale**

The Glasgow Coma Scale (GCS) is an objective and universally comparable way of quantifying the conscious level of a patient. It can be used as a single point value or monitored over time, and combines scores assigned to three physiological responses: eye opening, verbal responsiveness and motor responsiveness.

The GCS was originally used to stratify immediate clinical risk in patients with head injuries. Of those with moderate (9–12) and severe (<9) scores, 63% and 85% respectively remain disabled at 1 year.

It is now used in any condition associated with neurological sequelae and has been incorporated into other scoring systems, including APACHE, and standard neurological observations.

**AVPU**

The AVPU score is an abbreviated scoring system for the assessment of consciousness. It assigns a letter (A, V, P or U) to the patient, depending on whether they are alert, responsive to verbal commands, responsive to pain or unresponsive, respectively.

It is commonly used by ambulance crews. However, it has less of an evidence base than the GCS and is not suitable for longitudinal neurological scoring.

**Critical illness**

**APACHE**

The acute physiology and chronic health evaluation (APACHE) scoring system is used to predict in-hospital mortality in patients admitted to ICU. APACHE IV is the most recent version and combines values assigned to acute physiology, age and chronic health.

**SOFA**

The sequential organ failure score (SOFA) is an alternative critical care score that assesses the function of six different organ systems: respiratory, cardiovascular, renal, hepatic, neurological and haematological.
Trauma Patient's Assessment

1- Pre hospital assessment:
Pre hospital report includes: (MIST AMPLE)

- **M** - Mechanism of Injury
- **I** - Injuries sustained
- **S** - Signs
- **T** - Treatment and trends in the vital signs
- **A** - Allergies
- **M** - Medications
- **P** - Past medical history
- **L** - Last Ate / LMP (in females)
- **E** - Events (This is usually the MIST)

It is important to develop a systemic approach to the trauma patient. The peak of death from trauma occurs within the first few hours after injury. During the initial assessment the health care team must identify the injuries which is life threatening injuries are present, then prioritize care. The assessment is divided into three levels:

- **Primary survey**
- **Secondary survey**
- **Tertiary survey**

**Primary survey**

**Definition of primary survey**: This is the initial assessment of a major trauma patient, and is designed to identify immediate life threatening problems.

The management of severe multiple injuries require clear recognition of management priorities.

The goal of the initial assessment is to determine those injuries that threaten the patient’s life.

If performed correctly, this primary survey should identify such life-threatening injuries such as:

- Airway obstruction
- Chest injuries with breathing difficulties
- Severe external or internal hemorrhage
- Abdominal injuries.

If there is more than one injured patient, treat patients in order of priority (triage).

**The 5 key components of the primary survey in trauma:**
It used to be an ABCDE approach, but recently C (circulation) has become the number one priority in recognition of hypovolaemic shock being a major cause to mortality.

- **Airway Maintenance** (cervical spine control)
- **Breathing and Ventilation**
- **Circulation** (reassess again - this is IMPORTANT)
- **Disability** (check neurological status)
- **Exposure** (undress patient completely - strip and flip, examining both sides of the patient) - cover as soon as practical to prevent hypothermia.

**(A) Airway maintenance (with cervical spine immobilization)**

1. Assess the airway and determine its adequacy, patency and air exchange.
2. Create or maintain an airway by
   a. Looking with suction
   b. Chin lift or jaw thrust
   c. Naso/Oropharyngeal airway
   d. Orotracheal intubation
   e. Cricothyroidotomy
3. Check for presence of foreign bodies, facial/mandibular fracture, and tracheal injury.
4. Recognize the potential for cervical spine injury and maintain the spine in a safe neutral position until clinical examination and radiological findings exclude injury. Support the patient's neck manually or use a semi-rigid collar around it. Further support is achieved by placing a sandbag by each of the patient's ears and applying tape across his forehead to the sides of the trolley.

**(B) Breathing:**

1. Assess breathing adequacy (Airway patency does not equal adequate ventilation).
2. Assess the chest by
   a. Inspection for bilateral chest symmetry, chest movement and wounds)
   b. Palpation to assess the position of the trachea
   c. Percussion for the chest bilaterally
   d. Auscultation for bilateral air entry
3. Assess respiration for rate, depth, and effort.
4. Assess skin color, breath sounds, chest wall movement and integrity.
5. Administer high flow oxygen through non-rebreather mask  
6. Consider artificial ventilation  
7. Recognize and treat:  
   a. Tension pneumothorax  
   b. Massive haemothorax  
   c. Flail chest  
   d. Sucking chest wounds  
   e. Pericardial tamponade  

