Hemodynamic Monitoring:

WHY IS IT GIVEN?

Hemodynamic monitoring measures cardiac output and intracardiac pressure.

HOW DOES THE TEST WORK?

A balloon-tipped catheter is inserted into the pulmonary artery, usually through the femoral artery. It is able to measure pressures in the heart's various chambers and vessels.

WHAT TO DO?

Before the test:

1. Obtain written consent from the patient to ensure he or she understands risks and benefits.
2. Explain the test to the patient.

After the test:

1. Determine if there is bleeding at the injection site.
2. Determine if there is infection at the injection site, redness, warmth, swelling, or discomfort.
3. Examine for complications: air embolus, arrhythmia, and clots. Assess for decrease in respiratory effort, increase in respiratory rate, dyspnea.

Chest X-ray

WHY IS IT GIVEN?

Chest x-rays are done to detect size and position of the heart and structural abnormalities of the lungs. HOW DOES THE TEST WORK? An x-ray machine directs x-rays through the chest and onto film positioned behind the patient's back. As x-rays are directed to the patient, some are absorbed by the body and others pass through to the x-ray film. Areas of the body that absorb x-rays appear light on the x-ray film. Dark areas on the film represent x-rays that passed through the body.

WHAT TO DO?

1. Explain the test to the patient and that the patient will be asked to hold his or her breath while the x-ray is taken.
2. Before the test, remove all jewelry, zippers, hooks, and any metal on the part of the body being x-rayed.

Blood Chemistry

WHY IS IT GIVEN?

This provides a profile of the patient's health, including:

1. Electrolyte balance (sodium, potassium, bicarbonate, magnesium, calcium, phosphorus).
2. Kidney function (BUN, creatinine).
3. Liver function: (AST/ALT). (These are enzymes released when the liver is damaged)
4. Diabetes: (serum glucose)
5. Cholesterol level: (cholesterol, LDL, HDL, triglycerides)

6. Cardiac: [creatine kinase (CK) and CK isoenzymes (these are enzymes released if there is damage to the heart muscle), cardiac troponin levels (troponin is a protein in cardiac and skeletal muscles), myoglobin (an early indication of a myocardial infarction), lactate dehydrogenase (LDH), and LDH isoenzymes] These are enzymes released when cardiac tissue is damaged.

HOW DOES THE TEST WORK?

Three to five milliliters of blood is sampled. Different tests require different tubes. The abnormal results are:

1. Electrolyte balance (sodium, potassium, bicarbonate, magnesium, calcium, phosphorus) will be abnormal in fluid imbalance, acid base imbalance.
2. Kidney function (BUN, creatinine) will be elevated in kidney disease.
3. Liver function: (AST/ALT) will be elevated in liver disease.
4. Diabetes: (serum glucose) indicated when fasting glucose is above 125
5. Cholesterol level: (cholesterol, LDL, HDL, triglycerides). Numbers need to be low except for HDL; a higher number is better; abnormal numbers indicate risk for cardiovascular disease.
6. Cardiac: [creatine kinase (CK), CK isoenzymes, cardiac troponin levels, myoglobin, lactate dehydrogenase (LD), and LD isoenzymes]. When elevated, these show injury to cardiac muscle

WHAT TO DO?

1. No exercise before sampling blood, as it may falsely elevate some numbers.

2. NPO, if directed by the physician. Accurate measurements of triglycerides and glucose require a fasting state.
3. No IM injections before sampling. If an injection is necessary, then note the name of the medication, time, and dose and send it along with the sample to the lab, as it may alter results.
4. Check for bleeding at venipuncture site.
5. Fast for 12 hours for serum glucose test.
6. Fast for 12 hours for cholesterol tests to assure accurate triglyceride.

Hematologic Studies

WHY IS IT GIVEN?

This provides a profile of the patient's blood, including:

1. CBC count—reports hemoglobin, hematocrit, and size and shape of red blood cells (RBC) that help in oxygen transport. Their average lifespan is 120 days and they are formed in the bone marrow. A test is often performed to assess anemia, shortness of breath, response to medication, hemorrhage, surgery, and trauma.
2. WBC count—shows the level of white blood cells in the current circulation. WBCs are responsible for fighting infection in the body. There are five subtypes of WBCs: neutrophils, basophils, eosinophils, lymphocytes, and monocytes. WBCs are often drawn to determine infection, inflammation, allergic response, and parasitic infection.
3. Erythrocyte sedimentation rate (ESR) is a nonspecific test to show infection and inflammation.
4. Coagulation studies [prothrombin time (PT), INR (Internationalized Normalized Ratio), partial thromboplastin

time (PTT), platelet count]. These are bleeding time tests to indicate the patient's clotting ability. Most interfere at some point in the clotting cascade. INR is used to monitor stable patients taking warfarin. PT is used to help screen patients taking warfarin. Since PT is made in the liver, this test is also useful to monitor liver functions. Abnormalities in the PTT indicate defects in the patient's coagulation status and with blood factors. Used to monitor heparin therapy.

HOW DOES THE TEST WORK?

Three to five milliliters is sampled. The abnormal results are:

1. RBC count—usual indication is to look for anemia.
2. WBC count—when elevated, it shows infection.
3. Erythrocyte sedimentation rate (ESR)—shows inflammation when elevated.
4. Bleeding (prothrombin time, INR, partial thromboplastin time, platelet count) —measure clotting of blood.
5. Hemoblogin (Hgb) and hematocrit (Hct) show the level of iron- and oxygencarrying capability of the blood.

WHAT TO DO?

Check for bleeding at venipuncture site.

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Purpose of Assessment

The information gathered during an assessment is not merely collected and recorded. It is used to evaluate health status and to make a judgment about:

1. Whether a problem or potential problem exists that requires nursing intervention.
2.Status of a previously identified problem or condition in relation to projected outcomes.
3. Strengths present in the situation, be it an individual, family, or community, that can be used to help solve problems.

Nursing process in Nursing Health Assessment

Nursing process

Based on the scientific method, the nursing process is a systematic way of approaching any health problem. To use the nursing process, you'll follow the following five steps:

- Assess the patient.
- Formulate nursing diagnoses.
- Plan your care.
- Implement your plan.
- Evaluate the results.

Assessment

The first and most important step of the nursing process, assessment involves

- Collecting all the relevant information needed to solve a health problem.
- Interpretation of data.

Nursing diagnoses

After collecting all the appropriate data about a patient's health problem, you'll use it to formulate your nursing diagnoses. Unlike medical diagnoses, which focus on diseases, nursing diagnoses focus on the patient's response his actual and potential health problems. These responses may be physical, emotional, psychological, cultural, and spiritual.

Plan of care

Just as the nursing diagnoses grow from the assessment findings, the plan of care grows from your nursing diagnoses. Creating a useful plan takes nursing experience and awareness of the patient's individuality. This individuality, of course, should already be reflected in your nursing diagnoses.

Implementation

After you've established your plan, you need to put it into action. This may require:

• ***Interdependent actions***, such as coordinating the contributions of other health care team members

• ***Dependent actions***, such as carrying out a doctor's orders

• ***Independent actions***, such as applying nursing interventions. Implementation can be the most creatively demanding step of the nursing process

Evaluation

In this last step of the nursing process, you evaluate the success of your plan by determining whether goals have been met. Thus, this step allows you to maintain a dynamic plan of care over time as the patient moves through the stages of illness and recovery.

