

NURSING PRACTICAL 1

NSG 217



**University of Ibadan Distance Learning Centre
Open and Distance Learning Course Series Development**

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Vice-Chancellor's Message

The Distance Learning Centre is building on a solid tradition of over two decades of service in the provision of External Studies Programme and now Distance Learning Education in Nigeria and beyond. The Distance Learning mode to which we are committed is providing access to many deserving Nigerians in having access to higher education especially those who by the nature of their engagement do not have the luxury of full time education. Recently, it is contributing in no small measure to providing places for teeming Nigerian youths who for one reason or the other could not get admission into the conventional universities.

These course materials have been written by writers specially trained in ODL course delivery. The writers have made great efforts to provide up to date information, knowledge and skills in the different disciplines and ensure that the materials are user-friendly.

In addition to provision of course materials in print and e-format, a lot of Information Technology input has also gone into the deployment of course materials. Most of them can be downloaded from the DLC website and are available in audio format which you can also download into your mobile phones, IPod, MP3 among other devices to allow you listen to the audio study sessions. Some of the study session materials have been scripted and are being broadcast on the university's Diamond Radio FM 101.1, while others have been delivered and captured in audio-visual format in a classroom environment for use by our students. Detailed information on availability and access is available on the website. We will continue in our efforts to provide and review course materials for our courses.

However, for you to take advantage of these formats, you will need to improve on your I.T. skills and develop requisite distance learning Culture. It is well known that, for efficient and effective provision of Distance learning education, availability of appropriate and relevant course materials is a *sine qua non*. So also, is the availability of multiple plat form for the convenience of our students. It is in fulfilment of this, that series of course materials are being written to enable our students study at their own pace and convenience.

It is our hope that you will put these course materials to the best use.



Prof. Abel Idowu Olayinka

Vice-Chancellor

Foreword

As part of its vision of providing education for “Liberty and Development” for Nigerians and the International Community, the University of Ibadan, Distance Learning Centre has recently embarked on a vigorous repositioning agenda which aimed at embracing a holistic and all encompassing approach to the delivery of its Open Distance Learning (ODL) programmes. Thus we are committed to global best practices in distance learning provision. Apart from providing an efficient administrative and academic support for our students, we are committed to providing educational resource materials for the use of our students. We are convinced that, without an up-to-date, learner-friendly and distance learning compliant course materials, there cannot be any basis to lay claim to being a provider of distance learning education. Indeed, availability of appropriate course materials in multiple formats is the hub of any distance learning provision worldwide.

In view of the above, we are vigorously pursuing as a matter of priority, the provision of credible, learner-friendly and interactive course materials for all our courses. We commissioned the authoring of, and review of course materials to teams of experts and their outputs were subjected to rigorous peer review to ensure standard. The approach not only emphasizes cognitive knowledge, but also skills and humane values which are at the core of education, even in an ICT age.

The development of the materials which is on-going also had input from experienced editors and illustrators who have ensured that they are accurate, current and learner-friendly. They are specially written with distance learners in mind. This is very important because, distance learning involves non-residential students who can often feel isolated from the community of learners.

It is important to note that, for a distance learner to excel there is the need to source and read relevant materials apart from this course material. Therefore, adequate supplementary reading materials as well as other information sources are suggested in the course materials.

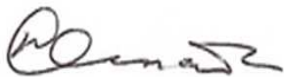
Apart from the responsibility for you to read this course material with others, you are also advised to seek assistance from your course facilitators especially academic advisors during your study even before the interactive session which is by design for revision. Your academic advisors will assist you using convenient technology including Google Hang Out, You Tube, Talk Fusion, etc. but you have to take advantage of these. It is also going to be of immense advantage if you complete assignments as at when due so as to have necessary feedbacks as a guide.

The implication of the above is that, a distance learner has a responsibility to develop requisite distance learning culture which includes diligent and disciplined self-study, seeking available administrative and academic support and acquisition of basic information technology skills. This is why you are encouraged to develop your computer skills by availing yourself the opportunity of training that the Centre’s provide and put these into use.

In conclusion, it is envisaged that the course materials would also be useful for the regular students of tertiary institutions in Nigeria who are faced with a dearth of high quality textbooks. We are therefore, delighted to present these titles to both our distance learning students and the university's regular students. We are confident that the materials will be an invaluable resource to all.

We would like to thank all our authors, reviewers and production staff for the high quality of work.

Best wishes.

A handwritten signature in black ink, appearing to read 'Bayo Okunade', written in a cursive style.

Professor Bayo Okunade

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Table of Contents

Content Authoring Ms Lucia Ojewale.....	6
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Study Session 1: Health assessment	12
Introduction.....	13
Learning Outcomes for Study Session 1.....	13
1.1 The Meaning and components of health assessment	13
1.1.2 Components of Health assessment.....	13
In-text Question	14
In-text Answer	14
1.2 The reasons/purpose for carrying out health assessment.....	15
1.2.1 Types of data in health assessment	15
1.3 Physical and psychological preparation of clients for health assessment	15
1.4 Assessment Techniques	17
In-text Question	19
In-text Answer	19
Summary of Study Session 1	20
Self-Assessment Questions (SAQs).....	21
SAQ 1.1.....	21
SAQ 1.2.....	21
SAQ 1.3.....	21
SAQ 1.4.....	21
Study Session 2: A Quick Head - To - Toe Assessment and General Survey.....	22
Introduction.....	22
Learning Outcomes for study session 2	22
2.1 General Survey.....	22
In-text Question	22
In-text Answer	22
2.2. Steps of head to toe and general survey assessment.....	24
2.3. System by system method of head to toe assessment.....	25
Summary of Study Session 2	25
Self-Assessment Questions (SAQs).....	26

SAQ 2.1.....	26
SAQ 2.2.....	26
SAQ 2.3.....	26
Study Session 3: Respiratory system assessment	27
Introduction.....	27
Learning Outcomes for study session 3	27
3.1 Overview of respiratory assessment	27
In-text Question	28
In-text Answer	28
3.2 Chest landmarks.....	28
In-text Question	29
In-text Answer	29
3.2.1 Position/Lighting/Draping	29
3.3 Chest wall deformities	30
In-text Question	32
In-text Answer	32
3.4: Practical Steps for Respiratory Assessment.....	32
Summary of Study Session 3	38
Self-Assessment Questions (SAQs).....	39
SAQ 3.1.....	39
SAQ 3.2.....	39
SAQ 3.3.....	39
SAQ 3.4.....	39
Study Session 4: Performing Postural Drainage.....	40
Introduction.....	40
Learning Outcomes for study session 4	40
4.1 Postural drainage.....	40
In-text Question	41
In-text Answer	42
4.2 Positions for Draining Different Areas of Lungs.....	42
4.3 Step-By-Step Technique of Postural Drainage	43
Summary of Study Session 4	45
Self-Assessment Questions (SAQs).....	46

SAQ 4.1.....	46
SAQ 4.2.....	46
SAQ 4.3.....	46
Study Session 5: Assisting the Patient with the use of an Incentive Spirometer	47
Introduction.....	47
Learning Outcomes	47
5.1 Incentive Spirometry.....	47
5.1.1 Who are the clients who needs incentive spirometry i.e Indications	47
In-text Question	47
In-text Answer	48
5.2 Types of incentive spirometer.....	48
In-text Question	48
In-text Answer	49
5.3 Step-By-Step Technique of Incentive Spirometry.....	49
Summary of study session 5	50
Self-Assessment Questions (SAQs).....	51
SAQ 5.1.....	51
SAQ 5.2.....	51
SAQ 5.3.....	51
Study Session 6: Performing Chest Physiotherapy.....	52
Introduction.....	52
Learning Outcomes for Study Session 6.....	52
6.1 chest physiotherapy.....	52
In-text Question	52
In-text Answer	52
6.1.1 The clients who cannot have a chest physiotherapy i.e. Contraindications includes:	53
6.2 The process of chest physiotherapy	53
In-text Question	54
In-text Answer	54
6.3 Step-By-Step Technique of Chest Physiotherapy.....	55
Special Considerations.....	57
Paediatric Variations.....	57
Summary of study session 6	57

Self-Assessment Questions (SAQs).....	58
SAQ 6.1.....	58
SAQ 6.2.....	58
SAQ 6.3.....	58
Study Session 7: Oxygenation I & II.....	59
Introduction.....	59
Learning Outcomes for Study session 7.....	59
7.1 Oxygenation.....	59
In-text Question.....	59
In-text Answer.....	59
7. 1.1 The Clients who will need Oxygen Therapy i.e. Indications.....	59
In-text Question.....	60
In-text Answer.....	60
7.2 Definition of Terminologies.....	60
7.3 The Various Methods of Oxygen Administration.....	60
In-text Question.....	63
In-text Answer.....	63
Summary of Study Session 7.....	69
Self-Assessment Questions (SAQs) for Study Session 7.....	69
SAQs 7.1 (tests learning outcomes 7.1).....	69
SAQs 7.2 (tests learning outcomes 7.2).....	69
SAQs 7.3 (tests learning outcomes 7.3).....	69
Notes ON SAQs.....	70
Study Session 8: OXYGENATION III.....	71
Introduction.....	71
Learning Outcome for Study Session 8.....	71
8.1 Administration of Oxygen by Tent.....	71
In-text Question.....	72
In-text Answer.....	72
8.2 Step-by-Step Technique of Oxygen Therapy via Tent.....	72
8.2.1 Special Considerations.....	73
Summary of Study Session 8.....	74
Self-Assessment Questions (SAQs) for Study Session 8.....	74

SAQs 8.1 (tests learning outcomes 8.1)	74
SAQs 8.2 (tests learning outcomes 8.2)	74
Notes on SAQs	74
Study Session 9: Pursed Lip Breathing, Coughing and Deep Breathing Exercises.....	76
Introduction.....	76
Learning Outcomes for Study Session 9	76
9.1 Why is Breathing Exercise Necessary i.e. Purpose	76
9.1.1 Breathing Exercises	76
9.2 The various types of breathing exercises.....	76
Summary of Study Session 9.....	78
Self-Assessment Questions (SAQs) for Study Session 9	78
SAQs 9.1 (tests learning outcomes 9.1)	78
Notes on SAQs	79
Study Session 10: Oral and Nasopharyngeal Suctioning	80
Introduction.....	80
Learning Outcomes for Study Session 10	80
10.1 Suctioning	80
In-text Question.....	80
In-text Answer	80
10.1.1 Types of suctioning	81
10.2 Importance of Suctioning.....	81
10.3 STEPS BY STEP TECHNIQUE.	81
Summary of Study Session 10.....	86
Self-Assessment Questions (SAQs) for Study Session 10	86
SAQs 10.1 (tests learning outcomes 10.1)	87
SAQs 10.2 (tests learning outcomes 10.2)	87
Notes on SAQs	87
Study Session 11: Using Bronchodilators	88
Introduction.....	88
Learning Outcomes for Study session 11.....	88
11.1 Bronchodilators.....	88
11.2 The types of Bronchodilators.....	88
11.3The methods of administering Bronchodilators	89

Summary of Study Session 11	91
Self-Assessment Questions (SAQs) for Study Session 11	91
SAQs 11.1 (tests learning outcomes 11.1)	91
SAQs 11.2 (tests learning outcomes 11.2)	91
SAQs 11.3 (tests learning outcomes 11.3)	91
Notes on SAQ	91

Study Session 1: Health assessment

Expected duration: 1 week or 2 contact hour

Introduction

Can you cast your mind back to any of your visit to the hospital where the doctor brings out some little instrument to check your body or touch some parts of your body for assessment? The doctor or health worker may even ask some funny questions about your physical self. This is called health assessment

In this study session you will learn about the aims and components of client health assessment and the preparation of the client before this procedure. We will also discuss the equipment needed and the positions which can be assumed by the client during the assessment process. This study session will conclude with a general survey of a client (a volunteer/ a mannequin).

Learning Outcomes for Study Session 1

When you have studied this session, you should be able to:

- 1.1 Explain the meaning and components of Health Assessment
- 1.2 State the reasons and purpose for carrying out health assessment
- 1.3 Describe the physical and psychological preparation of clients for health assessment
- 1.4 Explain assessment techniques in health assessment

1.1 The Meaning and components of health assessment

Assessment is the collection of data about an individual health state. Assessment and examination are terms which are sometimes used interchangeably. Both refer to a critical investigation and evaluation of client status. Many times, nurses are the first to detect changes in client's condition, regardless of the setting (Perry and Potter, 1998). The skills of physical assessment and examination are powerful tools with which to detect subtle as well as obvious changes in client health. By practising and developing the knowledge and skills of health assessment, you will develop confidence in understanding and responding to each client's situation.