(C) **Circulation:**  
1. Assess circulation by:  
   - Looking for external hemorrhage and apply manual pressure  
   - Observing skin color, temperature and capillary refill  
   - Feeling and measuring the pulse  
   - Taking the blood pressure  
   - Assessing neck veins  
   - Monitoring the patient with an ECG  

(D) **Disability:**  
1. Assess level of consciousness using "AVPU":  
   A- Is the patient **Alert**?  
   V-Does the patient response to **Voice**?  
   P-Does the patient respond to **Painful** stimulus?  
   U- Is the patient **Unresponsive** even to painful stimulus?  
2. Assess level of consciousness by Glasgow coma scale (GCS)  
   a. Are the eyes open?  
   b. Talk to the patient  
   c. Use painful stimulus to finger or toe if required  
3. Assess the pupillary size and response.  

(E) **Exposure/Environmental control:**  
1. Undress and expose the patient so that an adequate complete examination can be performed.  
2. Inspection of body for injuries  
3. Prevent the patient becoming hypothermic, measure their temperature.  

☐ **Secondary survey**
Definition: The secondary survey is a head-to-toe examination of the patient looking for other injuries, which are not life threatening. It is carried out after the primary survey and immediate resuscitation/management of potential life threats in a stable patient to identify the presence of other injuries missed in the focused primary survey. It involves:

1. **Head to toe examination**

   **Head-to-toe assessment:**
   - **Head and maxilla-facial:**
     - Inspect and palpate head and face (lacerations, contusions, fractures, other injury)
     - Pupils and level of consciousness
     - Eyes (injury, hemorrhage, contact lens, dislocation of lens)
     - Ears and nose for cerebrospinal fluid
     - Mouth
   - Cranial nerves
     - Cervical spine and neck:
       - Inspect for signs of injury, tracheal deviation
       - Palpate for tenderness, deformity, swelling, subcutaneous emphysema
       - Palpate the spinal column for loss of normal continuity and abnormal curves, and ask the patient to indicate any areas of pain.
     - Auscultate for carotid bruits
       - Chest:
       - Inspect Chest for injury
       - Auscultate for breath sounds
       - Palpate entire chest
       - Percussion the chest
     - Abdomen:
       - Inspect for signs of injury or bleeding
       - Auscultate for bowel sound
       - Percuss and palpate
     - Perineum/Rectum/Genitalia:
       - Examine rectal blood, sphincter tone
       - Observe for bleeding or other injury to genitalia
   - Musculoskeletal system:
     - Inspect extremities for signs of injury
     - Palpate (tenderness, crepitation, abnormal movement, sensation)
- Check all pulses
- Assess pelvis, lumbar and thoracic spine
  - Neurological status:
- Re-evaluate pupils and level of consciousness
- Determine GCS
- Evaluate for paralysis, paresis, motor, and sensory responses of extremities
  - Diagnostic tests/ radiological assessment

2. Assess vital signs.

3. Obtain person's history (AMPLE):
   - A  Allergies
   - M  Medications
   - P  Past illnesses
   - L  Last meal
   - E  Events related to injury
     1. Blunt
     2. Penetrating
     3. Burns
     4. Hazardous Environment

☐ Tertiary assessment

The tertiary survey is a repetition of the secondary survey that again aims to pick up 'missed' injuries. This may occur on multiple occasions over the days following injury.
Objectives

- Perform complete preoperative assessment.
- Mention the common diagnostic/laboratory studies done preoperatively.
- Perform accurate postoperative assessment.

Preoperative Patient Assessment

The overall goal of the preoperative assessment is to identify risk factors and plan care to ensure patient safety throughout the surgical experience.

Psychological assessment:
Assess the patient for potential stressors that could negatively affects surgery eg, anxiety and fear as fear of pain, fear of death fear of anesthesia and fear of alteration in body image.

A. Obtaining subjective data (health history)

Past Health History:
- Ask the patient about any previous medical problems hospitalization and surgeries.

Medications:
- Document all current routine (eg. Antihypertensive and hypoglycemic drugs) and intermittent medication use, including over-the-counter drugs and herbal supplements.

Allergies:
- Question the patient about drug intolerances and drug allergies.
  - Drug intolerance usually results in side effects that are uncomfortable or unpleasant for the patient but are not life threatening.
- Inquire about nondrug allergies, specifically food allergies.

Review of Systems:

Cardiovascular System.
- Evaluate cardiovascular (CV) function to determine preexisting disease or problems (e.g., coronary artery disease, prosthetic heart valve). In reviewing the CV system, you may find a history of hypertension, angina, dysrhythmias, heart failure, or myocardial infarction. Inquire about the patient’s current treatment for any CV condition.