Data collection.

The types of Data can be objective or subjective.

1. **Objective data (**Signs) are detectable by an observer or can be tested against an accepted standards.

They can be seen, heard, felt, smelled, or measured. For example, a discoloration of skin, a blood pressure reading, the act of crying, , swollen joint, or a hand tremor. On the other hand the ***Objective data*** can be collected by physical examination, diagnostic and laboratory test results, pertinent nursing and medical literature

2. **Subjective data** (Symptoms) are apparent only to the person affected and can be described or verified only by that person.

Itching, pain, and feeling worried are examples of subjective data. ***Subjective data*** can collected from the client, family, significant others, health care team members, and health records.

Sources of Data

1. Primary (direct source): the patient; is always the best source of data. The client can usually provide subjective data that no one else can offer

2. Secondary (indirect source):

Significant others, health personnel, medical records.

The Role of the Nurse in Health Assessment

1. Prepare patient, environment, and equipment needed for assessment.
2. Explain the assessment procedure and expected patient's feeling during examination to patient or family.
3. Ensure that all needed format and documentation papers are included in patient's file.
4. Keep privacy for the patient.
5. The nurse obtains the patient's health history and performs a physical assessment, which can be carried out in a variety of settings, including :(***the acute care setting, clinic or outpatient office, school, long-term care facility, or the home***).
6. A growing list of nursing diagnoses is used by nurses to identify and categorize patient problems that nurses have the knowledge, skills, and responsibility to treat independently.

7. Reporting and documenting the procedure with its finding.

8. Orient the patient about the result of assessment including normal and abnormal findings, and the actions that should be carried out to correct the abnormalities.

Guidelines In conducting health assessment

A. Preparing the patient

to ensure an accurate assessment and physical examination. The patient must be properly prepared physically and psychologically. To prepare the patient properly, the nurse will:

1.prepare for patient's physical comfort, by allowing the opportunity to empty the bowel and bladder.

2. keep privacy while the patient changes into a gown and gives patient time to understand, assisting if necessary.

3. Help the patient assume proper positions during examination so that body parts are accessible and the patient stay comfortable.

4. Thoroughly explain what will be done, what the patient should expect to feel, and how the patient can cooperate.

5. Encourage patient to ask questions and mention discomfort felt during examination.

6. Have a witness or third person present in the examination room during examination of genitalia when patient and nurse are of opposite genders.

7. Pace or time examination process according to the patient's physical and emotional tolerance.

B: preparing the environment

To promote patient comfort and ensure an efficient examination, the examination room should have the following features.

1. Privacy for the patient.
2. Curtains or dividers to enclose the patient's bed.
3. Warm room with comfortable temperature.
4. Proper examination clothing for the patient.
5. Adequate lighting.
6. Control of outside noises.
7. Precautions to prevent interruptions by visitors or other health care personnel.
8. A bed or table set at examiner's waist leve

C. preparing equipment.

The nurse uses a variety of equipment throughout the assessment process.

Equipment and supplies needed for performing a physical examination

Equipment	Function
Incontinent sheet	Protect bed linen from getting soiled
Drapes	Ensure privacy for the client.
Gloves	Prevent cross infection.
Gown for patient	For easy access of different body parts.
Paper towel	Dry hands and arms and to wipe equipment.

Percussion hammer	Test various reflexes of the body.
Height/ weight scale	For measure body weight and height.
Specimen containers	Collect specific sample for laboratory evaluation.
Sphygmomanometer and cuff	Measure blood pressure.
Stethoscope	Auscultator different bogy sounds
Tape measure	Measure body parts. e.g. abdominal girth.
Thermometer	Measure body temperature
Tongue depressor	Facilitate visualizing pharynx and tonsils.
Wrist watch with second hands	Record time of examination as needed.
Cotton applicators	Examine superficial sensation of the skin including corneal reflex.
Eye chart (Snellen chart	Test visual acuity
Flashlight	Facilitate visualization for Ear, Nose, and Throat and to check corneal reflex.
Lubricant	Lubricate instrument used in rectal and vaginal examination.
Otoscope	Examine outer ear and the tympanic membrane
Ophthalmoscope	Examine fundus of the eye.
Sterile safety pin	Examine deep sensation of the skin.
Tuning fork	Test hearing acuity
Vaginal speculum	Facilitate vaginal examination
Proctoscopy	Facilitate rectal examination
Spirometer	Facilitate breathing examination

Ethical issues

Whenever information is elicited from a person through a health history or physical examination,

The person has the right to know why the information is sought and how it will be used. For this reason, it is important:

- to explain what the history and physical examination are,
- how the information will be obtained,
- And how it will be used.
- It is also important that the person be aware that the decision to participate is voluntary.
- A private setting for the history interview and physical examination promotes trust and encourages open, honest communication.
- After the history and examination are completed, the nurse selectively records the data pertinent to the patient's health status.
- This written record of the patient's history and physical examination findings is then maintained in a secure place and made available only to those health professionals directly involved in the care of the patient. This protects confidentiality and promotes professional conduct.

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Nursing health history

Taking a nursing history requires tact and sensitivity. The nurse must put the patient at ease while making sure he or she receives all appropriate information.

Therefore, begin history taking in a friendly, professional manner, and provide smooth transitions across topics. A continual thread throughout the assessment is interpreting the meaning of verbal and nonverbal cues.

■The **history** is the patient's verbal reports, the subjective data.

■ the **examination** provides observations made by the nurse, the objective data.

The nursing history and examination will:

■ Organize patient reports and nurse observation into interview and examination, the two sources of information that influence clinical judgment.

- Identify actual or potential problems and strengths.
- Begin to establish a therapeutic relationship.

Methods of Data Collection

1. ***Observation***: is a conscious, deliberate skill that is developed only through effort and with an organized approach.To observe is to gather data by using the five senses. Although nurses observe mainly through sight, all of the senses are engaged during observation.

Observation has two aspects.

A/ Noticing the stimuli, and

B/ Selecting, organizing, and interpreting the data.

For example, a nurse who observes that a client's face is flushed must relate that observation to, for example, body temperatures, activity, environment temperature, and blood pressure.

2. Interviewing

The interview is a process in which understanding of a situation is gained through the collection of information from the individual who is then helped to make decisions about his health status. The interview should be conducted skillfully, with an atmosphere of support in which rapport between nurse and the patient facilitates self-exploration. The amount of self-exploration depends on the purpose of the interview. These types of interviewing illustrate different purposes.

A. Structured Interview: this is conducted to obtain specific information and it is seen as appropriate in crisis. All questions are decided in advance, in accordance with the specific information to be gained. The nurse controls the space the of interview.

B. Semi-Structured Interview: In this interview only some questions are decided in advance. This is used not only to gain specific information but also to explore feeling or to promote patient's participation.

C. Unstructured Interview: This can be valuable to explore patient' feeling. In this type, questions are not determined in advance, but allows to arise during the interview.

Some possible purposes are to:

- Gather data.
- Give information.
- Identify problems of mutual concern.
- Provide support, and
- To provide counseling or therapy.

Steps of Interview

The essential steps of interview are:

1. Set the stage: the interview begins by attending to the setting factors (The furniture, the lighting, and the environment), by putting the patient at ease and offering openings to begin the conversation. The nurse facilitates the process by being empathetic, warm, encouraging and respectful.