1.1.2 Components of Health assessment

Health assessment involves physical examination and health history/ history taking.

The **health history** is a lengthy interview with a client/ an informant to gather subjective data about any presenting conditions.

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

1. Biographical data
2. Chief complaint

3. Present health concern (or present illness)
4. Past history
5. Family history
6. Review of systems
7. Patient profile

However, a more popular and widely accepted approach, even though lacking a general consensus, is the functional health patterns assessment tool developed by **Gordon**. This consists of 11 functional health patterns viz:

1. Health Perception and Management
Nutritional metabolic
2. Elimination
3. Activity exercise
4. Sleep rest
5. Cognitive-perceptual
6. Self-perception/self-concept
7. Role relationship
8. Sexuality reproductive
9. Coping-stress tolerance
10. Value-Belief Pattern
11. Role/relationship pattern

In **physical examination**, you may carry out a brief head to toe assessment, or a general survey such as when you meet a client for the first time (during admission); or you may decide to assess a particular system(e.g. musculoskeletal) following a complaint of pain on the foot by a hospitalized client.

In-text Question

Simply define health history

In-text Answer

The health history is a lengthy interview with a client/ an informant to gather subjective data about any presenting conditions

Although the sequence of physical examination depends on the circumstances and on the patient's reason for seeking health care, the complete examination usually proceeds as follows:

1. Skin
2. Head and neck
3. Thorax and lungs
4. Breasts
5. Cardiovascular system
6. Abdomen
7. Rectum
8. Genitalia
9. Neurologic system
10. Musculoskeletal system

It is anticipated that you have learnt "health history", a prerequisite in basic nursing course. You may therefore review the course as necessary.

1.2 The reasons/purpose for carrying out health assessment

Nurses use physical assessment to:

- Develop (obtain baseline data) and expand the data base from which subsequent phases of the nursing process can evolve
- To identify and manage a variety of patient problems (actual and potential)
- Evaluate the effectiveness of nursing care
- Enhance the nurse-patient relationship
- Make clinical judgments

1.2.1 Types of data in health assessment

- Subjective data – as explained by the client and obtained during health history (S)
- Objective data - Observed by the nurse and obtained during the physical examination (O)

1.3 Physical and psychological preparation of clients for health assessment

Pre- examination preparations- This involves three aspects viz:

- Preparation of client
- Preparation of environment
- Preparation of equipment

1. Preparing the client physically and psychologically

Almost everyone appreciates, and indeed needs an explanation of the physical examination. Clients are often anxious about what the nurse will find. A tense, anxious client will not be able to go through many of the physical manoeuvres required during an examination or to cooperate with the instructions of the nurse.

You can reduce client's anxiety and fear by conveying an open, receptive and professional approach. Your facial expression and the tone of your voice should be relaxed to put client at ease. They can be reassured during the examination by providing explanations at each step.

You should also remember to explain- using simple terms- when and where the examination will take place, why it is important and what will happen. Assure the client that all information obtained and documented is kept confidential. This means that only health professionals who have legitimate need to know the client's information will have access to it.

The clients are also prepared physically by encouraging the client to empty bladder and change his/her cloths. You should also help the client assume proper positions during the examination so that body parts are accessible and the client stays comfortable (See Figure 1.1)





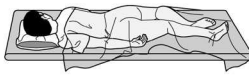

Position	Description	Areas Assessed	Cautions
 <p>Dorsal recumbent</p>	Back-lying position with knees flexed and hips externally rotated; small pillow under the head; soles of feet on the surface	Head and neck, axillae, anterior thorax, lungs, breasts, heart, extremities, peripheral pulses, vital signs, and vagina	May be contraindicated for clients who have cardiopulmonary problems. Not used for abdominal assessment because of the increased tension of abdominal muscles.
 <p>Supine (Horizontal recumbent)</p>	Back-lying position with legs extended; with or without pillow under the head	Head, neck, axillae, anterior thorax, lungs, breasts, heart, abdomen, extremities, peripheral pulses	Tolerated poorly by clients with cardiovascular and respiratory problems.
 <p>Sitting</p>	A seated position, back unsupported and legs hanging freely	Head, neck, posterior and anterior thorax, lungs, breasts, axillae, heart, vital signs, upper and lower extremities, reflexes	Elderly and weak clients may require support.
 <p>Lithotomy</p>	Back-lying position with feet supported in stirrups; the hips should be in line with the edge of the table.	Female genitals, rectum, and female reproductive tract	May be uncomfortable and tiring for elderly people and often embarrassing.
 <p>Sims'</p>	Side-lying position with lowermost arm behind the body, uppermost leg flexed at hip and knee, upper arm flexed at shoulder and elbow	Rectum, vagina	Difficult for the elderly and people with limited joint movement.
 <p>Prone</p>	Lies on abdomen with head turned to the side, with or without a small pillow	Posterior thorax, hip joint movement	Often not tolerated by the elderly and people with cardiovascular and respiratory problems.

Figure 1.1: Positions used during physical examination
Source: GOOGLE PICTURE

2. Prepare the environment














In order to promote the comfort of the client and ensure an efficient examination, you should ensure that the examination room / area has the following characteristics: privacy; a warm comfortable ambient temperature; proper examination clothing for the client; natural and artificial lights sources (natural lights can be controlled by drawing the curtain.

An instance in which you will need to vary natural/artificial lighting is during assessment of the eye in testing pupil reaction to light, and when using ophthalmoscope); control of outside noises; measures to prevent interruptions by visitors or other health care personnel; and a bed or table set at examiner's waist level.

3. Preparation of equipment/instrument

Equipment necessary for physical assessment should all be clean, in good working order and readily accessible (Berman, Snyder, Kozier and Erb, 2008). Equipment is usually already placed on trays or trolley ready for use. Some of the equipment used includes:

- Tape measure
- Tuning fork
- Patellar hammer
- Pen light
- ophthalmoscope

TABLE 28-3 Equipment and Supplies Used for a Health Examination		
Guidelines		Example
Flashlight or penlight		To assist viewing of the pharynx and cervix or to determine the reactions of the pupils of the eye
Laryngeal or dental mirror		To observe the pharynx and oral cavity
Nasal speculum		To permit visualization of the lower and middle turbinates; usually, a penlight is used for illumination
Ophthalmoscope		A lighted instrument to visualize the interior of the eye
Otoscope		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)
Percussion (reflex) hammer		An instrument with a rubber head to test reflexes
Tuning fork		A two-pronged metal instrument used to test hearing acuity and vibratory sense
Vaginal speculum (various sizes)		To assess the cervix and the vagina
Cotton applicators		To obtain specimens
Disposable pads		To absorb liquid
Gloves (sterile and unsterile)		To protect the nurse
Lubricant		To ease insertion of instruments (e.g., vaginal speculum)
Tongue blades (depressors)		To depress the tongue during assessment of the mouth and pharynx

Note: From Fundamentals of Nursing: Concepts, Process, and Practice, 6th ed., by B. Kozier, G. Erb, A. Berman, & K. Burke, 2000, Upper Saddle River, NJ: Prentice Hall Health.

Figure 1.2: Equipment used for health assessment/physical examination
Source: GOOGLE PICTURE

1.4 Assessment Techniques

The techniques of health assessment are four: They are:

- Inspection
- Palpation
- Percussion
- Auscultation

The acronym for this is **(IPPA)**

1. **Inspection:** This means critical observation using the senses, most often the eyes. You can inspect with the naked eye and using lighted instrument such as ophthalmoscope (used to view the eye). Other senses can also be used in addition to visual observation. See Figure 1.3. When you are using the sense of hearing, it is important that you have a quiet environment for accurate hearing.

TABLE 16–5 Using the Senses to Observe Client Data	
Sense	Example of Client Data
Vision	Overall appearance (e.g., body size, general weight, posture, grooming); signs of distress or discomfort; facial and body gestures; skin color and lesions; abnormalities of movement; nonverbal demeanor (e.g., signs of anger or anxiety); religious or cultural artifacts (e.g., books, icons, candles, beads)
Smell	Body or breath odors
Hearing	Lung and heart sounds; bowel sounds; ability to communicate; language spoken; ability to initiate conversation; ability to respond when spoken to; orientation to time, person, and place; thoughts and feelings about self, others, and health status
Touch	Skin temperature and moisture; muscle strength (e.g., hand grip); pulse rate, rhythm, and volume; palpatory lesions (e.g., lumps, masses, nodules)

Figure 1.3: Using senses to assess client
Source: GOOGLE PICTURE

- 2. Palpation:** This involves using the sense of touch for assessment. You can use the back of hand to assess skin temperature, while fingers can be used to assess texture, moisture, areas of tenderness, pulsation, presence of pain on pressure (See table 3). There are two types of palpation: light and deep. **Light (superficial) palpation** should always precede deep palpation because heavy pressure on the fingertips can dull the sense of touch.

Check the link below for a video of light and deep palpation:
http://www.youtube.com/watch?feature=player_detailpage&v=5MW1L7JRZz4

In **light palpation**, extend the fingers of your dominant hand parallel to the client’s skin and press gently. The depression is only slight. In deep palpation, you make use of the pads of one/both (bimanual) hands. When using one hand for deep palpation, the finger pads of the dominant hand press over the area to be palpated, while the other hand is often used to support a mass or an organ from below (Figure 1.4).

In bimanual palpation, one hand is placed over the other. You will extend the dominant hand as for light palpation, the place the finger pads of the non-dominant hand on the dorsal surface of the distal interphalangeal joint of the middle three fingers of the dominant hand.

The top hand applies pressure while the lower hand remains relaxed to perceive the tactile sensations (Figure 1.5). *Deep palpation is not done routinely because it requires caution as pressure can damage internal organs.*



Figure 1.4: Light Palpation
Source: GOOGLE PICTURE

3. Percussion is the act of **striking** the body surface to elicit sounds.

The note produced when you percuss (strike) a body surface depends on the quality of the underlying mass. The sound varies and could be dull or resonant (booming, echoing, reverberating, resounding) or flat or tympany.

The sound you hear when you strike the body surface will help you determine the size and shape of underlying structures by being able to establish their borders and indicate if tissue/organ is air-filled, fluid-filled, or solid.

In-text Question

What is palpation?

In-text Answer

This involves using the sense of touch for assessment

4. Auscultation – This means listening to sounds produced by the body

Direct auscultation – sounds are audible without stethoscope

Indirect auscultation – uses stethoscope

-Know how to use stethoscope properly (practice)

-Fine-tune your ears to pick up subtle changes (practice)

-Describe sound characteristics (frequency, pitch intensity, duration, and quality)

(practice)

- Flat diaphragm picks up high-pitched respiratory sounds best
- Bell picks up low pitched sounds such as heart murmurs
- Practice using BOTH diaphragms

PRACTICE

Nursing history is *subjective* - includes things like biographic data, the chief complaint, source of the data, history of present illness, past medical history, immunization history, allergies, habits (tobacco, ETOH), stressors, family history including genogram, patterns of health care, and a review of the body's systems

Activity 1.1

Take a moment to reflect on what you have read so far. Based on your nursing experience, and knowing that physical assessment can be time consuming, what are the components?

References

Fundamentals of nursing

Clinical Nursing skills and techniques

www.nvcc.edu/.../physical%20assessment/...

Summary of Study Session 1

In this study session, you have learnt that:

1. Assessment is the collection of data about an individual health state. Assessment and examination are terms which are sometimes used interchangeably
2. Health assessment involves physical examination and health history/ history taking.
3. A traditional approach includes the following:
 - Biographical data
 - Chief complaint
 - Present health concern (or present illness)
 - Past history
4. Nurses use physical assessment to:
 - Develop (obtain baseline data) and expand the data base from which subsequent phases of the nursing process can evolve
 - To identify and manage a variety of patient problems (actual and potential)
 - Evaluate the effectiveness of nursing care
5. Pre- examination preparations- This involves three aspects viz:
 - Preparation of client
 - Preparation of environment
 - Preparation of equipment
6. The techniques of health assessment are four: They are:
 - Inspection
 - Palpation
 - Percussion
 - Auscultation

Self-Assessment Questions (SAQs)

Now that you have completed this study, you can assess how well you have achieved its Learning outcomes by answering the following questions. Write your answers in your study Diary and discuss them with your Tutor at the next! Support meeting.