**Respiratory System.**
- Ask the patient about any recent or chronic respiratory disease or infections. Elective surgery may need to be postponed if the person has an upper respiratory tract infection.
  - Upper airway infections increase the risk of bronchospasm, laryngospasm, decreased O2 saturation, and problems with respiratory secretions.
- If a patient has a history of asthma, inquire about the use of inhaled or oral corticosteroids and bronchodilators, as well as the frequency and triggers of asthma attacks.

**Neurologic System.**
- Preoperative evaluation of neurologic functioning includes assessing the patient’s ability to respond to questions, follow commands, and maintain orderly thought patterns.
- Inquire about any history of strokes, transient ischemic attacks, or spinal cord injury.
- Document the patient’s ability to pay attention, concentrate, and respond appropriately to establish a preoperative baseline for postoperative comparison.

**Genitourinary System.**
- Assess the preoperative patient for a history of renal or urinary tract diseases.

**Hepatic System.**
- Inquire about the presence of liver diseases.
  - The patient with hepatic dysfunction may have an increased perioperative risk for clotting abnormalities and adverse responses to medications.

**Integumentary System.**
- Inquire about a history of skin problems.
- Assess the current condition of the skin, especially at the incision site, for rashes, breakdown, or other dermatologic conditions.
  - A patient with a history of pressure ulcers may require extra padding during surgery.
  - Skin problems can affect postoperative healing.

**Fluid and Electrolyte Status.**
- Ask the patient about any recent conditions that increase the risk for fluid and electrolyte imbalances, such as vomiting or diarrhea.

**Nutritional Status.**
Nutritional deficits include overnutrition and undernutrition, both of which require considerable time to correct.

- Nutritional deficiencies impair the ability to recover from surgery.
- Obesity stresses both the cardiac and pulmonary systems and makes access to the surgical site and anesthesia administration more difficult.
- Obesity predisposes the patient to wound dehiscence, wound infection, and incisional herniation postoperatively.

**B. Obtaining objective data (Physical examination)**

- **Cardiovascular System**
  - Assess for edema (including dependent areas), noting location and severity.
  - Inspect neck veins for distention.
  - Obtain bilateral baseline blood pressures.
  - Assess pulses (bilaterally when appropriate) for rate, rhythm, and quality: apical, radial, and pedal.

- **Respiratory System**
  - Assess baseline respiratory rate and rhythm and regularity of pattern.
  - Observe for cough, dyspnea, and use of accessory muscles of respiration.
  - Auscultate lungs for normal and adventitious breath sounds.

- **Neurologic System**
  - Assess orientation to person, place, and time.
  - Assess baseline mental status. Note presence of confusion, disorderly thinking, or inability to follow commands.

- **Genitourinary System**
  - Note color, amount, and characteristics of urine (if appropriate).
  - Determine pregnancy status (if appropriate).

- **Hepatic System**
  - Inspect skin color and sclera of eyes for any signs of jaundice.

- **Integumentary System**
  - Determine skin status. Note drying, bruising, or breaks in surface.
  - Inspect skin for rashes, boils, or infection, especially around the planned surgical site.
  - Inspect the mucous membranes and skin turgor for signs of dehydration.
  - Assess skin moisture and temperature.

- **Musculoskeletal System**
  - Examine skin around bone pressure points.
• Assess for limitations in joint range of motion and muscle strength.
• Assess for joint or muscle pain.
• Assess mobility, gait, and balance.

- **Gastrointestinal System**
  • Assess for the presence of dentures and bridges (loose dentures or teeth may be dislodged during intubation).
  • Weigh patient.
  • Auscultate abdomen for presence of bowel sounds.

- **Immune System**
  • Identify any immunodeficiency or autoimmune disorders.
  • Assess for use of corticosteroids or other immunosuppressant drugs.