2. Build on the work started: Questioning can help the patient to explore the problem, to decide what the problem is, and to make decisions about acting on it.

3. Summarize of interview: at the end of interview or at a logical point on an interview, many effective nurse communicators find it useful to summarize what the client has said. Summarizing means verbally capturing the essence of what the client presented including pertinent facts, feelings, discrepancies, and untouched areas.

4. Closed interview: Nursing interviews frequently have time limits. There should time to review what has been discussed, to note what progress has been made, and to focus on finishing.

For example, asking the patient," Is there anything else you'd like to say today"? .this allows the patient to the choice of terminating the interview or not.

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Communicating Techniques

To elicit the information you need, you may use various communication techniques. For instance, you may ask open-ended questions, closed questions, and directive questions. You'll also use common language, silence, facilitation, confirmation, restatement, reflection, clarification, confrontation, interpretation, summary, and conclusion.

Open-ended questions

Open-ended questions—such as *"What brings you to the hospital today?"* or *"Can you tell me about your chest pain?"*—tend to elicit a good deal of information. So you should use them as much as possible. Unlike closed questions, open-ended ones give the patient a chance to provide descriptive answers at his own pace. As he does, you can evaluate his alertness and his mental abilities. However, open-ended questions also allow the patient to digress and avoid discussing relevant information. So you may need to gently refocus the patient's attention.

Closed-ended questions

If you need information quickly, use closed questions—such as *"Has your chest pain gone away?"* because they require only one- or two-word answers. Closed questions may also cause less anxiety for patients with poor verbal skills. However, when you use these questions, you may get only a limited amount of information and may convey to the patient that you aren't interested in his plight.

Directive questions

You can help the patient focus on one subject by asking him questions, such as *"When I press here, does it hurt?"* and *"How painful is this?"* You'll use such questions when you need specific information. But you should use them cautiously because they may make the patient feel rushed, and he may not share in-formation or fully develop his thoughts.

Common language

To promote clear communication, be sure to use language that the patient understands. Avoid using jargon and difficult clinical terms that create a barrier between you. If the patient uses words you don't understand, ask him to tell you what he means.

Communicating effectively

- Encourage a dialogue
- Watch for nonverbal gestures
- Be aware of your own body language
- Overcome emotional and cultural barriers

Health History

Content of the Health History

When a patient is seen for the first time by a member of the health care team, the first requirement is that baseline information be obtained (except in emergency situations). The sequence and format of obtaining data about a patient may vary, but the content, regardless of format, usually addresses the same general topics. A traditional approach includes the following:

- Biographical data
- Chief complaint
- Present health concern (or present illness)
- Past history
- Family history
- Review of systems
- Patient profile

Biographical Data

Biographical information puts the patient's health history into context. This information includes the person's name, address, age, gender, marital status, occupation, and ethnic origins.

Chief Complaint

The chief complaint is the issue that brings a person to the attention of the health care provider. Questions such as, *"Why have you come to the health center today?"* or *"Why were you admitted to the hospital?"* usually elicit the chief complaint. In the home setting, the initial question might be, *"What is bothering you most today?"* When a problem is identified, the person's exact words are usually recorded in quotation marks

Present Health Concern or Illness

The history of the present health concern or illness is the single most important factor in helping the health care team arrive at a diagnosis or determine the patient's needs. The physical examination is helpful but often only validates the information obtained from the history. A careful history assists in correct selection of appropriate diagnostic tests. Although diagnostic test results can be helpful, they often support rather than establish the diagnosis.

Past Health History

A detailed summary of a person's past health is an important part of the health history. After determining the general health status, the interviewer should inquire about immunization status according to the recommendations of the adult immunization schedule and record the dates of immunization (if known).

Dates of illness, or the age of the patient at the time, as well as the names of the primary health care provider and hospital, the diagnosis, and the treatment are noted.

The interviewer elicits a history of the following areas:

Childhood illnesses—,rubella, polio, whooping cough, mumps, measles, chickenpox, scarlet fever, rheumatic fever, strep throat

Adult illnesses

Psychiatric illnesses

Injuries—burns, fractures, head injuries

Hospitalizations

Surgical and diagnostic procedures

Current medications—prescription, over-the-counter (OTC), home remedies, complementary therapies

Use of alcohol and other drugs

Family History

To identify diseases that may be genetic, communicable, or possibly environmental in origin, the interviewer asks about the age and health status, or the age and cause of death, of first-order relatives (parents, siblings, spouse, children) and second-order relatives (grandparents, cousins). In general, it is necessary to include the following diseases: cancer, hypertension, heart disease, diabetes, epilepsy, mental illness, tuberculosis, kidney disease, arthritis, allergies, asthma, alcoholism, and obesity. One of the easiest methods of recording such data is by using the family tree or genogram.

Psychosocial history

The psychosocial history of the client describes the client's home and neighborhood conditions, client's financial status, client's occupational history, how the illness effect work/study, family and friends of the patient , and who support him.

Activities of Daily Living

ADL

Ask the patient about his diet, sleep patterns, exercise patterns, and use of alcohol, drugs, and tobacco.

- Feeding
- Grooming
- Bathing
- General mobility
- Toileting
- Cooking
- Bed mobility
- Home maintenance
- Dressing**,** and
- Shopping

Review of Systems

The review of systems includes an overview of general health as well as symptoms related to each body system. Questions are asked about each of the major body systems in terms of past or present symptoms.

Functional Assessment

Functional assessment includes

- Independency level,
- Requires use of equipment or device.
- Requires assistance or supervision of another person and equipment or device.
- Dependent and does not participate.

Patient Profile

In the patient profile, more biographical information is gathered. A complete composite, or profile, of the patient is critical to analysis of the chief complaint and of the person's ability to deal with the problem.

A general patient profile consists of the following content areas:

- Past life events related to health
- Education and occupation
- Environment (physical, spiritual, cultural, interpersonal)
- Lifestyle (patterns and habits)
- Presence of a physical or mental disability
- Self-concept
- Sexuality
- Risk for abuse
- Stress and coping response

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Functional Health Patterns

The (11) functional health patterns for use with individuals, families, and communities are:

1. **Health perception–health management pattern**: Describes perceived pattern of health and well-being and how health is managed.
2. **Nutritional-metabolic pattern**: Describes the pattern of food and fluid consumption relative to metabolic need. Also included are pattern indicators of local nutrient supply.
3. **Elimination pattern**: Describes patterns of excretory function, including bowel, bladder, and skin excretory functions.
4. **Activity-exercise pattern**: Describes patterns of exercise and daily activities.
5. **Sleep-rest pattern**: Describes patterns of sleep, rest, and relaxation.
6. **Cognitive-perceptual pattern**: Describes patterns of perception and cognition.
7. **Self-perception–self-concept pattern**: Describes self-concept and perception of self-worth, self-competency, body image, and mood state.
8. **Role-relationship pattern**: Describes pattern of role engagements and relationships.
9. **Sexuality-reproductive pattern**: Describes pattern of reproduction and of satisfaction or dissatisfaction with sexuality.
10. **Coping–stress tolerance pattern**: Describes pattern of coping and effectiveness of the pattern in terms of stress tolerance.
11. **Value-belief pattern**: Describes pattern of values, beliefs (including spiritual beliefs), and goals that guide choices and decisions.