SAQ 1.1

Explain what you understand by assessment

State the traditional approach of assessment

SAQ 1.2

Give reasons for conducting health assessment

SAQ 1.3

Give short explanations of the three pre-examination preparations

SAQ 1.4

Explain the assessment techniques

Study Session 2: A Quick Head - To - Toe Assessment and General Survey

Expected duration: 1 week or 2 contact hour

Introduction

In this study session, you will learn how to assess a client from head to toe. You will also learn how to carry out a general survey. Of course, you must have learnt these in your basic nursing course. However, this course will assist you to review your practice. It is a practical based course.

Learning Outcomes for study session 2

When you have studied this session, you should be able to:

- 2.1 Describe the meaning and components of health assessment
- 2.2 Describe the steps of head to toe and general survey assessment
- 2.3 List some of the equipment required for head to toe assessment

2.1 General Survey

The general survey is the first step in a head to toe assessment. Information gathered during general survey offers clues about the overall health of the client. When you meet the client for the first time, try to observe the characteristics of the client and form an overall impression if possible before interacting with the client.

The survey begins a review of the client's primary health problems. It also includes the assessment of the client's vital signs, height and weight, and general behaviour and appearance.

The survey will provide you information about characteristic of an illness, client's hygiene, and body image, emotional state, recent changes in weight, and developmental status. Assessment of vital signs, height and weight will not be dealt with during this course since this study session is for trained nurse.

In-text Question







The survey begins a review of the client'shealth problems.


- A. Secondary
- B. Major
- C. Primary
- D. Various

In-text Answer

Answer is C, Primary

Table 2.1

Equipment	Image
Stethoscope	
Sphygmomanometer and cuff	
Thermometer	
Standing platform scale or stretcher scale	
Table model/basket scale	
Digital watch or watch with second hand	

Tape measure	
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2.2. Steps of head to toe and general survey assessment

ACTION	RATIONALE
1. Introduce yourself and verify the client's identity. Explain to the client what you are going to do, why it is necessary, and how she can cooperate	This action ensures that the client cooperates throughout the procedure
2. Perform hand hygiene and observe other appropriate infection control procedures	This prevents transmission of infection to the client
3. Provide for client privacy	This minimizes client embarrassment
4. Observe body build, height, and weight in relation to the client's age, lifestyle, and health	This helps determine whether these parameters are within the normal limit
5. Observe the client's overall hygiene and grooming. Relate these to the person's activities prior to the assessment.	Grooming may reflect activity level prior to examination, resources available to purchase grooming supplies, client's mood, and self care practices
6. Observe the client's posture and gait, standing, sitting, and walking.	Normal posture should be erect and relaxed.
7. Note body and breathe odour in relation to activity level.	There should be absence of breath and body odour
8. Observe for signs of distress in posture or facial expression.	This may reveal musculoskeletal problem, mood or pain
9. Note obvious signs of health or illness (e.g in skin colour or breathing)	This gives an idea of the present state of client's health status
10. Assess the client's attitude. Note the client's affect/mood; assess the appropriateness of the client's responses.	Reflects client's feelings and emotional status
11. Listen for quantity, quality, and organization of speech.	Speech should be understandable, at moderate pace with clear tone and inflection. Client should exhibit thought association. Any deviation may reflect neurological impairment, injury or impairment of mouth, or indifferences in dialect and language.
12. Listen for relevance and organization of thoughts.	Thought should follow a logical sequence, make sense with sense of reality
13. Document findings in the client record.	Provides means of determining changes in client's condition over time.

Note if client is in any acute distress: difficulty breathing, pain, anxiety. If these are present defer general examination till later.

2.3. System by system method of head to toe assessment

1. **Observe the general appearance** – This involves checking recent weight change, fatigue, and fever
2. **Inspect the skin** – This involves checking for rashes, lesions, changes, dryness, itching, color change, hair loss, and change in hair or nails
3. **Eyes** - Observe change in vision, presence of floaters, use of glasses, pain
4. **Ears** – Observe for pain, loss of hearing, vertigo, ringing, discharge, infections
5. **Nose and sinuses** –Ask the client about frequent colds, congestion, nosebleed
6. **Mouth and throat** -Observe condition of teeth and gums, last dental visit, hoarseness, frequent sore throats
7. **Neck** - Observe lumps, stiffness, goiter
8. **Breasts** – Observe lumps, pain, discharge, BSE
9. **Respiratory** – Observe cough, sputum, wheezing, asthma, COPD, last PPD, and last CXR, smoking history (can do here, or with “habits”)
10. **Cardiac** – Observe heart trouble, chest pain, SOB, murmur, h/o rheumatic fever, past ECG, FH of heart disease <50 yrs of age
11. **GI** – Observe problems swallowing, heartburn, vomiting, bowel habits, pain, jaundice
12. **Urinary** – Observe frequency, incontinence, pain, burning, hesitancy, nocturia, polyuria
13. **Genitalia** – Observe lesions, discharge, sexual orientation, sexual function, menstrual history, contraception, pregnancy history, TSE
14. **Peripheral vascular** –Observe intermittent claudication, varicose veins, blood clots
15. **MS** – Observe muscle or joint pain, redness, stiffness, warmth, swelling, family history
16. **Neurology** - fainting, blackouts, seizures, weakness
17. **Endocrine** -Observe sweats, skin change, heat or cold intolerance, excessive thirst (polydipsia), excessive urination (polyuria), weight change, menstrual changes
18. **Psychiatric** -Observe mental illness, thoughts of harming self or others

Activity 1.1

Head to toe assessment should follow a definite order. When might you change order of the examination?

Activity 1.2

Is the nursing process of the hospital where you practice comprehensive? What problems do you encounter when using the nursing process format available?

Summary of Study Session 2

In this study session, you have learnt that:

1. The general survey is the first step in a head to toe assessment. Information gathered during general survey offers clues about the overall health of the client.

2. The survey begins a review of the client's primary health problems. It also includes the assessment of the client's vital signs, height and weight, and general behaviour and appearance.
3. The first step in general head to toe survey is to introduce you and verify the client's identity. Explain to the client what you are going to do, why it is necessary, and how she can cooperate
4. The system to system survey involves observing general appearance, inspecting skin, nose, ears, sinuses, mouth and throat, neck, breasts, respiratory, etc.

Self-Assessment Questions (SAQs)

Now that you have completed this study, you can assess how well you have achieved its Learning outcomes by answering the following questions. Write your answers in your study Diary and discuss them with your Tutor at the next! Support meeting.

SAQ 2.1

Explain general survey

SAQ 2.2

Explain the action and rationale in head to toes assessment

SAQ 2.3

Give detailed explanation of system by system head to toe assessment

Study Session 3: Respiratory system assessment

Expected duration: 1 week or 2 contact hour

Introduction

The respiratory system is made up of the organs in your body that help you to breathe. Remember, that Respiration enables breathing. The goal of breathing is to deliver oxygen to the body and to take away carbon dioxide

In this study session you will learn about the assessment of the respiratory system. This shall focus specifically on description of chest landmarks; normal and abnormal breath sounds; and assessment of the thorax and lungs.

The assessment of the respiratory system shall be in two parts. First, you will learn how to obtain health history from clients with respiratory system complaints. Secondly, you will be educated on the step – by - step technique of examination of the respiratory system. You will be asked to carry out some activities which you can post on my blog. Extra marks shall be awarded for the activities.

Learning Outcomes for study session 3

When you have studied this session, you should be able to:

- 3.1 Explain the overview of respiratory assessment
- 3.2 Describe some chest landmarks
- 3.3 Describe five abnormalities of the chest wall
- 3.4 Differentiate between normal and abnormal (adventitious) breath sounds
- 3.5 Describe how you will carry out respiratory assessment on a client

3.1 Overview of respiratory assessment

The assessment of the respiratory system (thorax and lungs) is fundamental to determining the client's oxygenation status. Changes in the respiratory system can happen suddenly or gradually. Pneumonia for instance is sudden in onset. Chronic Obstructive Pulmonary Diseases (COPD) such as asthma, chronic bronchitis and emphysema are gradual in onset.

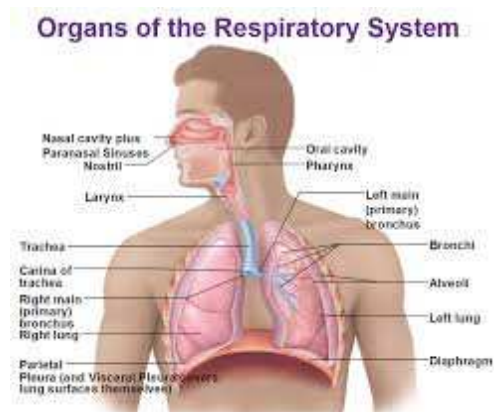


Figure 3.1: Organs of the Respiratory System

Source: GOOGLE PICTURE

The nurse must be conversant with the landmarks of the chest in order to identify the underlying organ. This will also help the nurse to document abnormal assessment findings. It is furthermore important for a nurse to be able to identify abnormal chest size and shape in clients as these affect air exchange.

Familiarity with breath sounds will assist you as a nurse to detect changes in patient's breathing and manage the situation appropriately.

In-text Question

The assessment of the respiratory system is fundamental to determining the client's ...

- A. Oxygenation status
- B. Carbonization status
- C. Health status
- D. Breathing status

In-text Answer

Answer is A, Oxygenation status

3.2 Chest landmarks

Chest landmarks consist of a series of imaginary lines on the chest wall; the ribs; and some spinous processes. The imaginary lines consist of three series of lines (anterior, lateral and posterior).

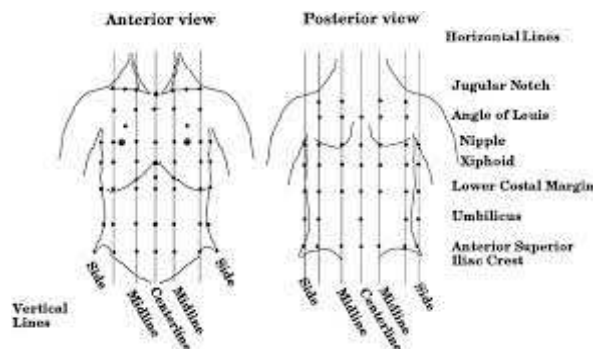


Figure 3.1: Chest landmarks

Source: GOOGLE PICTURE

- A. The anterior series of lines consist of the following:
 - 1. The midsternal line: This is a vertical line that runs through the centre of the sternum
 - 2. The midclavicular line (right and left): These are vertical lines from the midpoints of the clavicles.
- B. The lateral series of lines consist of three lines:
 - 1. Anterior axillary lines (right and left): They are vertical lines from the anterior axillary fold
 - 2. Midaxillary line : This is a vertical line from the apex of the axilla
 - 3. Posterior axillary line: This is a vertical line from the posterior axillary fold.
- C. The posterior series of lines consist of
 - 1. The vertebral line: This is a vertical line along the spinous processes from C7 to T12

2. The scapular lines (right and left) are vertical lines from inferior angles of the scapulae

Establishing the position of each rib and specific spinous processes will help you determine the underlying lobes of the lung. Before you can locate the rib anteriorly, you must first identify the **angle of Louis**.

Angle of Louis is the junction between the body of the sternum (breastbone) and the manubrium (the upper part of the sternum to which the clavicle is joined). You will recall that anteriorly, most ribs are attached to the sternum.

The upper border of the second rib attaches to the sternum at this manubriosternal junction (angle of Louis). If you want to locate the manubrium, you will first palpate the clavicle and follow its course to where it attaches to the manubrium. Then, you can palpate and count distal ribs and intercostal spaces (ICSs) from the second rib.

In-text Question

Simply define Midaxillary line

In-text Answer

This is a vertical line from the apex of the axilla

The ICS is named after the rib above the space. You should remember to palpate along the midclavicular line when palpating for rib identification.

3.2.1 Position/Lighting/Draping

Position –

- Patient should sit upright on the examination table.
- The patient's hands should remain at their sides.
- When the back is examined the patient is usually asked to move their arms forward) *hug themselves position* (so that the scapulae are not in the way of examining the upper lung fields.