**Laboratory and Diagnostic Tests**

<table>
<thead>
<tr>
<th>Test</th>
<th>Assessment</th>
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</thead>
<tbody>
<tr>
<td>ABGs, pulse oximetry</td>
<td>Respiratory and metabolic function, oxygenation status</td>
</tr>
<tr>
<td>Blood glucose</td>
<td>Metabolic status, diabetes mellitus</td>
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<tr>
<td>Blood urea nitrogen, creatinine</td>
<td>Renal function</td>
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<tr>
<td>Chest x-ray</td>
<td>Pulmonary disorders, cardiac enlargement, heart failure</td>
</tr>
<tr>
<td>Complete blood count: RBCs, Hgb, Hct, WBCs, WBC differential</td>
<td>Anemia, immune status, infection</td>
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<tr>
<td>Electrocardiogram</td>
<td>Cardiac disease, dysrhythmias</td>
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<tr>
<td>Electrolytes</td>
<td>Metabolic status, renal function, diuretic side effects</td>
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<tr>
<td>hCG</td>
<td>Pregnancy status</td>
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<tr>
<td>Liver function tests</td>
<td>Liver status</td>
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<tr>
<td>PT, PTT, INR, platelet count</td>
<td>Coagulation status</td>
</tr>
<tr>
<td>Pulmonary function studies</td>
<td>Pulmonary status</td>
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<tr>
<td>Serum albumin</td>
<td>Nutritional status</td>
</tr>
<tr>
<td>Type and crossmatch</td>
<td>Blood available for replacement (elective surgery patients may have own blood available)</td>
</tr>
<tr>
<td>Urinalysis</td>
<td>Renal status, hydration, urinary tract infection</td>
</tr>
</tbody>
</table>
Postoperative assessment

Initial Assessment in post anesthesia care unit (PACU).
The goal of PACU care is to identify actual and potential patient problems that may occur as a result of anesthesia and surgery and to intervene appropriately.

- On admission of the patient to the PACU, you should receive a complete post anesthesia admission report including:

  A. General patient's Information
  - Patient name
  - Age
  - Anesthesia care provider
  - Surgeon
  - Surgical procedure
  - Type of anesthesia e.g., general or regional (spinal or epidural)

  B. Patient History
  - Indication for surgery
  - Medical history, medications, allergies
  - Preoperative or baseline vital signs, level of consciousness, orientation

  C. Intraoperative Management
  - Anesthetic medications
  - Other medications received preoperatively or intraoperatively
  - Last dose of opioid administration
  - Total fluid replacements, including blood transfusions
  - Total fluid losses (e.g., blood, nasogastric drainage)
  - Urine output

  D. Intraoperative Course
  - Unexpected anesthetic events or reactions
  - Unexpected surgical events
  - Most recent vital signs and monitoring data
  - Results of intraoperative laboratory tests, if done

PACU assessment:
Because hearing is the first sense to return in the unconscious patient, explain all activities to the patient from the moment of admission to the PACU.

A) Airway:
- Assess airway patency.
B) Breathing:
- Assess respiratory rate and quality
- Auscultate breath sounds
- Apply pulse oximetry and monitor patient's oxygen saturation to provide an early warning of hypoxemia
- Assess patient for signs of inadequate oxygenation including:
  a. **Central nervous system manifestations** (Restlessness, agitation, confusion, muscle twitching, seizures and coma)
  b. **Cardiovascular System manifestations** (Hypertension, hypotension, tachycardia, bradycardia, dysrhythmias, delayed capillary refill and decreased O2 saturation)
  c. **Integumentary system manifestations** (Flushed and moist skin and cyanosis)
  d. **Respiratory system manifestations** (Increased to absent respiratory effort, use of accessory muscles, abnormal breath sounds and abnormal arterial blood gases)
  e. **Renal System manifestations** (Urine output <0.5 mL/kg/hr)

C) Circulation:
- ECG monitoring. Note and evaluate deviations in ECG results from preoperative findings.
- Measure blood pressure and compare it with baseline readings
- Measure body temperature
- Assess capillary refill
- Assess color and temperature of skin
- Assess peripheral pulses
- Note the presence of all IV lines; all irrigation solutions and infusions; and all output devices, including catheters and wound drains.

D) Neurological assessment:
- Assess level of consciousness. *The patient may be awake, drowsy but arousable, or asleep*
  - Check patient's orientation
  - If the patient received a regional anesthetic, assess sensory and motor status
  - Assess pupil size and reaction

E) Gastrointestinal:
- Monitor and record for presence of nausea or vomiting
- Record fluids intake

F) Genitourinary: - Monitor output (urine, drains)

G) Surgical Site assessment: - Assess the surgical site, noting the condition of any dressings
and the type and amount of any drainage.