The above sequence of patterns provides an order for successful assessment.

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Health Assessment

Of the Central Nervous System

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Assessment of the Central Nervous System

Assessment Objectives

- Perform a neurological assessment, including mental status, cranial nerves, sensory function, motor strength, cerebellar function, and reflexes
- Modify assessment techniques to reflect variations across the life span
- Document actions and observations
- Recognize and report significant deviations from norms

If the person has any of the following complaints:

- Headaches
- Blurry vision
- Change in behavior
- Fatigue
- Change in balance or coordination
- Numbness or tingling in the arms or legs
- Decrease in movement of the arms or legs
- Injury to the head, neck, or back
- Fever
- Seizures
- Slurred speech
- Weakness
- Tremor

Medical History (Specific to Central Nervous System)

- Seizures
- Head trauma
- Metabolic disorders (e.g. diabetes mellitus, thyroid problems)
- Cardiac disorders (e.g. hypertension, heart block)
- Transient ischemic attack
- Demyelinating disorders (e.g. multiple sclerosis, Parkinson's disease)
- Alcoholism

- Migraine headaches
- Psychiatric disorders (e.g. depression, bipolar disorder)
- Bell's palsy

Family History (Specific to Central Nervous System)

- Seizures
- Metabolic disorders (e.g. diabetes mellitus)
- Cardiac disorders (e.g. hypertension, myocardial infarction, stroke)
- Demyelinating disorders (e.g. multiple sclerosis, Parkinson's disease)
- Headaches (including types)
- Psychiatric disorders

Personal and Social History (Specific to Central Nervous System)

- Alcoholism and/or drug abuse
- Occupational exposure to neurotoxins

History of Present Illness and Review of System

The General following characteristics of each symptom should be elicited and explored:

- Onset (sudden or gradual)
- Chronology
- Current situation (improving or deteriorating)
- Location
- Radiation
- Quality
- Timing (frequency, duration)
- Severity
- Precipitating and aggravating factors
- Relieving factors
- Associated symptoms
- Effects on daily activities
- Previous diagnosis of similar episodes
- Previous treatments
- Efficacy of previous treatments

Cardinal Symptoms In addition to the general characteristics outlined above, additional characteristics of specific symptoms should be elicited, as follows

- General Cerebral Function
- Changes in memory, especially recent
- Changes in concentration
- Changes in mood Cranial Nerve Function
- Changes in vision, drooping eyelids
- Facial weakness
- Disturbance of speech production
- Hearing loss, unusual noise in ears, difficulties with balance
- Impairment of sense of smell or taste

Headaches

- Onset, age at onset
- Pattern, any changes in pattern, how it progresses
- Location, description, whether pulsating, degree of pain
- Time of day, duration, frequency
- Precipitating factors, aggravating factors
- Associated symptoms: nausea, vomiting, visual or sensory disturbances
- Interference with daily activities

Changes in Level of Consciousness

- Dizziness
- Fainting
- Convulsions
- History of head injury that produced any loss of consciousness

Motor Function

- Muscle weakness, paralysis, stiffness, spasm
- Clumsiness, ataxia

- Staggering gait with wide-base stance
- Tremor

Sensory Function

- Loss of or decrease in sensation
- Sensation of "pins and needles," tingling
- Burning sensation

Other Associated Symptoms

- Bowel or bladder dysfunction
- Impotence
- Pain

Examination of the Central Nervous System

General Appearance

- Apparent state of health
- Appearance of comfort or distress
- Color (e.g. flushed, pale, cyanotic)
- Nutritional status (emaciated or obese)
- Match between appearance and stated age

Assessed During History-Taking

- Level of consciousness
- Mental status
- Speech (clarity, content, volume, rate)

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Screening Examination

The following screening examination will reveal areas of difficulties. If deficits are discovered, a more in-depth examination is required.

	Cranial Nerve	Test
I	***Olfactory***	Smell (test only if there is a specific complaint)
II	***Optic***	Visual acuity, visual fields, funduscopic examination
III **IV** **VI**	***Trochlear*** ***Oculomotor*** ***Abdu cent***	Pupillary response (direct or consensual) Extraocular eye movements
V	***Trigeminal***	Motor function: clench teeth, open jaw. Sensory function: pain (sharp stimulus); light touch (cotton wisp); sensation on forehead, cheek, chin. Corneal reflex (omit if client is conscious)
VII	***Facial***	Facial symmetry; raise eyebrows, frown, close eyes tightly against resistance, show teeth, puff cheeks, smile
VIII	***Acoustic (Vestibulocochlear)***	Hearing (watch ticking, whisper), Rinne and Weber tests
IX	***Glossopharyngeal***	Movement of palate, uvula, pharyngeal wall. Gag reflex and swallowing.
X	***vagus***	Hoarseness
XI	***Spinal accessory***	Shoulder shrug against resistance. Head turn against resistance
XII	***Hypoglossal***	Stick out tongue, push tongue against each cheek

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Glasgow Coma Score

Glasgow Coma Score		
Eye Opening (E)	**Verbal Response (V)**	**Motor Response (M)**
4=Spontaneous 3=To voice 2=To pain 1=None	5=Normal conversation 4=Disoriented conversation 3=Words, but not coherent 2=No words...only sounds 1=None	6=Normal 5=Localizes to pain 4=Withdraws to pain 3=Decorticate posture 2=Decerebrate 1=None
		Total = E+V+M

Note : *that the phrase 'GCS of 11' is essentially meaningless, and it is important to break the figure down into its components, such as E3V3M5 = GCS 11.*

A Coma Score of 13 or higher correlates with a mild brain injury, 9 to 12 is a moderate injury and 8 or less a severe brain injury.

Arms and Hands

- Grip strength
- Raise both arms and hold (assess for palmar drift)
- Finger-nose test (assess for eye-hand coordination)
- Blunt and sharp pin prick
- Reflexes (biceps, triceps, brachioradialis [supinator])

Legs

- Straight-leg raising
- Bowstring test
- Quadriceps test
- Heel-to-toe walk
- Heel-shin test
- Romberg test
- Blunt and sharp pin prick
- Reflexes (Achilles' tendon, patellar, plantar)

Shock :

1. Shock is an acute, widespread process of impaired tissue perfusion that occurs when an imbalance develops between cellular oxygen supply and cellular oxygen demand.
2. Shock can be classified as hypovolemic, cardiogenic, or distributive (anaphylactic, neurogenic, and septic), depending on the pathophysiologic cause and hemodynamic profile.
3. Shock evolves through four stages: initial, compensatory, progressive, and refractory.
4. The patient with a MAP less than 60 mm Hg or with evidence of global tissue hypoperfusion is considered to be in a shock state.
5. Management of the patient in shock focuses on supporting oxygen delivery.
6. Prevention of shock is one of the primary responsibilities of the nurse in the critical care area.

Hypovolemic Shock:

Hypovolemic shock results from a loss of circulating or intravascular volume due to an absolute or relative fluid loss.

- Initial hemodynamic parameters include :
    1. Decreased CO or CI,
    2. Decreased CVP or PAOP
    3. Increased SVR

- <u>Medical management :</u>

    1. Focuses on identifying and stopping the source of fluid loss
    2. Administering fluid to replace circulating volume.

- <u>Nursing interventions include:</u>
    1. minimizing fluid loss.
    2. administering volume replacement.