Lighting - adjusted so that it is ideal.

Draping - the chest should be fully exposed. Exposure time should be minimized.

The basic steps of the examination

Can be remembered with the mnemonic IPPA:

- Inspection
- Palpation
- Percussion
- Auscultation

Health history

1. Any risk factors for respiratory disease
2. Smoking
 - a. pack years ppd X # years
 - b. exposure to smoke
 - c. history of attempts to quit, methods, results
3. Sedentary lifestyle, immobilization
4. Age
 - a. environmental exposure
 - b. Dust, chemicals, asbestos, air pollution

5. Obesity
6. Family history

Cough

- Type : dry, moist, wet, productive, hoarse, hacking, barking, whooping
- Onset
- Duration
- Pattern : activities, time of day, weather
- Severity :effect on ADLs
- Wheezing
- Associated symptoms
- Treatment and effectiveness

SPUTUM

- Amount
- Color
- Presence of blood (hemoptysis)
- Odor
- Consistency
- Pattern of production

PAST HEALTH HISTORY

- Respiratory infections or diseases (URI)
- Trauma
- Surgery
- Chronic conditions of other systems
- Family Health History
- Tuberculosis
- Emphysema
- Lung Cancer
- Allergies
- Asthma

INSPECTION

- Tracheal deviation (can suggest of tension pneumothorax)

3.3 Chest wall deformities

The following are examples of chest deformities

1. Kyphosis: This means curvature of the spine anterior-posterior



Figure 3.2: Kyphosis
Source: GOOGLE PICTURE

2. Scoliosis: This is the curvature of the spine lateral



Figure 3.3: Scoliosis
Source: GOOGLE PICTURE

3. Barrel chest: In this condition, chest wall increased anterior-posterior; normal in children; typical of hyperinflation seen in COPD

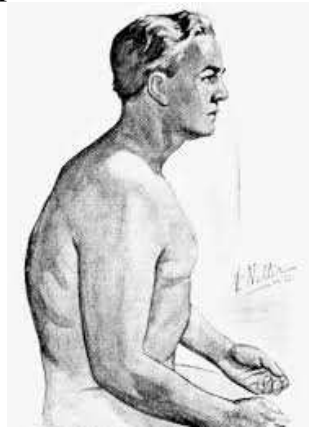


Figure 3.4: Barrel Chest
Source: GOOGLE PICTURE

4. Pectus excavatum (cobbler's chest): Pectus excavatum, also known as sunken or funnel chest, is a congenital chest wall deformity in which several ribs and the sternum grow abnormally, producing a concave, or caved-in, appearance in the anterior chest wall



Figure 3.5: Pectus excavatum (cobbler's chest)
Source: GOOGLE PICTURE

5. Pectus carinatum (pidgeon chest): Pectus carinatum may occur as a solitary abnormality or in association with other genetic disorders or syndromes. The condition causes the sternum to protrude, with a narrow depression along the

sides of the chest. This gives the chest a bowed-out appearance similar to that of a pigeon.



Figure 3.6: Pectus carinatum
Source: GOOGLE PICTURE

In-text Question

Pectus excavatum is also known as

In-text Answer

Cobbler's chest

3.4: Practical Steps for Respiratory Assessment

Tactile fremitus

This is vibration felt by palpation. Place your open palms against the upper portion of the anterior chest, making sure that the fingers do not touch the chest. Ask the patient to repeat the phrase “ninety-nine” or another resonant phrase while you systematically move your palms over the chest from the central airways to each lung's periphery.

You should feel vibration of equally intensity on both sides of the chest. Examine the posterior thorax in a similar manner. The fremitus should be felt more strongly in the upper chest with little or no fremitus being felt in the lower chest.



Assessment of expiration



Chest expansion during inspiration



Percussion over the anterior chest



Direct percussion of the clavicles for disease in the lung apices



AUSCULTATION

- To assess breath sounds, ask the patient to breathe in and out slowly and deeply through the mouth.
- Begin at the apex of each lung and zigzag downward between intercostal spaces. Listen with the diaphragm portion of the stethoscope.



5.47 Auscultation of the chest using the diaphragm.

- Normal breath sounds
- Note
- Pitch
- Intensity
- Quality
- Duration

NORMAL BREATH SOUND

- **Bronchial** :Heard over the trachea and mainstem bronchi (2nd-4th intercostal spaces either side of the sternum anteriorly and 3rd-6th intercostal spaces along the vertebrae posteriorly). The sounds are described as tubular and harsh. Also known as tracheal breath sounds.
- **Bronchovesicular** :Heard over the major bronchi below the clavicles in the upper of the chest anteriorly. Bronchovesicular sounds heard over the peripheral lung denote pathology. The sounds are described as medium-pitched and continuous throughout inspiration and expiration.
- **Vesicular** :Heard over the peripheral lung. Described as soft and low- pitched. Best heard on inspiration.
- **Diminished** :Heard with shallow breathing; normal in obese patients with excessive adipose tissue and during pregnancy. Can also indicate an obstructed airway, partial or total lung collapse, or chronic lung disease.

Steps to the Procedure

S/N	ACTION	RATIONALE
1	Introduce yourself and verify the client's identity. Explain to the client what you are going to do, why it is necessary, and how the client can cooperate	This shows respect for the client, your professionalism, makes the client feel comfortable and relaxed and trust your actions.
2	Perform hand hygiene and observe other appropriate infection control procedures	This reduces the spread of microorganisms
3	Provide for client privacy	This ensures confidentiality and respect for the client.
4	Inquire if client has any history of the following: • Family history of illness, including	This serves as a baseline data during assessment.

	<p>cancer</p> <ul style="list-style-type: none"> • Allergies • Tuberculosis • Lifestyle habits, such as smoking, and occupational hazards • Any medications being taken <p>• Current problems such as swellings, coughs, wheezing, pain</p>	
5	<p>Assessment</p> <p>Posterior thorax: Inspect the shape and symmetry of the thorax from posterior and lateral views. Compare the anteroposterior diameter to the transverse diameter.</p>	<p>This indicates any deviation from normal such as barrel chest (there is increased anteroposterior to transverse diameter). Also shows thorax asymmetric.</p>
6	<p>Inspect the spinal alignment for deformities: Have the client stand. From a lateral position, observe the three normal curvatures: cervical, thoracic, and lumbar</p>	<p>This indicates any deviation from normal such as exaggerated curvatures(kyphosis, lordosis)</p>
7	<p>To assess for lateral deviation of the spine (scoliosis), observe the standing client from the rear. Have the client bend forward at the waist and observe from behind.</p>	<p>This indicates any deviation from normal such as the deviation of the spine to one side which is noticeable when bending over and the uneven shoulders or hips.</p>
8	<p>Palpate the posterior thorax: For clients who have no respiratory complaints, rapidly assess the temperature and integrity of all chest skin</p> <p>ii. For clients who do have respiratory complaints, palpate all chest areas for bulges, tenderness, or abnormal movements. Avoid deep palpation for painful areas, especially if a fractured rib is suspected.</p>	<p>This indicates any deviation from normal such as skin lesions or areas of hyperthermia.</p> <p>This indicates any lumps, bulges, depressions, areas of tenderness, movable structures such as ribs</p>
9	<p>Palpate the posterior chest for respiratory excursion: Place the palms of both your hands over the lower thorax, with your thumbs adjacent to the spine and your fingers stretched laterally. Ask the client to take a deep breath while you observe the movement of your hands and any lag in movement.</p>	<p>This indicates any deviation from normal such as asymmetric and/or decreased thorax expansion.</p>

10.	<p>Palpate the chest for vocal (tactile) fremitus.: Place the palmar surfaces of your fingertips or the ulnar aspect of your hand or closed fist on the posterior chest, starting near the apex of the lungs</p> <p>Ii. Ask the client to repeat such words as “blue moon” or “one, two, three.”</p> <p>iii. Repeat the two steps, moving your hands sequentially to the base of the lungs.</p>	<p>This indicates any deviation from normal such as decreased or absent fremitus which is associated with pneumothorax. Also increased fremitus which is associated with consolidated lung tissue as seen in pneumonia</p>
11.	<p>Percuss the thorax.</p>	<p>This determines if the lung tissue is filled with air, liquid, or solid material and to observe the positions of the internal organs</p>
12.	<p>Percuss for diaphragmatic excursion.</p>	
13.	<p>Auscultate the chest using the flat-disc diaphragm of the stethoscope</p>	<p>The diaphragm of the stethoscope is best for transmitting high-pitched breath sounds. Adventitious sounds such as crackles, wheezes, gurgles can be detected.</p>
14.	<p>Use the systematic zigzag procedure used in percussion</p>	
15	<p>Ask the client to take slow, deep breaths through the mouth. Listen at each point to the breath sounds during a complete inspiration and expiration.</p>	
16	<p>Compare findings at each point with the corresponding point on the opposite side of the chest.</p>	
17	<p>Anterior Thorax Inspect breathing patterns. Inspect the costal angle and the angle at which the ribs enter the spine.</p>	<p>This determines abnormal breathing patterns. This indicates abnormality such as widened costal angle as seen in COPD.</p>

ACTION	RATIONALE
	This determines asymmetry in the anterior chest.

<p>18. Palpate the anterior chest. Place the palms of both your hands on the lower thorax, with your fingers laterally along the lower rib cage and your thumbs along the costal margins Ask the client to take a deep breath while you observe the movement of your hands.</p>	<p>Same as for posterior fremitus</p>
<p>19. Palpate tactile fremitus in the same manner as for the posterior chest. If the breasts are large and cannot be retracted adequately for palpation, this part of the examination usually is omitted.</p>	<p>This determines asymmetry in the anterior chest as well as areas of dullness or flatness over the lung tissue.</p> <p>This determines adventitious breath sounds.</p> <p>This determines adventitious breath sounds.</p>
<p>20. Percuss the anterior chest systematically. Begin above the clavicles in the supraclavicular space, and proceed downward to the diaphragm.</p>	<p>This provides detailed information about the client for further management.</p>
<p>21. Compare one side of the lung to the other. Displace female breasts for proper examination.</p>	
<p>22.</p>	<p>Auscultate the trachea.</p>
<p>23.</p>	<p>Auscultate the anterior chest. Use the sequence used in percussion, beginning over the bronchi between the sternum and the clavicles.</p>
<p>24.</p>	<p>Document findings in the client record.</p>

Summary of Study Session 3

In this study session, you have learnt that:

1. The assessment of the respiratory system (thorax and lungs) is fundamental to determining the client's oxygenation status.
2. Chest landmarks consist of a series of imaginary lines on the chest wall; the ribs; and some spinous processes. The imaginary lines consist of three series of lines (anterior, lateral and posterior).
3. Examples of chest wall diseases are kyphosis, scoliosis, barrel chest, Pectus excavatum (cobble's chest), Pectus carinatum (pigeon chest)

Self-Assessment Questions (SAQs)

Now that you have completed this study, you can assess how well you have achieved its Learning outcomes by answering the following questions. Write your answers in your study Diary and discuss them with your Tutor at the next! Support meeting.

SAQ 3.1

To the best of your understanding, explain the overview of the respiratory system

SAQ 3.2

With the aid of a diagram, explain the chest landmark

SAQ 3.3

Give examples of chest wall deformities, and explain them.

SAQ 3.4

Explain the practical steps to respiratory assessment

Study Session 4: Performing Postural Drainage

Expected duration: 1 week or 2 contact hour

Introduction

Postural drainage is an airway clearance technique that drains secretions from specific lung and bronchi segment into the trachea. It is also called segmented bronchial drainage.

This study session will enable you to know about postural drainage, reasons for a postural drainage, how to determine the areas to be selected for postural drainage, clients who should have postural drainage as well as clients who cannot have postural drainage. It also includes the articles needed for postural drainage and the step-by-step technique.

Learning Outcomes for study session 4

At the end of this study session, you should be able to:

- 4.1. Explain the meaning of postural drainage.
- 4.3. State the positions for draining different areas of lungs
- 4.4. State the step-by-step technique of postural drainage.

4.1 Postural drainage

Postural drainage is the gravitational clearance of secretions from specific bronchial segments by using one or more of ten different positions.

Each position drains a specific corresponding section of the tracheobronchial tree, either from the upper, middle or lower lung field into the trachea. Coughing or suctioning can then remove secretions from the trachea.