H) **Pain:** - Assess pain at the incision site
<table>
<thead>
<tr>
<th>Procedures</th>
<th>Excellent (2 scores)</th>
<th>Satisfactory (1 score)</th>
<th>Needs Practice (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform hand hygiene and put on PPE, if indicated.</td>
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<tr>
<td>Identify the patient.</td>
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<tr>
<td>Close curtains around bed and the door to the room, if possible.</td>
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<td>Explain the purpose of the health examination to the patient.</td>
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<td>Have the patient remove shoes and heavy outer clothing.</td>
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<td>Weigh the patient using a scale</td>
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<td>Measure the patient’s height using a wall-mounted measuring device with shoes off, and patient standing erect.</td>
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<tr>
<td>Calculate the patient’s BMI using weight and height measurements.</td>
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<tr>
<td>Assess patient for signs of distress e.g. Cardiac or respiratory problem or pain.</td>
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<tr>
<td>Assess skin color.</td>
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<tr>
<td>Assess patient's dressing, grooming and personal hygiene.</td>
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<tr>
<td>Observe patient for obvious deformities.</td>
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<td>Assess patient’s posture, gait and mobility.</td>
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<td>Assess patient’s behavior and manner.</td>
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<tr>
<td>Smell odor of body and breath.</td>
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<td>Observe facial expressions.</td>
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<tr>
<td>Check and record level of consciousness.</td>
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<td>Measure body temperature.</td>
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<tr>
<td>Measure pulse and respiration.</td>
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<td>Measure blood pressure.</td>
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<tr>
<td>Assess pain using pain scale.</td>
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<td>- Location</td>
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<td>- Quality</td>
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</tbody>
</table>
- Onset
- Duration
- Severity
- Contributing/associated factors

- Remove PPE.
- Perform hand hygiene.
- Document patient's assessment data appropriately.
### Assessing the Skin, Hair, and Nails

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<tr>
<td>• Close curtains around bed and the door to the room, if possible.</td>
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<tr>
<td>• Explain the purpose of the health examination to the patient.</td>
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<tr>
<td>• Ask the patient to remove all clothing and put on an examination gown</td>
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<td>(if appropriate).</td>
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<tr>
<td>• Expose only the body part being examined.</td>
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<tr>
<td>• Use drape to cover any exposed area other than the one being assessed.</td>
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<tr>
<td>• Inspect the overall skin coloration.</td>
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<tr>
<td>• Inspect skin for vascularity, bleeding, or bruising.</td>
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<tr>
<td>• Inspect the skin for lesions. Note bruises, scratches, cuts, insect bites,</td>
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<tr>
<td>and wounds (If present, note size, shape, color, exudates, and</td>
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<tr>
<td>distribution).</td>
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<tr>
<td>• Palpate skin using the backs of your hands to assess temperature.</td>
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<tr>
<td>• Wear gloves when palpating any potentially open area of the skin.</td>
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<tr>
<td>• Palpate for skin texture and moisture.</td>
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<tr>
<td>• Assess for skin turgor by gently pinching the skin under the clavicle.</td>
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<tr>
<td>• Assess skin odor.</td>
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<tr>
<td>• Palpate for edema and its degree if present.</td>
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<tr>
<td>• Inspect the nail condition, including the shape and color as well as the</td>
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<tr>
<td>nail angle, note if any clubbing is present.</td>
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<tr>
<td>• Palpate nails for texture</td>
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<tr>
<td>• Assess capillary refill.</td>
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<tr>
<td>• Inspect the hair for color, distribution, quantity, presence of brittle</td>
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<tr>
<td>hair or alopecia.</td>
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</tbody>
</table>
- Wear gloves for palpation if lesions or infestation is suspected or if hygiene is poor.
- Remove gloves.
- Perform hand hygiene.
- Document patient's assessment data appropriately.

(Appendix III)
Assessing the Head and Neck

Procedures

- Perform hand hygiene and put on PPE, if indicated.
- Identify the patient.
- Close curtains around bed and the door to the room, if possible.
- Explain the purpose of the health examination to the patient.

Head and face assessment:
- Inspect the head for shape.
- Palpate the skull with fingertips for masses.
- Inspect the face for color, symmetry, lesions, and distribution of facial hair.
- Note facial expression during rest and conversation.

Eye assessment:
- Inspect the external eye structures (eyelids, eyelashes, eyeball, and eyebrows) for color, edema, symmetry, and alignment.
- Direct a penlight from the sides into the eyes to observe the cornea for intactness (presence of lesions or discoloration).
- Look for excessive tearing or dryness of the eyes.
- Inspect the sclera and conjunctiva for color while asking the patient to look up and depress lower lids with thumbs.
- Observe lens for opacity.
- Ask the patient close the eyes and press lightly on the eyelid over the eyeball (to estimate intraocular pressure).
- Examine the pupils for equality of size, shape, and reaction to light by darkening the room and using a penlight to shine the light on each
pupil.
- Ask the patient to focus on an object as you bring it closer to the nose (to test for pupillary accommodation and convergence).
- Ask the patient to read the newspaper, first with both eyes and then with one eye at a time to test the patient’s visual acuity.