3. assessing response to therapy.
4. providing comfort and emotional support.
5. preventing and maintaining surveillance for complications.

Cardiogenic Shock

Cardiogenic shock results from the impaired ability of the heart to pump due to problems affecting the muscular or mechanical function of the heart or dysrhythmias.

- Initial hemodynamic parameters include .
    1. Decreased CO or CI.
    2. Increased PAOP or CVP (or both).
    3. Increased SVR.
- Medical management.
    1. Focuses on identifying the etiologic factors of pump failure .
    2. Administering pharmacologic agents to enhance CO.
- Nursing interventions include:
    1. limiting myocardial oxygen demand.
    2. enhancing myocardial oxygen supply.
    3. maintaining tissue perfusion.
    4. providing comfort and emotional support.
    5. preventing and maintaining surveillance for complications.

Anaphylactic Shock

- Anaphylactic shock results from an immunologic antibody– antigen activation or nonimmunologic activation of mast cells and basophils and the release of biochemical mediators.
- Hemodynamic parameters include .
    1. Decreased CO or CI.
    2. Decreased RAP or PAOP.
    3. Decreased SVR.

- Medical management
    1. Focuses on removing the offending antigen.
    2. Reversing the effects of the biochemical mediators.
    3. Promoting adequate tissue perfusion.
- Nursing interventions include
    1. Administering epinephrine.
    2. Facilitating ventilation.
    3. Administering volume replacement.
    4. providing comfort and emotional support.
    5. preventing and maintaining surveillance for recurrent reactions and complications.

Neurogenic Shock

- Neurogenic shock results from the loss of sympathetic tone due to interrupted impulse transmission or blockage of sympathetic outflow from the vasomotor center in the brain.
- Hemodynamic parameters include:
    1. Decreased CO or CI.
    2. Decreased RAP or PAOP.
    3. Decreased SVR.
    4. Decreased heart rate.
- Medical management:
    1. Focuses on preventing cardiovascular stability
    2. Promoting tissue perfusion.
- Nursing interventions include:
    1. treating hypovolemia and maintaining tissue perfusion.
    2. maintaining normothermia.
    3. monitoring for and treating dysrhythmias.
    4. promoting comfort and emotional support.
    5. preventing and maintaining surveillance for complications.

Septic Shock

- Septic shock results from the initiation of the systemic inflammatory response due to microorganisms entering the body.
- Hemodynamic parameters include
    1. decreased CO or CI.
    2. decreased RAP or PAOP.
    3. decreased SVR.
    4. increased heart rate.
- Medical management
    1. Focuses on reversing the pathophysiologic responses.
    2. Controlling the infection.
    3. Promoting metabolic support.
- Nursing interventions include:
    1. early identification of the sepsis syndrome.
    2. administering prescribed fluids, medications, and nutrition.
    3. promoting comfort and emotional support.
    4. preventing and maintaining surveillance for complications.

Systemic Inflammatory Response

1. The systemic inflammatory response is an intense host response characterized by generalized inflammation in organs remote from the initial insult.
2. Consequences include uncontrolled activation of inflammatory cells, damage of vascular endothelium, disruption of immune cell function, hyper metabolism, and maldistribution of circulatory volume.

Multiple Organ Dysfunction Syndrome

- MODS results from progressive physiologic failure of two or more separate organ systems.
- Organ dysfunction is influenced by numerous factors, including organ host defense function, response time to the injury, metabolic requirements, organ vasculature response to vasoactive medications, and organ sensitivity to damage and physiologic reserve.
- Collaborative management:
    1. focuses on fluid resuscitation and hemodynamic support.
    2. prevention and treatment of infection.
    3. maintenance of tissue oxygenation.
    4. nutritional and metabolic support.
    5. comfort and emotional support.
    6. preservation of individual organ function.

MAP: mean arterial blood pressure.

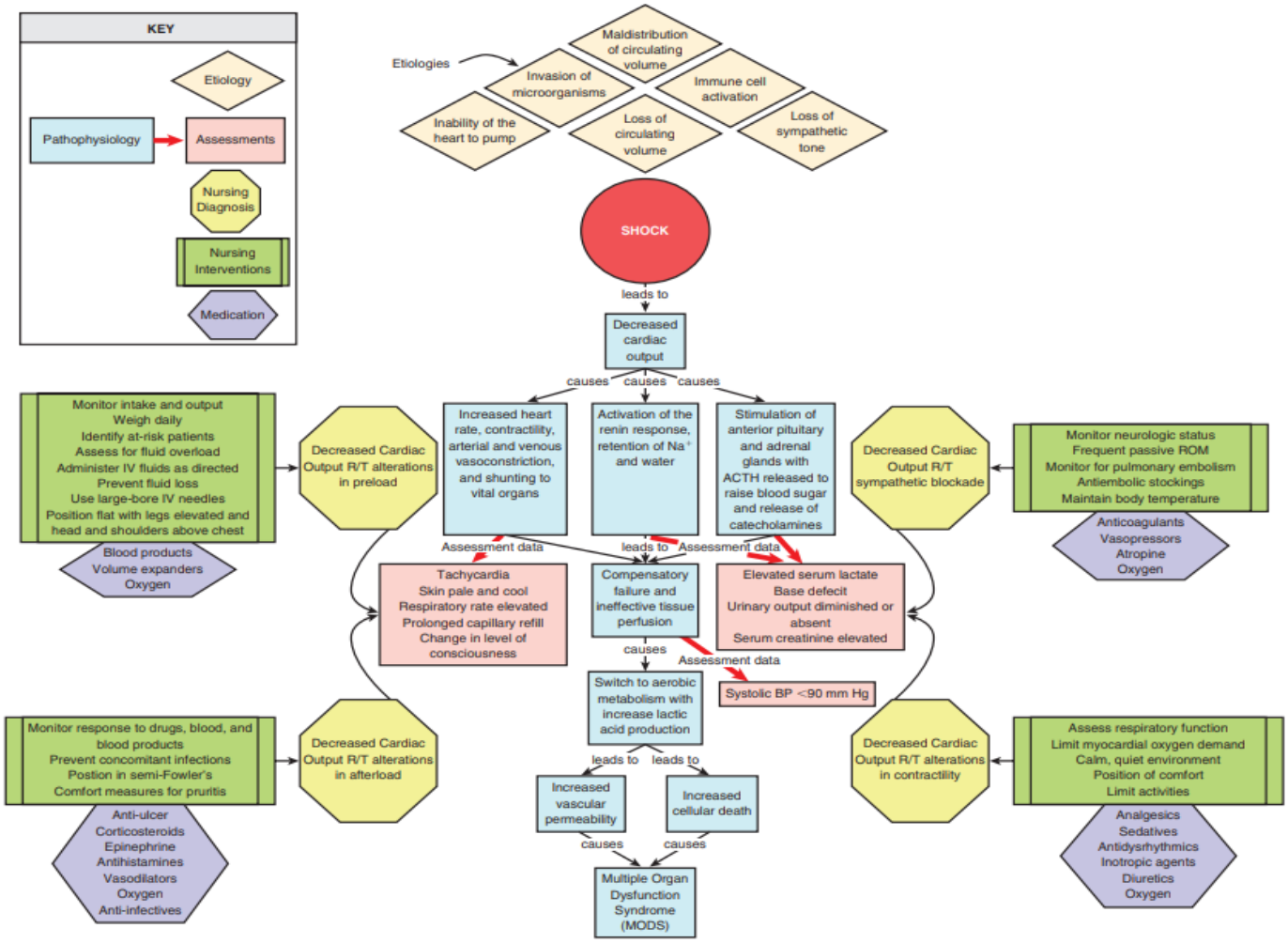
CI : cardiac index .