The Reasons for postural drainage are as follows:

- The presence of accumulated secretions can promote bacterial growth leading to infection.
- The secretions can obstruct the smaller airway passages and can cause atelectasis.

Areas for drainage can be selected based on:

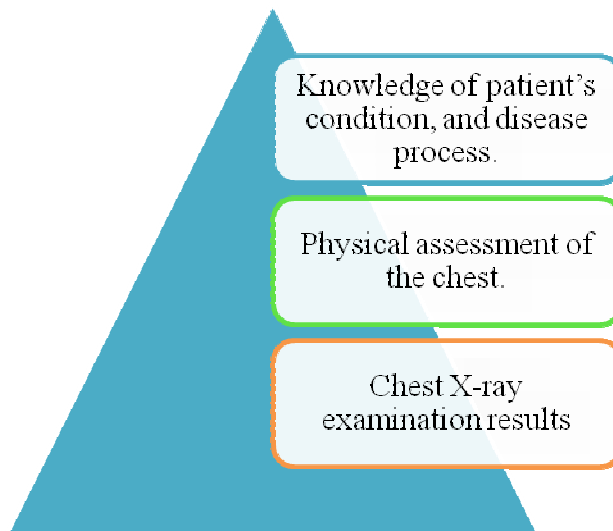


Figure 4.1: Basis for area of drainage
Source: GOOGLE PICTURE

What kind of people can have postural drainage i.e indications

The following are the class of people who can have postural drainage

1. Bronchiectasis
2. Cystic Fibrosis
3. Chronic obstructive pulmonary disease (COPD)

What kind of people would postural drainage be harmful to i.e. contraindications?

Postural drainage would be harmful to the following group of people, with health conditions listed below:

1. Increased intracranial pressure (ICP)
2. Unstable head or neck injury
3. Active hemorrhage with hemodynamic instability
4. Recent spinal surgery or injury
5. Empyema
6. Bronchopleural fistula
7. Rib fractures or flail chest
8. Lung tumor
9. Diseases of chest wall
10. Hemorrhage in respiratory tract
11. Painful chest conditions
12. Tuberculosis
13. Osteoporosis.

In-text Question

The postural drainage involves one of the following

- A. Two or more of ten different positions
- B. Three or more of five different positions
- C. One or more of four different positions
- D. One or more of ten different positions**

In-text Answer

Answer is D, One or more of ten different positions

4.2 Positions for Draining Different Areas of Lungs

1. **Left and right upper lobe anterior apical bronchi:** you will have patient sit in chair leaning back. Percuss with cupped hands and vibrate with heels of hands at shoulders and with fingers over collarbone. Both sides can be done at the same time. Note body posture and arm position of nurse. Nurse's back is kept straight and elbows and knees are slightly flexed.
2. **Left and right upper lobes posterior apical bronchi:** you will have patient sit in chair leaning forward on pillow or cardiac table. Percuss and vibrate with hands on either side of the upper spine, can do both sides at the same time.
4. **Right and left anterior upper lobe bronchi:** you will have patient lie flat on back with small pillow under knees. Percuss and vibrate just below clavicle on either side of sternum.
5. **Left upper lobe lingular bronchus:** you will have patient lie on right side with arm over head in Trendelenburg position with foot of bed raised 30cm. Place pillow behind back and roll patient one-fourth on to pillow Percuss and vibrate lateral to left nipple below axilla.
6. **Right middle lobe bronchus:** you will have patient lie on left side, raise foot of bed 30cm. Place pillow behind back and roll patient one-fourth turned on to pillow. Percuss and vibrate area of right nipple below axilla.
7. **Left and right anterior lower lobe bronchi:** you will have patient lie on back in Trendelenburg position, with foot of bed elevated 45 – 50cm. Have knees bent on pillow. Percuss and vibrate over lower anterior ribs on both sides.
8. **Right lower lobe lateral bronchus:** you will have patient lie on left side in Trendelenburg position with foot of bed raised to 45 to 50cm. Percuss and vibrate right side of the chest below scapula posterior to mid axillary line.
9. **Left lower lateral bronchus:** you will have patient lie on right side in Trendelenburg position with foot of bed raised to 45 to 50cm. Percuss and vibrate left side of the chest below scapula posterior to mid axillary line.
10. **Right and left lower lobe superior bronchi:** you will have patient lie flat on stomach with pillow under stomach. Percuss and vibrate below scapulae on either side of spine.
11. **Left and right posterior basal bronchi:** you will have patient lie on stomach in Trendelenburg position with foot of bed elevated 40 to 50cm. Percuss and vibrate over posterior ribs on either side of spine.

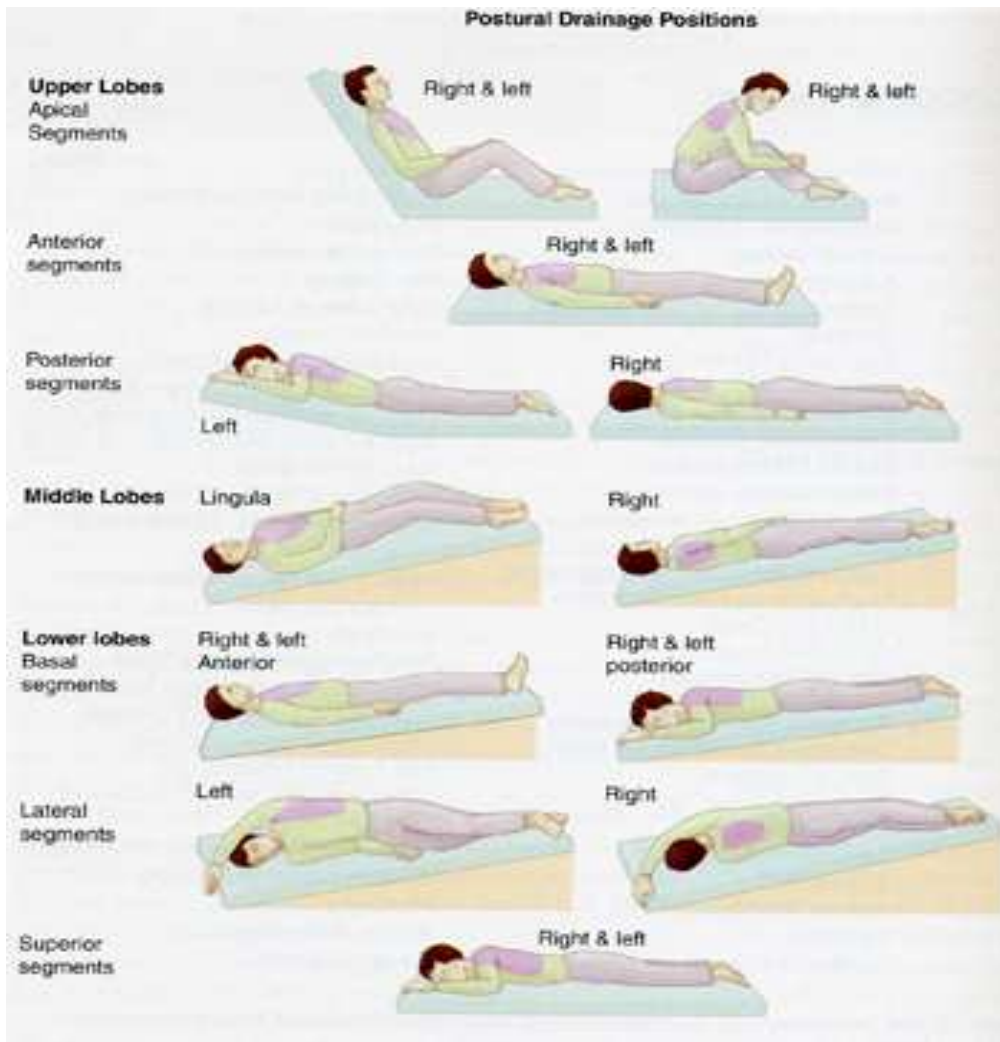


Figure 4.2: Positions for draining different areas of the Lungs.
Source: GOOGLE PICTURE

Articles needed

1. A comfortable surface, that can be slanted such as hospital beds in Trendelenburg's position or tilt table and chair for draining upper lobe areas.
2. One to four pillows, depending on patient's posture and comfort.
3. A glass with water.
4. Tissues and paper bag.
5. Sputum cup.

4.3 Step-By-Step Technique of Postural Drainage

Nursing Action	Rationale
1. Identify patient and check physician's order for specific instructions for postural drainage.	Performs correct procedure for the right patient.
2. Assess for possible impairment of airway clearance.	Certain circumstances, disease process, and conditions place patient at risk for

<p>3. Identify signs and symptoms that indicate need to perform postural drainage such as changes in X-ray film consistent with atelectasis, pneumonia, bronchiectasis, ineffective coughing with thick sticky tenacious sputum and abnormal breath sounds such as wheezing, crackling and gurgling</p> <p>4. Identify which bronchial segments need to be drained by reviewing chest X-ray reports. Auscultate over all lung fields for wheezes, crackles and gurgles, palpate over all lung fields for crepitus, fremitus and chest expansion</p>	<p>impaired airway clearance.</p> <p>X-ray film data and signs and symptoms indicate accumulation of pulmonary secretions.</p> <p>Area of lung congestion and postures for drainage will vary depending on disease process, patient condition and patient problem. Areas most in need of and responsive to postural drainage usually can be easily identified by presence of early inspiratory crackles and gurgles.</p>
<p>5. Wash hands</p> <p>6. Select congested areas to be drained based on assessment of all lung fields, clinical data and chest X-ray data</p> <p>7. Place patient in position to drain congested areas. Area selected may vary from patient to patient. Help patient assume position as needed. Teach patient correct posture and arm and leg positioning, place pillows for support and comfort.</p> <p>8. Have patient maintain posture for 10 to 15 minutes</p> <p>9. During 10 to 15 minutes of drainage in each posture, perform chest percussion and vibration over areas being drained.</p> <p>10. After 10 to 15 minutes of drainage in first posture, have patient sit up and cough. Save expectorated secretions in clear container. If patient cannot cough suctioning to be performed.</p> <p>11. Have patient rest briefly if necessary.</p>	<p>Reduces transmission of microorganisms.</p> <p>To be effective, treatment must be individualized to treat specific areas involved.</p> <p>Specific positions are selected to drain each area involved.</p> <p>In adults, draining each area takes time.</p> <p>These maneuvers provide mechanical forces that aid in mobilization of airway secretions.</p> <p>Secretions mobilized into central airways should be removed by coughing or suctioning before placing patient into next drainage position. Coughing is most effective when patient is sitting up and leaning forward.</p> <p>Short rest periods between postures can prevent fatigue and help patient for better tolerance to therapy</p>

<p>12. Have patient take sips of water</p> <p>13. Repeat procedure until all congested areas selected have been drained. Each treatment should not exceed 20 to 30 minutes.</p> <p>14. Wash hands</p> <p>15. Record in nurse's notes baseline and post therapy assessment of chest, frequency and duration of treatment, postures used and bronchial segments drained, cough effectiveness, need for suctioning, color, amount and consistency of sputum, hemoptysis or other unexpected outcome, patient's tolerance and reactions.</p>	<p>Keeping mouth moist aids in expectoration of secretions.</p> <p>Postural drainage is used only to drain areas involved and is based on individual assessment.</p> <p>Reduces transmission of microorganisms.</p> <p>Helps to evaluate outcomes and need for changes in therapy.</p>
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Special Considerations

- Client may be given bronchodilators or nebulisation before a postural drainage to loosen secretions.
- The procedure is usually done 1hour before meal or 3hours after meal. Shortly after meals can induce vomiting.
- The frequency of the procedure is usually 2-4times/day

Activity 4.1

Discuss the positions for draining different areas of the lungs.

Summary of Study Session 4

1. Postural drainage is the gravitational clearance of secretions from specific bronchial segments by using one or more of ten different positions.
The Reasons for postural drainage are as follows:
 - The presence of accumulated secretions can promote bacterial growth leading to infection.
 - The secretions can obstruct the smaller airway passages and can cause atelectasis.
2. The following are the class of people who can have postural drainage
 - Bronchiectasis
 - Cystic Fibrosis
 - Chronic obstructive pulmonary disease (COPD)
3. The positions for draining different areas of the lungs are:
 - Left and right upper lobe anterior apical bronchi
 - Left and right upper lobes posterior apical bronchi
 - Right and left anterior upper lobe bronchi

- Left upper lobe lingular bronchus

Self-Assessment Questions (SAQs)

Now that you have completed this study, you can assess how well you have achieved its Learning outcomes by answering the following questions. Write your answers in your study Diary and discuss them with your Tutor at the next! Support meeting.