Nose assessment:
- Inspect the external nose for shape, size, deviation and nasal discharge.
- Test for sense of smell.
- Occlude one nostril while patient breathes in and out through the other; repeat for the other side.
- Palpate and lightly percuss over the frontal and maxillary sinuses.

Mouth assessment:
- Inspect the lips, oral mucosa, gingivae, teeth, and salivary gland
- Inspect the soft and hard palate, uvula, tonsils, and pharynx for color and symmetry, swelling, ulceration, or tonsillar enlargement using a tongue blade and penlight.
- Inspect the tongue by asking the patient to stick out the tongue.
- Inspect the uvula by asking the patient to say “ahh” while sticking out the tongue.

Ear assessment:
- Inspect the external ear bilaterally for shape, size, and lesions.
- Test auditory acuity by asking client to indicate if he or she hears normal sounds as you make them.
- Note color, quantity, and consistency of any discharge from the ears.
- Insert an otoscope slowly into the external ear canal to observe for cerumen (color and amount) and observe the eardrum for color and integrity.
- Palpate the temporomandibular joint by placing your index finger over the front of each ear as you ask the patient to open and close the mouth.

Neck assessment:
- Inspect and palpate the left and then the right carotid arteries.
- Auscultate the carotid arteries using the bell of the stethoscope.
- Inspect and palpate for tracheal deviation using fingertips from behind the patient.
- Palpate the thyroid gland for masses or enlargement.
- Inspect the ability of the patient to move the neck.
- Palpate the lymph nodes anterior and posterior to the ear, occipital, cervical, submandibular, and submental lymph nodes for tenderness and swelling using the finger pads in a slow, circular motion.
- Remove gloves.
- Perform hand hygiene.
- Document patient's assessment data appropriately.
(Appendix IV)

Neurological Assessment

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Excellent (2 scores)</th>
<th>Satisfactory (1 score)</th>
<th>Needs Practice (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Perform hand hygiene and put on PPE, if indicated.</td>
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<tr>
<td>• Identify the patient.</td>
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<tr>
<td>• Close curtains around bed and the door to the room, if possible.</td>
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<tr>
<td>• Explain the purpose of the health examination to the patient.</td>
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<tr>
<td><strong>Assess the patient’s mental status.</strong></td>
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<tr>
<td>- Evaluate level of consciousness using GCS.</td>
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<tr>
<td>- Observe patient’s speech and language abilities.</td>
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<tr>
<td>- Evaluate the patient’s orientation to person, place, and time.</td>
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<tr>
<td>- Assess attention span observing patient's ability to focus on and respond to your questions.</td>
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<tr>
<td>- Assess memory (immediate recall and past memory).</td>
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<tr>
<td>- Evaluate the patient’s ability to understand spoken and written word.</td>
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<tr>
<td>- Assess judgment.</td>
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<tr>
<td><strong>Test cranial nerve function.</strong></td>
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<tr>
<td>- Ask the patient to smile, frown, wrinkle forehead, and puff out cheeks.</td>
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<td>- Ask the patient to identify the smell of different substances with the eyes closed.</td>
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<td>- Test visual acuity by asking the patient to read newspaper.</td>
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<tr>
<td>- Test visual field.</td>
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<tr>
<td>- Assess eye lid for presence of ptosis.</td>
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<tr>
<td>- Ask the patient to move eyes to follow an object through the six positions.</td>
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<tr>
<td>- Assess pupillary constriction to light reflex using penlight.</td>
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<tr>
<td>- Assess pupils’ constriction with near vision.</td>
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<tr>
<td>- Assess corneal reflex.</td>
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</tbody>
</table>
- Asses the patient’s ability to discriminate different tastes.
- Use tuning fork to test hearing acuity.
- Test the gag reflex by touching the posterior pharynx with the tongue depressor.
- Ask the patient to rotate the head right and left and shrug shoulders against resistance.
- Ask the patient to protrude the tongue.

**Motor System Assessment**
- Test muscle strength by asking the patient to push and pull against the resistance of your arm.
- Test muscle tone by passively moving the limbs through their range of motion.
- Note any involuntary movements.
- Test balance and coordination using the Romberg test.
- Test coordination using finger-to-nose test.

**Sensory System Assessment**
- Ask patient to close eyes.
- Test light touch sensation.
- Test pain sensation.
- Assess sensation of temperature
- Assess sensation of vibration
- Stroke the lateral side of the patient’s foot with a tongue blade or the handle of a reflex hammer to test Babinski sign.