CVP: central venous pressure.

PAOP: pulmonary artery occlusion pressure.

RAP: right atrial pressure.

SVR: systemic venous resistance.



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Arterial Blood Gas (ABG

This determines the patient's ventilation, tissue oxygenation and acid-base status. Three to five milliliters of blood is obtained from an artery. Usually the radial, brachial or femoral arteries are used.

The abnormal results are:

- Increased pH shows metabolic alkalosis or respiratory alkalosis.
- Decreased pH shows metabolic acidosis or respiratory acidosis.
- Increased pCO2 indicates COPD.
- Decreased pCO2 indicates hypoxemia
- Increased HCO3 indicates dehydration, COPD.
- Decreased HCO3 indicates fluid loss.
- Increased pO2 shows hyperventilation.
- Decreased pO2 shows anemia, respiratory difficulties.

WHAT TO DO? Before the test:

- Explain to the patient that arterial sticks may be more uncomfortable .
- Provide the lab with information on whether or not the patient is receiving supplemental or mechanical ventilation as well as on the amount of oxygen received or the setting of the ventilator as it may alter the results.

After the test:

- ✓ Apply mechanical pressure to puncture site for 5 minutes.
- ✓ Apply pressure dressing to puncture site for 30 minutes once bleeding has stopped.
- ✓ Monitor the puncture site for bleeding.

Respiratory acidosis:

- Hypoventilation, asphyxia, or central nervous system disorders cause a disturbance in the acid-base balance of the patient’s blood, resulting in increased carbon dioxide in the blood (hypercapnia)

PROGNOSIS:

- Respiratory acidosis may be due to an acute or chronic respiratory condition. Respiratory failure results in severe acidosis.

SIGNS AND SYMPTOMS:

- Hypoxemia.
- Cardiac arrhythmia or tachycardia due to hypoxemia from hypoventilation.
- BP changes depending on underlying cause
- Headache due to hypoxemia
- Difficulty breathing (dyspnea) due to hypoxemia
- Confusion and restlessness due to hypoxemia
- Irritability due to hypoxemia .

NTERPRETING TEST RESULTS :

- Carbon dioxide (CO_2) >50 mmHg shown in arterial blood gas .
- pH of blood <7.35 shows acidosis in arterial blood gas

TREATMENT:

- Treatment is focused on restoring appropriate ventilation, returning carbon dioxide levels to normal, and returning pH levels to normal.
- Give supplemental oxygen, monitoring flow rate to avoid excess oxygen to those who have chronic pulmonary conditions.

- Administer bronchodilators to open constricted airways:

albuterol, metaproterenol, levalbuterol

- Administer medications as necessary to correct underlying disorder.
- Administer antibiotics as ordered as a result of the sensitivity test.
- Mechanical ventilation if necessary to support breathing.
- Treat underlying cause.

NURSING DIAGNOSES :

- Ineffective breathing .
- Fear .
- Impaired gas exchange

NURSING INTERVENTION :

- Monitor respiration for rate, effort, use of accessory muscles, skin color, mucous production, and breath sounds.
- Monitor blood chemistry—potassium, CO_2 , chloride
- Explain to the patient:
- How to administer oxygen therapy.
- How to perform turning, coughing, and deep-breathing exercises

Metabolic acidosis :

- The acid-base balance of the blood is thrown off, causing it to become more acidic. There is an arterial pH of less than 7.35. There may be an overproduction of hydrogen ions (lactic acidosis in fever or seizures, diabetic ketoacidosis, starvation, alcohol or aspirin intake), deficient elimination of hydrogen ions (renal failure), deficient production of bicarbonate ions (renal failure, pancreatic insufficiency), or excess elimination of bicarbonate ions (diarrhea).

PROGNOSIS

- Correction or management of the underlying cause is necessary to help restore the acid-base balance

SIGNS AND SYMPTOMS

- Lethargy due to increased hydrogen ion concentration in blood •
- Muscle weakness bilaterally due to neuromuscular manifestations
- Tachycardia early in acidosis; later, cardiac electrical conduction slows, causing bradycardia and increasing risk for heart block or arrhythmia •
- Hypotension due to vasodilation •
- Rapid, deep breathing (hyperventilation) as body attempts to compensate

INTERPRETING TEST RESULTS

- Arterial blood gas showing pH < 7.35 and bicarbonate < 22 mEq/L, normal PaCO2 . • Ketones in urine possible.
- Potassium level elevated
- Chloride level normal or elevated.

TREATMENT :

- Administer intravenous fluids for hydration as necessary.
- Monitor arterial blood gas levels.
- Administer supplemental oxygen as necessary.
- Administer bicarbonate if bicarbonate levels are low.
- Correct the underlying condition that is causing the imbalance.
- Administer insulin and fluids in diabetic ketoacidosis.
- Mechanical ventilation if necessary.
- Hemodialysis if necessary to restore normal balance in system.

NURSING DIAGNOSES :

- Disturbed thought processes .
- Ineffective breathing pattern

NURSING INTERVENTION :

- Monitor intake and output.
- Monitor vital signs for changes
- Monitor lab test results.
- Monitor ABG results.

Metabolic Alkalosis :

- The acid-base balance of the blood is basic because of either a decrease in acidity or an increase in bicarbonate. Alkalosis is often associated with decreased levels of potassium or calcium. Metabolic alkalosis may be due to excess intake of antacids, blood transfusions, long-term parenteral nutrition, prolonged vomiting or nasogastric suctioning, Cushing's disease, use of thiazide diuretics, or excess aldosterone.

PROGNOSIS

- Correction or management of the underlying cause is necessary to help restore the acid-base balance.

SIGNS AND SYMPTOMS

- Muscle weakness due to neuromuscular changes and hypokalemia •
- Muscle cramping and twitching due to electrolyte changes •
- Anxiety and irritability •
- Tetany and seizures, as alkalosis worsens •
- Positive Chvostek's sign due to hypocalcemia •
- Positive Trousseau's sign due to hypocalcemia •
- Increased reflexes due to neuromuscular irritability •
- Increased heart rate and myocardial irritability

INTERPRETING TEST RESULTS :

- Arterial blood gas showing pH > 7.45, bicarbonate > 28 mEq/L, pCO2 elevated. •
- Serum potassium low, chloride low.

TREATMENT

- Monitor arterial blood gases and electrolyte levels.
- Administer fluids and electrolytes as necessary.
- Administer supplemental oxygen if necessary.
- Administer electrolyte replacement as indicated

NURSING DIAGNOSES :

- Risk for injury •
- Disturbed thought process.

NURSING INTERVENTION

- Monitor vital signs for changes.
- Monitor cardiovascular status for changes in heart rate, rhythm.
- Monitor intake and output.
- Assess intravenous site for signs of infiltration.
- Check neurological status for changes.

Pulmonary embolism:

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Pulmonary embolism:

- Blood flow is obstructed in the lungs caused by thrombus (blood clot), air, or fat emboli that become stuck in an artery, causing impaired gas exchange.