SAQ 4.1

Explain postural drainage, and the reason why it is done

SAQ 4.2

Explain some of the positions for draining.

SAQ 4.3

Explain some of the steps by step techniques involved in postural drainage

References

1. Fundamentals of Nursing
2. Medical&Surgical Nursing-Assessment and Management of Clinical problems.
3. Brunner & Suddarth Medical&Surgical Nursing.

Study Session 5: Assisting the Patient with the use of an Incentive Spirometer

Expected duration: 1 week or 2 contact hour

Introduction

Incentive Spirometry is a method of deep breathing that provides visual feedback to encourage the patient to inhale slowly and deeply to maximize lung inflation and prevent or reduce atelectasis. It is also referred to as sustained maximal inspiration.

In this study session, you will learn about Incentive Spirometry, the reasons why it is performed and the clients who need incentive spirometry. The types of incentive spirometer will be discussed as well as the necessary requirements and the steps involved.

Learning Outcomes

At the end of this study session, you should be able to:

- 5.1 Define the term incentive spirometry.
- 5.2 State the types of incentive spirometer.
- 5.3 State the step-by-step technique of incentive spirometry.

5.1 Incentive Spirometry

Incentive spirometry means assisting the patient for voluntary deep breathing by providing visual feedback about inspiratory volume by using a specially designed apparatus called spirometer.

The following are the reasons for incentive spirometry i.e Purposes

1. To improve pulmonary ventilation.
2. To counteract the effects of anesthesia or hypoventilation.
3. To loosen respiratory secretions
4. To facilitate respiratory gaseous exchange.
5. To expand collapsed alveoli.
6. To prevent postoperative respiratory complications.

5.1.1 Who are the clients who needs incentive spirometry i.e Indications

The following types of client's needs incentive spirometry

1. Patients on long-term bed rest.
2. Patients with chronic obstructive and restrictive lung diseases.
3. Patients on medications that depress respiration.
4. Postoperative patients.

In-text Question

..... is the instrument used in performing incentive spirometry?

- A. Thermometer
- B. Barometer
- C. Spirogyte
- D. Spirometer

In-text Answer

Answer is D, Spirometer

5.2 Types of incentive spirometer.

The following are the types of incentive spirometer

1. **Volume-oriented spirometers:** The tidal volume of the spirometer is set according to the manufacturer's instructions.

Purposes: To ensure that the volume of air initiated is increased gradually as the patient takes deeper and deeper breaths.

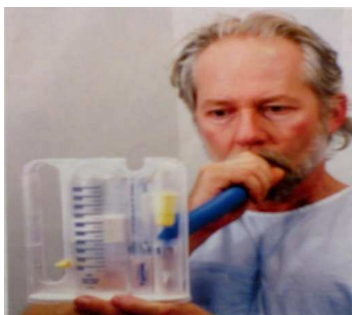


Figure 5.1: Volume-oriented spirometers

Source: GOOGLE PICTURE

2. **Flow-oriented spirometers:** This type of spirometer has no preset volume. The spirometer contains a number of movable balls that are pushed up by the force of the breath and held suspended in the air while the patient inhales. The amount of air inhaled and the flow of the air are estimated by how long and how high the balls are suspended.



Figure 5.2: Flow-oriented spirometers

Source: GOOGLE PICTURE

Articles Needed

1. Stethoscope
2. Incentive spirometer with appropriate mouthpiece.
 - a. Flow-oriented or
 - b. Volume-oriented
3. Tissue paper
4. Emesis basin
5. Pillow if needed.

In-text Question

Flow-oriented spirometers are types of spirometer with no preset volume. TRUE OR FALSE

In-text Answer

TRUE

5.3 Step-By-Step Technique of Incentive Spirometry

Nursing action	Rationale
<ol style="list-style-type: none">1. Explain the reason and objective for the therapy that the inspired air helps to inflate the lungs. The ball or weight in the spirometer will rise in response to the intensity of the intake of air. The higher the ball rises, the deeper the breath.2. Assess the patient's respiratory status by general observation, auscultation of breath sounds and percussion of thorax.3. Review medical record for recent arterial blood gas.4. Remove dentures5. Wash hands6. Instruct patient to assume a semi Fowler's or high Fowler's position.7. Set pointer on incentive spirometer at appropriate level or point to level where disk or ball should reach.	<p>Helps in obtaining cooperation of patient.</p> <p>* Helps in comparison after procedure.</p> <p>*Determines need for using incentive spirometer.</p> <p>* Dentures interfere with performance of procedure.</p> <p>*Reduces the transmission of microorganisms.</p> <p>* Promotes optimal lung expansion.</p> <p>* Encourage patient to reach appropriate goal.</p>
<ol style="list-style-type: none">8. For the postoperative patient try as much as possible to avoid discomfort with the treatment. Co-ordinate treatment with administration of pain relief medications. Instruct and assist the patient with splinting of incision.9. Demonstrate the technique to the patient<ol style="list-style-type: none">a. Hold or place the spirometer in an upright position. A tilted flow-oriented device requires less effort to raise the balls or disks. A volume oriented device will not function correctly unless upright.b. Demonstrate how to steady device with one hand and hold mouthpiece with the other hand.c. Instruct the patient to exhale normally	<p>* More likely to have best results in using incentive spirometry when patient has as little pain as possible.</p> <p>*Practice increases inspiratory volume, maintains alveolar ventilation and prevents atelectasis.</p>

<p>and then place lips securely around mouthpiece.</p> <p>d. Instruct to take a slow, deep breath to elevate the balls or cylinder and then hold the breath for 2 seconds initially increasing to 6 seconds to keep the balls or cylinder elevated if possible.</p> <p>e. Instruct patient not to breathe through his or her nose. Use a nose clip if necessary.</p> <p>f. Tell patient to remove lips from mouthpiece and exhale normally.</p> <p>10. Instruct patient to relax and repeat procedure several times and then four or five times hourly</p> <p>11. Instruct patient to cough after the procedure.</p> <p>12. Clean the mouthpiece with water and shake it dry. Change disposable mouthpieces every 24hours.</p> <p>13. Record lung volume in cubic centimeters. Respiratory assessment (rate and depth of respiration, the amount of secretions expectorated.)</p>	<p>Provides enough strength for each repeat procedure and this will give best results.</p> <p>Deep ventilation can loosen secretions and coughing can facilitate removal.</p> <p>Prevents transmission of microorganisms.</p> <p>Acts as a communication between staff members.</p>
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Special Consideration

Patient should take several normal breaths before attempting another one with the incentive spirometer. Usually one incentive breath per minute minimizes patient fatigue. No more than four or five maneuvers should be performed per minute to minimize hypocarbia.

Summary of study session 5

In this study session, you have learnt that:

1. Incentive spirometry means assisting the patient for voluntary deep breathing by providing visual feedback about inspiratory volume by using a specially designed apparatus called spirometer.
2. The following are the reasons for incentive spirometry i.e Purposes
 - i. To improve pulmonary ventilation.
 - ii. To counteract the effects of anesthesia or hypoventilation.
 - iii. To loosen respiratory secretions

3. Types of incentive spirometer are
 - i. Volume-oriented spirometers
 - ii. Flow-oriented spirometers

Self-Assessment Questions (SAQs)

Now that you have completed this study, you can assess how well you have achieved its Learning outcomes by answering the following questions. Write your answers in your study Diary and discuss them with your Tutor at the next! Support meeting.

SAQ 5.1

Explain incentive spirometry.

State the reasons for incentive spirometry

SAQ 5.2

Mention and explain types of incentive spirometry

SAQ 5.3

Explain the action and rationale behind the step by step technique of incentive spirometry

References

Fundamentals of Nursing

Medical&Surgical Nursing-Assessment and Management of Clinical problems.

Brunner & Suddarth Medical&Surgical Nursing.

Study Session 6: Performing Chest Physiotherapy

Expected duration: 1 week or 2 contact hour

Introduction

Chest Physiotherapy is a technique used to loose secretions in the lungs and the respiratory tract.

This study session will provide you with details on chest physiotherapy, the reasons for chest physiotherapy, the type of clients who needs chest physiotherapy, those clients who cannot have chest physiotherapy, the process of chest physiotherapy, the required articles needed and the step-by-step technique of chest physiotherapy.

The Paediatric considerations for chest physiotherapy will be discussed as well.

Learning Outcomes for Study Session 6

At the end of this study session, you should be able to:

- 6.1 Define the term chest physiotherapy.
- 6.2 State the process of chest physiotherapy
- 6.3 State the step-by-step technique of chest physiotherapy.

6.1 chest physiotherapy

Chest physiotherapy is defined as a method of facilitating respiratory function by removing thick, tenacious secretions from the respiratory system us techniques of percussion, vibration and postural drainage

Why is Chest Physiotherapy necessary i.e. Purpose/Reasons

The following are the purpose/reasons for chest physiotherapy

- I. To remove tenacious secretions from bronchial walls in conditions like bronchiectasis and chronic bronchitis.
- II. To standardize the use of chest physiotherapy as a form of therapy using one or more techniques to optimize the effects of gravity and external manipulation of the thorax by postural drainage, percussion, vibration and cough. A mechanical percussor may also be used to transmit vibrations to lung tissues.

The clients that require chest physiotherapy i.e. Indications includes:

1. Patients who bring out copious sputum.
2. Patients who are at risk of atelectasis.

In-text Question

One of the following is related to chest physiotherapy

- A. Spirometry
- B. Tenacious secretions
- C. Kiss of life
- D. Dialysis

In-text Answer

Answer is B, Tenacious secretions

6.1.1 The clients who cannot have a chest physiotherapy i.e. Contraindications includes:

1. Undrained lung abscess
2. Lung tumor
3. Pneumothorax
4. Diseases of chest wall
5. Lung hemorrhage/hemoptysis
6. Painful chest condition, e.g. pleural effusion
7. Tuberculosis
8. Osteoporosis
9. Increased intracranial pressure
10. Spinal injuries.

6.2 The process of chest physiotherapy

The process of chest physiotherapy involves the following:

1. **Postural drainage:** is the drainage by gravity of secretions from various lung segments. (Refer to Study Session 4)
2. **Chest Percussion:** is the forceful striking of the skin with cupped hands and it is sometimes called **clapping**.

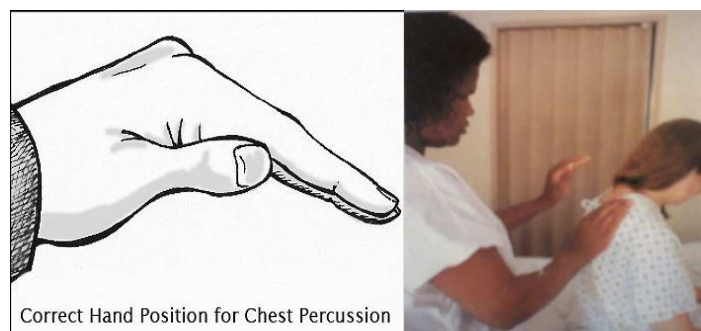


Figure 6.1: Correct hand position for chest percussion
Source: GOOGLE PICTURE







3. **Vibration:** is a series of vigorous quivering produced by hands that are placed flat against the chest wall. It is used after percussion to increase the turbulence of the exhaled air and thus loosen thick secretions.



Figure 6.2: Correct hand position for vibration
Source: GOOGLE PICTURE

4. **Coughing:** is an effective technique to clear secretions with less likelihood of bronchial collapse.

Articles Needed

Articles	Image
Pillows	
Sputum cup with disinfectant	
Paper tissues	
Adjustable bed	
Kidney tray	
Stethoscope	

In-text Question

..... is the also referred as clapping

- A. Postural drainage
- B. Spirometer
- C. Chest percussion
- D. Coughing

In-text Answer

Answer is C, Chest percussion

6.3 Step-By-Step Technique of Chest Physiotherapy

The table below explains the steps to follow in chest physiotherapy, and the rationale for each steps.