- Remove PPE.
- Perform hand hygiene.
- Document patient’s assessment data appropriately.
## (Appendix V)
### Chest and lung assessment

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Excellent (2 scores)</th>
<th>Satisfactory (1 score)</th>
<th>Needs Practice (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Perform hand hygiene.</td>
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<tr>
<td>• Identify the patient.</td>
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<tr>
<td>• Close curtains around bed and the door to the room, if possible.</td>
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<tr>
<td>• Explain the purpose of the health examination to the patient.</td>
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<tr>
<td>• Assist the patient to a sitting position.</td>
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<tr>
<td>• Look for symmetry of chest wall expansion.</td>
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<tr>
<td>• Assess the respiratory characteristics.</td>
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<tr>
<td>• Observe patient's position during respiration.</td>
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<tr>
<td>• Observe color of skin, lips, nails and tongue.</td>
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<tr>
<td>• Look to see if the patient uses accessory muscles of respiration (neck,</td>
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<tr>
<td>shoulder, or abdominal muscles).</td>
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<tr>
<td>• Observe for intercostal retractions, nasal flaring, or pursed lip</td>
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<tr>
<td>breathing.</td>
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<tr>
<td>• Look at the patient's posture.</td>
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<tr>
<td>• Help the patient undress, if needed, and provide a patient gown.</td>
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<tr>
<td>• Assess the anteroposterior and lateral diameters of the thorax.</td>
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<td>• Assess thoracic expansion by standing behind the patient, placing</td>
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<td>both thumbs on either side of the patient’s spine. Ask the patient to</td>
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<tr>
<td>take a deep breath and note movement of your hands.</td>
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<tr>
<td>• Observe patient’s finger nails for clubbing.</td>
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<tr>
<td>• Percuss the lung to assess the density or aeration of the lungs.</td>
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<tr>
<td>• Auscultate the breathe sound in each area of the lung using the</td>
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<tr>
<td>diaphragm of stethoscope while instructing the patient to breathe</td>
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<tr>
<td>slowly and deeply through the mouth.</td>
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<tr>
<td>• Perform hand hygiene.</td>
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<tr>
<td>• Document patient’s assessment data appropriately.</td>
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</tbody>
</table>
### Cardiovascular system assessment

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Excellent (2 scores)</th>
<th>Satisfactory (1 score)</th>
<th>Needs Practice (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Perform hand hygiene.</td>
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<tr>
<td>• Identify the patient.</td>
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<tr>
<td>• Close curtains around bed and the door to the room, if possible.</td>
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<tr>
<td>• Explain the purpose of the health examination to the patient.</td>
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<tr>
<td>• Help the patient undress, if needed, and provide a patient gown.</td>
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<tr>
<td>• Assist the patient to a supine position with the head elevated about 30 to 45 degrees and expose the anterior chest.</td>
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<tr>
<td>• Assess the pulse rate, rhythm, and quality of the arterial blood vessel.</td>
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<tr>
<td>• Measure BP bilaterally.</td>
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<tr>
<td>• Inspect and palpate the left and then the right carotid arteries.</td>
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<tr>
<td>• Use drape to cover any exposed area other than the one being assessed.</td>
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<tr>
<td>• Inspect the neck for jugular vein distention, observing for pulsations.</td>
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<tr>
<td>• Inspect the skin for ulcerations or sores that don’t heal, pallor, coolness that suggests arterial or venous insufficiency.</td>
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<tr>
<td>• Inspect skin color for cyanosis or pallor.</td>
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<tr>
<td>• Inspect the extremities for conditions such as edema, clubbing of the nail beds and varicosities.</td>
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<tr>
<td>• Palpate the upper and lower extremities for temperature, moisture, pulses, and edema bilaterally.</td>
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<tr>
<td>• Compare the characteristics of the arteries on the right and left extremities to determine symmetry.</td>
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<tr>
<td>• Assess capillary refill.</td>
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<tr>
<td>• Palpate patient’s chest for thrill over the fifth left intercostals space close to the sternum and in the left midclavicular line.</td>
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<tr>
<td>• Auscultate the carotid arteries, abdominal aorta, and femoral artery</td>
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</tbody>
</table>
- Auscultate apical pulse while palpating radial pulse.
- Listen to the auscultatory areas in sequence (pulmonary, aortic, tricuspid and mitral) using the stethoscope.
- Perform hand hygiene.
- Document patient's assessment data appropriately.
(Appendix VII)
Abdominal Assessment