PROGNOSIS:

- A small area of atelectasis will allow for resolution and return to normal function of the rest of the lung tissue. A large embolus at or near the main pulmonary artery may be fatal. Patients may need to take ongoing anticoagulants if they have repeat episodes or emboli or have an underlying clotting disorder.

SIGNS AND SYMPTOMS:

1. Sudden difficulty breathing (dyspnea) •
2. Heart rate greater than 100 beats per minute (tachycardia) •
3. Respiration greater than 20 breaths per minutes (tachypnea) •
4. Chest pain due to clot presence •
5. Coughing with blood-tinged sputum (hemoptysis) •
6. Crackles (rales) heard near area of clot

INTERPRETING TEST RESULTS :

1. Chest x-ray may show dilated pulmonary artery or pleural effusion.
2. Lung scan shows ventilation-perfusion mismatch. •
3. CT scan will show clot in pulmonary arteries. •
4. Pulmonary angiography will show presence of clot. •
5. Arterial blood gases may show decreased oxygen and carbon dioxide), depending on the size of the clot. •
6. D-dimer will be positive when a thromboembolic event has occurred. •
7. Lower extremity ultrasound is often done to test for presence of thrombus.

TREATMENT

1. Supplemental oxygen therapy. •
2. Administer thrombolytics to enhance breakdown of existing clot :
3. Administer anticoagulants to prevent further clot formation: heparin, warfarin •
4. Administer analgesic for pain control and to decrease myocardial oxygen demand: morphine •
5. Surgical insertion of a vena cava filter in select patients to catch clots that travel from lower extremities up through inferior vena cava toward lung. •
6. Bed rest to prevent thrombus from breaking free from lower extremities. •
7. Surgical removal of the embolus may be necessary in some cases

Pleural effusion:

- Abnormal accumulation of fluid within the pleural space between the parietal and visceral pleura covering the lungs. The fluid may be serous fluid, blood (hemothorax), or pus (empyema). Fluid builds up when the development of the fluid exceeds the body's ability to remove the fluid.

Causes

- Causes of pleural effusion are varied and include congestive heart failure, renal failure, malignancy, pulmonary infarction, infection, or trauma. It can also occur as a postoperative complication.

SIGNS AND SYMPTOMS :

1. Chest pain due to presence of inflammation of the pleura in the area; not always present.
2. Difficulty breathing (dyspnea) due to diminished chest expansion in the area.
3. Decreased breath sounds on auscultation over the area due to presence of fluid. •
4. Dullness on percussion over the affected area due to the presence of fluid. •
5. Fever due to infection with empyema. •
6. Increased pulse and respirations.
7. decreased BP due to blood loss with hemothorax. •
8. Low oxygen saturation on pulse oximeter.

INTERPRETING TEST RESULTS :

1. Chest x-ray shows pleural effusion. •
2. Chest CT scan shows pleural effusion. •
3. Chest ultrasound shows pleural effusion. •
4. Thoracentesis (removal of fluid with a needle from the pleural space) shows type of fluid.

TREATMENT

- Fluid removal is performed either as a one-time procedure or with a chest tube, to continuously allow for drainage of the fluid until the tube is removed.

1. Supplemental oxygen may be needed to help meet the body's needs.
2. Thoracentesis to remove the fluid.
3. Chest tube to remove larger amounts of drainage over time.
4. Oxygen as needed.
5. Administer antibiotics for empyema.
6. Selected according to results of culture and sensitivity study

NURSING DIAGNOSES :

1. Impaired gas exchange •
2. Risk for infection •
3. Pain

NURSING INTERVENTION :

1. Administer supplemental oxygen therapy to help meet body's needs. •
2. Monitor for changes in vital signs. •
3. Have the patient perform turning, coughing, deep-breathing exercises to enhance lung expansion. •
4. Monitor chest tube drainage for color, amount, and changes in drainage. •
5. Assure patency of chest tube to make sure the tube is draining properly.

Hemothorax :

- In hemothorax, blood collects in the pleural layer, compressing the lung on the affected side; this lung compression compromises gas exchange

Signs and symptoms :

1. Chest pain.
2. Cyanosis.
3. Dyspnea.
4. tachypnea commonly occur .
5. blood loss.
6. hypertension .
7. shock may occur .
8. Asymmetrical lung expansion is accompanied by decreased breath sounds on the affected side .

Diagnosis and treatment :

1. Chest X-ray.
2. CBC.
3. ABG studies are commonly prescribed .
4. A chest tube is inserted.
5. a water seal or suction is used to facilitate drainage .
6. Thoracotomy may be indicated if blood loss .
7. the patient is treated with I.V. fluids and transfusion

Nursing interventions :

1. Administer oxygen to maintain adequate oxygenation, improve and reverse hypoxemia .
2. Teach techniques for effective coughing and deep breathing
3. Maintain the integrity of the chest tube system to facilitate blood drainage from around the lung and promote lung expansion .
4. Check the chest tube insertion site for crepitus, which indicates air leakage into tissue and may indicate a leak in the chest tube system
5. Encourage frequent position changes to prevent complications of immobility and promote lung expansion.
6. Provide an analgesic as needed to reduce anxiety, relieve pain, and ease coughing and deep breathing .

Pneumothorax:

- The pleural sac surrounding the lung normally contains a small amount of fluid to prevent friction as the lungs expand and relax during the respiratory cycle. When air is allowed to enter the pleural space between the lung and the chest wall.

SIGNS AND SYMPTOMS :

1. Sharp chest pain, made worse by activity, moving, coughing, and breathing •
2. Shortness of breath due to inability to fully expand the lungs during inspiration •
3. Absent breath sounds over the affected area due to presence of air between lungs and chest wall •
4. Subcutaneous emphysema (presence of air in the tissue beneath the skin)— a crackling feeling beneath the skin on palpation over the area •
5. Tachycardia (increased heart rate) and tachypnea (increased respiratory rate) as body attempts to meet needs
6. Mediastinal shift and tracheal deviation toward the unaffected side with tension pneumothorax .

INTERPRETING TEST RESULTS :

1. Shadows on chest x-ray, indicating a collapsed lung. •
2. Increased carbon dioxide shown in arterial blood gas. •
3. Low oxygen saturation on pulse oximetry.

TREATMENT:

1. Bed rest. •
2. Supplemental oxygen if needed. •
3. Chest tube connected to suction to re-expand lung if needed. •
4. Administer analgesic if needed: •
5. morphine

NURSING DIAGNOSES :

1. Acute pain •
2. Ineffective breathing •
3. Impaired gas exchange.

NURSING INTERVENTION :

1. Place patient in high Fowler's or semi-Fowler's position .
2. Monitor drainage of the chest tube for amount and characteristics of output.
3. Monitor vital signs for changes.
4. Monitor respirations for rate, effort, use of accessory muscles, skin color, and breath sounds. •
5. Teach turning, coughing, and deep-breathing exercises. •
6. Explain to the patient: • Disease process,

Importance of coughing and deep breathing.