Action	Rationale
<p>1. Identify patient and check instruction of physician and nursing care plan.</p> <p>2. Explain procedure to patient and check time of last meal.</p>	<p>* Ensures that right procedure is done on the right patient.</p> <p>* Reassures patient and promotes co-operation. Postural drainage should be avoided immediately after meal times as it can induce vomiting.</p>
<p>2 Wash hands and dry.</p> <p>3 Instruct patient to perform diaphragmatic breathing.</p> <p>a. Client should place one hand on the abdomen (just below the ribs) and the other hand on the middle of the chest to increase the awareness of the position of the diaphragm and its function in breathing.</p> <p>b. Client should breathe in slowly and deeply through the nose, letting the abdomen protrude as far as possible.</p> <p>c. Client should breathe out through pursed lips while contracting the abdominal muscles.</p> <p>d. Client should press firmly inward and upward on the abdomen while breathing out.</p> <p>e. Client should repeat for 1 minute; follow with a rest period of 2 minutes.</p> <p>f. Client should gradually increase duration up to 5 minutes, several times a day (before meals and at bedtime).</p> <p>4 Position patient in prescribed postural drainage position, after consulting with physician (refer postural drainage procedure).</p> <p>5 Cover area with towel</p>	<p>*Reduces transmission of microorganisms.</p> <p>* This method of breathing helps patient to relax and widens airways and also strengthen the diaphragm during breathing</p> <p>* Position should be selected according to the area of lung that is to be drained.</p> <p>* Reduces discomfort to patient.</p>
<p>7. Percussion</p>	<p>* Percussion helps in dislodging</p>

<p>Clap with cupped hands over chest wall for 1 to 2 minutes in each lung area. Percuss from</p> <ol style="list-style-type: none"> a. Lower ribs to shoulder on the back b. Lower ribs to top of chest in front Avoid clapping over spine, liver, kidney, spleen, breast, clavicle or sternum. <p>8. Vibration Remove towel and place hand, palm down on chest area to be drained with one hand over the other and fingers together or place hands side by side.</p> <p>9. Instruct patient to inhale deeply and exhale slowly through pursed lips and perform abdominal breathing.</p> <p>10. Tense all the muscles of hand and arm and vibrate the hand especially heels with moderate pressure during exhalation.</p>	<p>mucous plugs and mobilizes secretions into main stem bronchi and trachea. The air trapped under cupped hand sets up vibration through chest wall freeing secretions. Percussion over these areas may cause injuries.</p> <p>* Vibration frees the mucus from bronchial walls.</p>
<p>11. Stop vibration and relieve pressure on inspiration.</p> <p>12. Vibrate for 5 exhalations over each lung area which is affected. After 3 - 4 vibrations, encourage patient to cough/huff and expectorate sputum into sputum cup.</p> <ol style="list-style-type: none"> a. Client should assume a sitting position and bend slightly forward, this permits a stronger cough. b. Flex your knees and hips to promote relaxation and reduce the strain on the abdominal muscles while coughing. c. Inhale slowly through the nose and exhale through pursed lips several times. d. Cough twice during each exhalation while contracting (pulling in) the abdomen sharply with each cough. e. Splint the incisional area, if any, with firm hand pressure or support it with a pillow or rolled blanket while coughing (you can initially demonstrate this by using the patient's hands). 	<p>* Pressure applied to chest wall inhibits chest expansion during inspiration.</p> <p>* Coughing or huffing aids in the movement and expulsion of secretion from the respiratory tract.</p>

<p>14. Allow patient to rest for several minutes.</p> <p>15. Auscultate with stethoscope for change in breath sounds.</p> <p>16. Repeat percussion and vibration cycles according to patient's tolerance and clinical condition, usually for 10-15 minutes.</p> <p>16. Wash hands.</p> <p>17. Assist patient to comfortable position.</p> <p>18. Assist with oral hygiene.</p> <p>19. Record procedure and patient's response in nurse's record.</p>	<p>* Presence of crackles/ rhonchi indicates mucous in bronchi.</p> <p>This will give best results.</p> <p>* Reduces risk of transfer of microorganisms. This will provide safety and comfort.</p> <p>* Promotes comfort by removing the bad taste of sputum in the mouth.</p> <p>* Enables communication between staff members.</p>
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Check the link for a video of chest physiotherapy <http://www.youtube.com/watch?v=ErMTXJLE5es>

Special Considerations

1. Perform chest physiotherapy one hour before meals or 1 -3 hours after meals.
2. Administer bronchodilator /Metered dose inhaler if ordered or nebulize 15 minutes before procedure.
3. Observe patient during treatment for tolerance-like breathing pattern cyanosis, etc.
4. Splint incision area, so that pain is tolerable. Administer pain medications if ordered, 15 to 20 minutes before procedure.
5. Stop procedure if there is tachycardia; fall in BP, palpitation, dyspnea or chest pain which indicates hypoxia

Paediatric Variations

1. For infants, a soft circular mask or a percussion cup is used for percussing small areas.
2. A popping, hollow sound should be the result and not a slapping sound.
3. The procedure is done over the rib cage only and should be painless.

Activity 6.1

Test your knowledge of Chest Physiotherapy by discussing with a colleague.

Summary of study session 6

In this study session, you have learnt that:

1. Chest physiotherapy is defined as a method of facilitating respiratory function by removing thick, tenacious secretions from the respiratory system using techniques of percussion, vibration and postural drainage.

2. The clients that require chest physiotherapy i.e. Indications includes:
 - a. Patients who bring out copious sputum.
 - b. Patients who are at risk of atelectasis.

3. The process of chest physiotherapy includes:
 - Postural drainage
 - Chest Percussion
 - Vibration
 - Coughing

Self-Assessment Questions (SAQs)

Now that you have completed this study, you can assess how well you have achieved its Learning outcomes by answering the following questions. Write your answers in your study Diary and discuss them with your Tutor at the next! Support meeting.

SAQ 6.1

Explain chest physiotherapy.

What are the reasons for chest physiotherapy?

SAQ 6.2

List and explain the process involved in chest physiotherapy

SAQ 6.3

Explain the step by step technique involved in chest physiotherapy

References

1. Fundamentals of Nursing
2. Medical&Surgical Nursing-Assessment and Management of Clinical problems.
3. Brunner & Suddarth Medical&Surgical Nursing.
4. <http://www.youtube.com/watch?v=ErMTXJLE5es>

Study Session 7: Oxygenation I & II

Expected duration: 1 week or 2 contact hour

Introduction

Oxygenation or Oxygen therapy is frequently used in the treatment of respiratory problems associated with hypoxemia. Oxygen is a colourless, odourless, tasteless gas that makes up 21% of atmosphere.

The goal of this therapy is to provide adequate transport of oxygen for proper functioning of all living cells, otherwise the absence of oxygen leads to cellular, tissue and organism death. It is a non-invasive therapy used in respiratory problems.

This study session will discuss oxygenation I and II which includes the purpose of oxygen therapy, the indications of oxygen therapy and the definition of some terms, the parts of a cylinder and the various methods of oxygen administration.

Learning Outcomes for Study session 7

At the end of this session, you should be able to:

- 7.1 Define Oxygenation or Oxygen therapy.
- 7.2 Define various terminologies.
- 7.3 Identify the Various Methods of Oxygen Administration

7.1 Oxygenation

Oxygenation or Oxygen therapy is the administration of oxygen at a concentration that increases the partial pressure of oxygen in inspired air.

Why is Oxygen Therapy Necessary i.e. Purpose

The oxygen therapy is necessary because of the following:

1. To relieve dyspnea.
2. To maintain the partial pressure of oxygen
3. To reduce the workload on the heart.
2. To administer low concentration of oxygen to patients.
3. To allow uninterrupted supply of oxygen during activities like eating, drinking, etc.

In-text Question

Provide one reason why oxygen is necessary to you?

In-text Answer

Oxygen is necessary to me because it supplies 90% of energy and only 10% emanates from food and water

7. 1.1 The Clients who will need Oxygen Therapy i.e. Indications

- Patients with Pneumonia
- Patients who had severe hemorrhage
- Patients in Shock
- Patients with severe anemia

- Patients who had cardiac failure
- Patients climbing high altitudes

In-text Question

Oxygen can be used for patient that suffer one of these sickness

- A. Respiratory Distress Syndrome
- B. Catarrh
- C. Botulism
- D. Herpes

In-text Answer

The answer is A

7.2 Definition of Terminologies

- Eupnoea: normal respiration
- Tachypnea abnormally high respirations.
- Bradypnea: abnormally slow respirations.
- Apnea: a complete absence of respirations
- Orthopnea: ability to breathe only in an upright position.
- Dyspnea: difficult or labored breathing.
- Hypoxia: insufficient oxygen in the body.
- Hypercapnia or Hypercarbia: accumulation of carbon dioxide in the blood.
- Cyanosis: a bluish tinge of skin color

The Parts of an Oxygen Cylinder are as follows:

- Humidifier: a calibrated container filled with water to prevent administration of dry oxygen.
- Flow meter: a calibrated that states the litre of administered oxygen.
- Control valve/ Regulator: acts as the on/off knob for administering oxygen.
- Gauge: states the amount of oxygen in the cylinder.

7.3 The Various Methods of Oxygen Administration

The various methods of oxygen administration are as follows:

1. Nasal cannula or catheter or nasal prongs
2. Face mask which includes Simple face mask, Partial and Non-breathing masks, and Ventura masks.
3. Oxygen tent
4. Ox hood
5. Oxygen conserving cannula
6. Oxygen panel
7. Oxygen concentrator
8. Tracheostomy collar
9. Tracheostomy T Bar

The various methods of oxygen therapy can be classified into

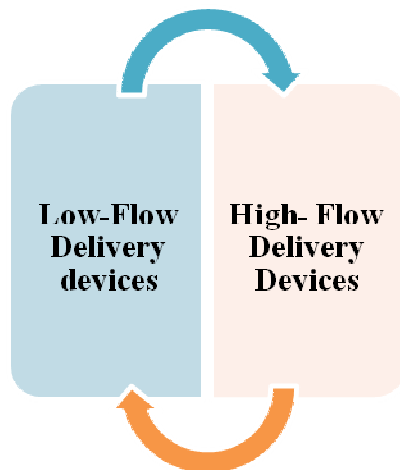


Figure 7.1: Classification of Methods of Oxygen Therapy

1. Low-Flow Delivery Devices

Low-flow systems contribute partially to the inspired gas the patient breathes, which means that the patient breathes some room air along with the oxygen. These systems do not provide a constant or known concentration of inspired oxygen.

The amount of inspired oxygen changes as the patient's breathing changes. Examples include nasal cannula, or pharyngeal catheter, simple mask, partial-rebreather, and non-rebreathed masks.

2. High-Flow Delivery Devices

High-flow systems provide the total inspired air. A specific percentage of oxygen is delivered independent of the patient's breathing. High-flow systems are indicated for patients who require a constant and precise amount of oxygen.

Examples include trans-tracheal catheters, Ventura masks, aerosol masks, tracheostomy collars, T-pieces, and face tents.

Table 7.1: Methods of Oxygen Administration and the Percentages

Device	Suggested Flow Rate (L/min)	O ₂ Percentage Setting	Advantages	Disadvantages
Low-Flow Systems				
Cannula	1-2	23-30	Lightweight, comfortable, inexpensive, continuous use with meals and activity	Nasal mucosal drying, variable FiO ₂
	3-5	30-40		
	6	42		
Oropharyngeal catheter	1-6	23-42	Inexpensive, does not require a tracheostomy	Nasal mucosa irritation; catheter should be changed frequently to alternate nostril
Mask, simple	6-8	40-60	Simple to use, inexpensive	Poor fitting, variable FiO ₂ , must remove to eat
Mask, partial rebreather	8-11	50-75	Moderate O ₂ concentration	Warm, poorly fitting, must remove to eat
Mask, non-rebreather	12	80-100	High O ₂ concentration	Poorly fitting, must remove to eat
High-Flow Systems				
Transtracheal catheter	¼-4	60-100	More comfortable, concealed by clothing, less oxygen liters per minute needed than nasal cannula	Requires frequent and regular cleaning, requires surgical intervention
Mask, Venturi	4-6	24, 26, 28	Provides low levels of supplemental O ₂	Must remove to eat
	6-8	30, 35, 40	Precise FiO ₂ , additional humidity available	
Mask, aerosol	8-10	30-100	Good humidity, accurate FiO ₂	Uncomfortable for some
Tracheostomy collar	8-10	30-100	Good humidity, comfortable, fairly accurate FiO ₂	
T-piece	8-10	30-100	Same as tracheostomy collar	Heavy with tubing
Face tent	8-10	30-100	Good humidity, fairly accurate FiO ₂	Bulky and cumbersome
Oxygen Conserving Devices				
Pulse dose (or demand)	10-40 mL/breath		Deliver O ₂ only on inspiration, conserve 50% to 75% of O ₂ used	Must carefully evaluate function individually

A. NASAL CANNULA

This is a method by which oxygen is administered in low concentration through a cannula which is a disposable device with two protruding prongs for insertion into the nostrils. Below is an image example of Nasal Cannula.