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Excellent (2 scores)</th>
<th>Satisfactory (1 score)</th>
<th>Needs Practice (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Perform hand hygiene and put on PPE, if indicated.</td>
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<tr>
<td>• Identify the patient.</td>
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<tr>
<td>• Close curtains around bed and the door to the room, if possible.</td>
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<tr>
<td>• Explain the purpose of the health examination to the patient.</td>
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</tr>
<tr>
<td>• Help the patient undress, if needed, and provide a patient gown.</td>
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<tr>
<td>• Assist the patient to a supine position and expose the abdomen.</td>
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<tr>
<td>• Use drape to cover any exposed area other than the one being assessed.</td>
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<tr>
<td>• Inspect the abdomen for skin color, contour, pulsations the umbilicus,</td>
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<tr>
<td>and other surface characteristics (rashes, lesions, masses, scars).</td>
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<tr>
<td>• Auscultate all four quadrants of the abdomen for bowel sounds</td>
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<tr>
<td>systematically using the diaphragm of the stethoscope.</td>
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<tr>
<td>• Auscultate the abdominal aorta for vascular sounds by using the bell of</td>
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<tr>
<td>the stethoscope.</td>
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<tr>
<td>• Percuss the four quadrants abdomen.</td>
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<tr>
<td>• Palpate the abdomen lightly in all four quadrants and then palpate</td>
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<tr>
<td>using deep palpation technique.</td>
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<tr>
<td>• Palpate for the kidneys on each side of the abdomen.</td>
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<tr>
<td>• Palpate the liver at the right costal border.</td>
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<tr>
<td>• Palpate for the spleen at the left costal border.</td>
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<tr>
<td>• Palpate then auscultate the femoral pulses in the groin.</td>
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<tr>
<td>• Assist the patient in replacing the gown.</td>
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<tr>
<td>• Remove PPE.</td>
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<tr>
<td>• Perform hand hygiene.</td>
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<tr>
<td>• Document patient's assessment data appropriately.</td>
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</table>
# (Appendix VIII)
## Musculoskeletal Assessment

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Excellent (2 scores)</th>
<th>Satisfactory (1 score)</th>
<th>Needs Practice (0)</th>
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</thead>
<tbody>
<tr>
<td>• Perform hand hygiene.</td>
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</tr>
<tr>
<td>• Identify the patient.</td>
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<tr>
<td>• Close curtains around bed and the door to the room, if possible.</td>
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<tr>
<td>• Explain the purpose of the health examination to the patient.</td>
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<tr>
<td>• Inspect the head and neck and proceed to the upper extremities,</td>
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<tr>
<td>lower extremities, and trunk.</td>
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<tr>
<td>• Note the patient’s general body build and symmetry of joints.</td>
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<tr>
<td>• Observe for any swelling, deformity, nodules or masses, and discrepancies in limb length or muscle size.</td>
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<tr>
<td>• Palpate area of complaint or that appears abnormal on inspection.</td>
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<tr>
<td>• Palpate both muscles and joints to evaluate skin temperature, local tenderness, swelling, and crepitus.</td>
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<tr>
<td>• Grade the muscles’ strength during contraction bilaterally, with full resistance to opposition.</td>
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<tr>
<td>• Have the patient apply resistance to the force the examiner is exerting.</td>
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<td></td>
</tr>
<tr>
<td>• Perform hand hygiene.</td>
<td></td>
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<td>• Document patient’s assessment data appropriately.</td>
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</table>
# Breast and Lymphatic System Assessment

## Procedures

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Excellent (2 scores)</th>
<th>Satisfactory (1 score)</th>
<th>Needs Practice (0)</th>
</tr>
</thead>
</table>

- Perform hand hygiene.
- Identify the patient.
- Close curtains around bed and the door to the room, if possible.
- Explain the purpose of the health examination to the patient.
- Ask the patient to undress.
- Ask patient to sit with arms hanging freely.
- Inspect the breast for size and symmetry.
- Inspect the breasts, areolas, nipples, and axillae for any swelling, nodules, or ulceration.
- Inspect the breast and axillary skin for rashes or infection and texture.
- Inspect superficial venous pattern.
- Inspect the areolas of both breasts for the color, size, shape, and texture.
- Inspect the nipples for any retraction and dimpling, dryness, lesions, bleeding, or discharge.
- Palpate the breast for texture and elasticity.
- Palpate the breast for tenderness and temperature.
- Wear gloves.
- Compress the nipple gently with thumb and index finger.
- Hold the client’s elbow with one hand, and use the three finger pads of the other hand to palpate firmly the axillary lymph nodes.
- Remove gloves.
- Perform hand hygiene.
- Document patient's assessment data appropriately.
REFERENCES


Book Coordinator; Mostafa Fathallah

General Directorate of Technical Education for Health