Thanks for attention

Arterial Blood Gas (ABG

This determines the patient's ventilation, tissue oxygenation and acid-base status. Three to five milliliters of blood is obtained from an artery. Usually the radial, brachial or femoral arteries are used. The abnormal results are:

1. Increased pH shows metabolic alkalosis or respiratory alkalosis.
2. Decreased pH shows metabolic acidosis or respiratory acidosis. Increased pCO2 indicates COPD.
3. Decreased pCO2 indicates hypoxemia
4. Increased HCO3 indicates dehydration, COPD.
5. Decreased HCO3 indicates fluid loss.
6. Increased pO2 shows hyperventilation.
7. Decreased pO2 shows anemia, respiratory difficulties.

WHAT TO DO? Before the test:

1. Explain to the patient that arterial sticks may be more uncomfortable than venous lab work performed by the phlebotomists.
2. Provide the lab with information on whether or not the patient is receiving supplemental or mechanical ventilation as well as on the amount of oxygen received or the setting of the ventilator as it may alter the results. After the test:

a) Apply mechanical pressure to puncture site for 5 minutes.
b) Apply pressure dressing to puncture site for 30 minutes once bleeding has stopped.
c) Monitor the puncture site for bleeding.

Respiratory acidosis:

WHAT WENT WRONG?

Hypoventilation, asphyxia, or central nervous system disorders cause a disturbance in the acid-base balance of the patient's blood, resulting in increased carbon dioxide in the blood (hypercapnia). The increase in carbon dioxide in the blood combines with water; this combination releases hydrogen and bicarbonate ions.

The brain stem is stimulated and increases the respiratory drive to blow off carbon dioxide. Over time, the sustained elevated arterial carbon dioxide level causes the kidneys to attempt to compensate by retaining bicarbonate and sodium and excreting hydrogen ions.

PROGNOSIS:

Respiratory acidosis may be due to an acute or chronic respiratory condition. Respiratory failure results in severe acidosis. The more rapid onset of acidosis does not allow time for the kidneys to compensate. Healthy patients usually can increase the amount of CO2 that the lungs are getting rid of to assist in lowering the blood levels of CO2 . Patients with underlying respiratory disorders will not be able to rid the body of the excess CO2 in this way

SIGNS AND SYMPTOMS:

1. Hypoxemia.
2. Cardiac arrhythmia or tachycardia due to hypoxemia from hypoventilation.
3. BP changes depending on underlying cause
4. Headache due to hypoxemia
5. Difficulty breathing (dyspnea) due to hypoxemia
6. Confusion and restlessness due to hypoxemia
7. Irritability due to hypoxemia .

NTERPRETING TEST RESULTS :

1. Carbon dioxide (CO2) >50 mmHg shown in arterial blood gas .
2. pH of blood <7.35 shows acidosis in arterial blood gas

TREATMENT:

Treatment is focused on restoring appropriate ventilation, returning carbon dioxide levels to normal, and returning pH levels to normal.

1. Give supplemental oxygen, monitoring flow rate to avoid excess oxygen to those who have chronic pulmonary conditions. The chronic nature of the respiratory acidosis in these patients may have caused the internal respiratory control to adjust in response to a decrease in oxygen level rather

than an increase in carbon dioxide level, which is always higher than normal.

2. Administer bronchodilators to open constricted airways:
   albuterol, metaproterenol, levalbuterol
3. Administer medications as necessary to correct underlying disorder.
4. Administer antibiotics as ordered as a result of the sensitivity test.
5. Mechanical ventilation if necessary to support breathing.
6. Treat underlying cause.

NURSING DIAGNOSES :

1. Ineffective breathing .
2. Fear .
3. Impaired gas exchange.

NURSING INTERVENTION :

1. Monitor respiration for rate, effort, use of accessory muscles, skin color, mucous production, and breath sounds.
2. Monitor blood chemistry—potassium, CO2 , chloride
3. Explain to the patient:

a) How to administer oxygen therapy.
b) How to perform turning, coughing, and deep-breathing exercises

Metabolic acidosis:

The acid-base balance of the blood is thrown off, causing it to become more acidic. There is an arterial pH of less than 7.35. There may be an overproduction of hydrogen ions (lactic acidosis in fever or seizures, diabetic ketoacidosis, starvation, alcohol or aspirin intake), deficient elimination of hydrogen ions (renal failure), deficient production of bicarbonate ions (renal failure, pancreatic insufficiency), or excess elimination of bicarbonate ions (diarrhea).

PROGNOSIS ;

Correction or management of the underlying cause is necessary to help restore the acid-base balance

SIGNS AND SYMPTOMS:

1. Lethargy due to increased hydrogen ion concentration in blood •
2. Muscle weakness bilaterally due to neuromuscular manifestations Tachycardia early in acidosis; later, cardiac electrical conduction slows, causing bradycardia and increasing risk for heart block or arrhythmia •
3. Hypotension due to vasodilation •
4. Rapid, deep breathing (hyperventilation) as body attempts to compensate

INTERPRETING TEST RESULTS :

1. Arterial blood gas showing pH < 7.35 and bicarbonate < 22 mEq/L, normal PaCO2 . • Ketones in urine possible.
2. Potassium level elevated
3. Chloride level normal or elevated.

TREATMENT :

1. Administer intravenous fluids for hydration as necessary.
2. Monitor arterial blood gas levels.
3. Administer supplemental oxygen as necessary.
4. Administer bicarbonate if bicarbonate levels are low.
5. Correct the underlying condition that is causing the imbalance.
6. Administer insulin and fluids in diabetic ketoacidosis.
7. Mechanical ventilation if necessary.
8. Hemodialysis if necessary to restore normal balance in system or remove offending substance.

NURSING DIAGNOSES :

1. Disturbed thought processes .
2. Ineffective breathing pattern

NURSING INTERVENTION :

1. Monitor intake and output.
2. Monitor vital signs for changes.
3. Monitor lab test results.
4. Monitor ABG results.

Metabolic Alkalosis :

The acid-base balance of the blood is basic because of either a decrease in acidity or an increase in bicarbonate. Alkalosis is often associated with decreased levels of potassium or calcium. Metabolic alkalosis may be due to excess intake of antacids, blood transfusions, long-term parenteral nutrition, prolonged vomiting or nasogastric suctioning, Cushing's disease, use of thiazide diuretics, or excess aldosterone.

PROGNOSIS:

Correction or management of the underlying cause is necessary to help restore the acid-base balance.

SIGNS AND SYMPTOMS :

1. Muscle weakness due to neuromuscular changes and hypokalemia •
2. Muscle cramping and twitching due to electrolyte changes •
3. Anxiety and irritability •
4. Tetany and seizures, as alkalosis worsens •
5. Positive Chvostek's sign due to hypocalcemia •
6. Positive Trousseau's sign due to hypocalcemia •
7. Increased reflexes due to neuromuscular irritability •
8. Increased heart rate and myocardial irritability

INTERPRETING TEST RESULTS :

1. Arterial blood gas showing pH > 7.45, bicarbonate > 28 mEq/L, pCO2 elevated. •
2. Serum potassium low, chloride low.

TREATMENT :

1. Monitor arterial blood gases and electrolyte levels.
2. Administer fluids and electrolytes as necessary.
3. Administer supplemental oxygen if necessary.
4. Administer electrolyte replacement as indicated.

NURSING DIAGNOSES :

1. Risk for injury •
2. Disturbed thought process.

NURSING INTERVENTION :

1. Monitor vital signs for changes.
2. Monitor cardiovascular status for changes in heart rate, rhythm.
3. Monitor intake and output.
4. Assess intravenous site for signs of infiltration.
5. Check neurological status for changes.