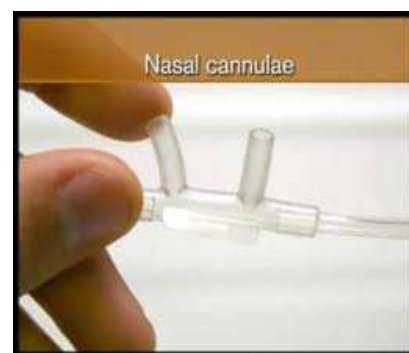


Figure 7.2: Image showing Nasal Cannula

Purposes

- ❖ To relieve dyspnea
- ❖ To administer low concentration of oxygen.
- ❖ To allow uninterrupted supply of oxygen during activities like eating, drinking, etc.

Articles

1. Oxygen source
2. Nasal cannula with connecting tubes
3. Humidifier with distilled water
4. Flow meter
5. Gauze pads
6. “No smoking” signs.

In-text Question

Why can Nasal Cannula be used for?

In-text Answer

It is used to deliver oxygen when a low flow of oxygen is required

Step by Step Technique

Action	Rationale
<ol style="list-style-type: none">1. Determine need for oxygen therapy in patient. Check physician’s order for rate, device used concentration, etc.2. Perform an assessment of vital signs, level of consciousness, lab values, etc. and record.3. Assess risk factors of oxygen therapy in patient and environment such as patients with hypoxia drive, faulty electrical connection, etc.	<ul style="list-style-type: none">* Reduces risk of error in administration.* Provides a baseline for future assessment.* Reduces risk of danger to the patient
<ol style="list-style-type: none">4. Explain procedure to patient and relatives and inform them how to cooperate.5. Post” no smoking” sign on the patient’s door in view of patient and visitors and explain to them the dangers of smoking when oxygen is on flow6. Wash hands7. Set up oxygen equipment and humidifier<ol style="list-style-type: none">a. Fill humidifier up to the level marked on it with sterile waterb. Attach flow meter to source, set flow meter in ‘off’ position	<ul style="list-style-type: none">* Reduces anxiety and ensures cooperation* Oxygen supports combustion; smoking in oxygen area can lead to fire hazards.* Reduces risk of transmission of microorganisms.* Filling beyond this point will cause water to enter tubing.* Flow meter helps in monitoring and regulating oxygen flow to patient.

<p>c. Attach humidifier to base of flow meter</p> <p>d. Attach tubing and nasal cannula to humidifier</p> <p>e. Regulate flow meter to prescribed level.</p> <p>f. Ensure proper functioning by checking for bubbles in humidifier or feeling oxygen at the outlet.</p> <p>8. Place tips of cannula to patient's nares and adjust straps around ear for snug fit. The elastic band may be fixed behind head or under chin.</p>	<p>* Humidification helps in preventing drying of mucous membranes and promotes comfort of patient.</p> <p>* Oxygen is a drug and is dangerous to administer at flow rates greater or lesser than prescribed level.</p> <p>* Kinks in the tubing will obstruct flow of oxygen through tube.</p> <p>* Proper fixing ensures comfort and prevents chances of cannula slipping from nostrils.</p>
<p>9. Pad tubing with gauze pads over ear and inspect skin behind ear periodically for irritation/breakdown</p> <p>10. Inspect patient and equipment frequently for flow rate, clinical condition, level of water in humidifier, etc.</p> <p>11. Ensure that safety precautions are followed.</p> <p>12. Wash hands</p> <p>13. Document time, flow rate and observations made on patient.</p> <p>14. Encourage patient to breathe through his/her nose with mouth closed</p> <p>15. Remove and clean the cannula with soap and water, dry and replace every 8 hours. Assess nares at least every 8 hours.</p>	<p>* Constant pressure may cause skin breakdown</p> <p>* Helps in identifying any complications that may arise.</p> <p>* Provides for optimal delivery of oxygen to patient</p> <p>* Presence of cannula causes irritation and dryness of the mucous membrane.</p>

Special Precautions

1. Never deliver more than 2-3 liters of oxygen to patients with chronic lung disease, e.g. COPD.
 2. Check frequently that both prongs are in patient's nares.
- * Oxygen concentration will vary on many factors like patient's tidal volume and ventilatory pattern.

A. FACEMASK

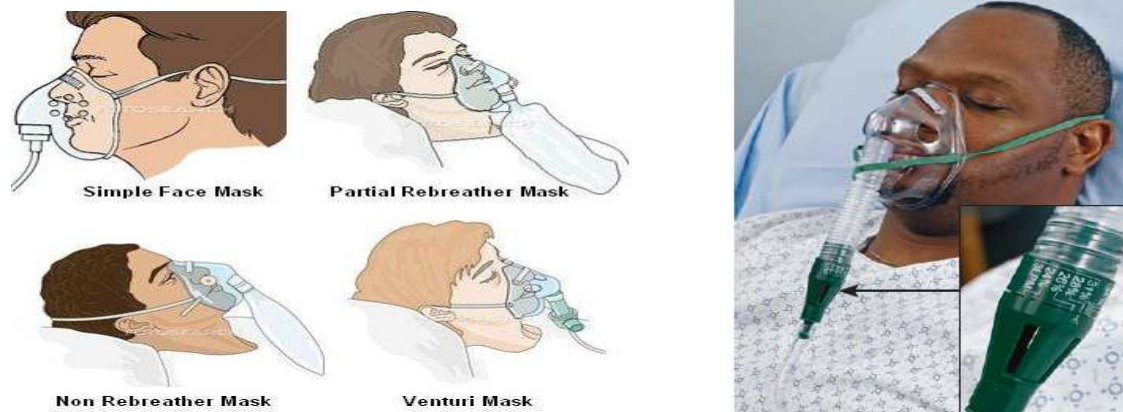


Figure 7.3: Image Example Showing Facemask

Purposes

- ❖ To relieve dyspnea
- ❖ To administer higher concentration of oxygen.

Articles

1. Oxygen source
2. Mask (simple/or with venturi adaptor high flow device of appropriate size)
3. Humidifier with distilled water
4. Flow meter
5. Gauze pieces
6. “No smoking” signs.

Step by Step Technique

Action	Rationale
<ol style="list-style-type: none"> 1. Determine need for oxygen therapy in patient. Check physician’s order for rate, device used concentration, etc. 2. Perform an assessment of vital signs, level of consciousness, lab values, etc. and record. 3. Assess risk factors of oxygen therapy in patient and environment such as patients with hypoxia drive, faulty electrical connection, etc. 	<ul style="list-style-type: none"> * Reduces risk of error in administration. * Provides a baseline for future assessment. * Reduces risk of danger to the patient. Oxygen is a combustible gas. Hypoxic drive in patients is essential for maintaining respiration.
<ol style="list-style-type: none"> 4. Explain procedure to patient and relatives and inform them how to 	<ul style="list-style-type: none"> * Reduces anxiety and ensures cooperation

<p>cooperate.</p> <p>5. Post” no smoking” sign on the patient’s door in view of patient and visitors and explain to them the dangers of smoking when oxygen is on flow</p> <p>6. Wash hands</p> <p>7. Set up oxygen equipment and humidifier</p> <ol style="list-style-type: none"> Fill humidifier up to the level marked on it with sterile water Attach flow meter to source, set flow meter in ‘off’ position Attach humidifier to base of flow meter Attach tubing and face mask to humidifier (if venture device is used, attach color coded venture adapter to masks as appropriate) Regulate flow meter to prescribed level. <p>8. Guide mask to patient’s faced and apply it from the nose downward. Fit the metal piece of mask to conform to shape of the nose.</p>	<ul style="list-style-type: none"> * Oxygen supports combustion; smoking in oxygen area can lead to fire hazards. * Reduces risk of transmission of microorganisms. * Filling beyond this point will cause water to enter tubing. * Flow meter helps in monitoring and regulating oxygen flow to patient. * Humidification helps in preventing drying of mucous membranes and promotes comfort of patient. * Oxygen is a drug and is dangerous to administer at flow rates greater or lesser than prescribed level. * The mask should mold to face so that very little oxygen escapes into eyes or around the cheeks or chin
<p>9. Secure elastic band around patients’ head.</p> <p>10. Apply padding behind ears as well as scalp where elastic band passes.</p> <p>11. Ensure that safety precautions are followed.</p> <p>12. Inspect patient and equipment frequently for flow rate, clinical condition, level of water in humidifier, etc.</p> <p>13. Wash hands</p> <p>14. Remove the mask and dry the skin every 2-3hours if oxygen is administered</p>	<ul style="list-style-type: none"> * Ensure comfort of the patient. Padding prevents irritation to skin around area. * Helps in identifying any complications that may arise. Reduces the risk of transmission of microorganisms. * The tight fitting mask and moisture

continuously. Do not put powder around the mask.

15. Document relevant data in patient's record.

from condensation can irritate the skin on the face. There is danger of inhaling powder if it is placed around,

Special Precautions

1. The dosage of oxygen may be ordered as an FIO₂ (fraction of inspired oxygen which is expressed as percentage or as liters per minute).
2. . The venture mask will have color coded inserts that list the flow rate necessary to obtain the desired percentage oxygen.

B. OXYGEN CONSERVING CANNULA

Oxygen-conserving devices include trans-tracheal catheters, reservoir cannulas, and demand oxygen delivery systems. They are designed to extend the amount of time portable oxygen cylinders will last and correct hypoxemia with a lower flow of oxygen.



Figure 7.4: Example of Oxygen Conserving Cannula

C. OXYGEN PANEL

Oxygen control panel allow patient oxygen levels to be adjusted from the control room and eliminates the need to intrude into the patient room to adjust the oxygen flow rate, possibly disturbing the patients sleep.



Figure 7.5: Example of Oxygen Panel

D. OXYGEN CONCENTRATOR

An oxygen concentrator is a medical device used to deliver oxygen to those who require it.



Figure 7.6: Example of Oxygen Concentrator

D. TRACHEOSTOMY T-BAR

Tracheostomy tubes are used to administer positive-pressure ventilation, to provide a patent air and are important for clinicians caring for patients with a tracheostomy.

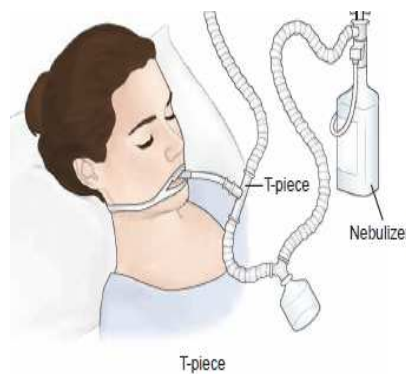


Figure 7.7: Example of Tracheostomy -Bar

E. TRACHEOSTOMY COLLAR.



Figure 7.8: Example of Tracheostomy Collar

Summary of Study Session 7

In this study session, you have learnt that:

1. Oxygenation is the process of treating patients with oxygen. Oxygen therapy is vital because it helps to relieve dyspnoea, reduce workload from the patient heart and to allow uninterrupted supply of oxygen.
2. Patients that need oxygen are people that suffered cardiac failure, pneumonia, shock and severe anaemia.
3. The parts of oxygen cylinder are as follows;
 - ❖ Humidifier: a calibrated container filled with water to prevent administration of dry oxygen.
 - ❖ Flow meter: a calibrated that states the litre of administered oxygen.
 - ❖ Control valve/ Regulator: acts as the on/off knob for administering oxygen.
 - ❖ Gauge: states the amount of oxygen in the cylinder.
4. The various method of oxygen administration is listed in and explained in 7.3 above.

Self-Assessment Questions (SAQs) for Study Session 7

After you have completed reviewing this study session, you can assess how well you have achieved its Learning Outcomes by answering the questions below. Write your answers in Study Diary and discuss them with your Tutor at the next Contact Session

SAQs 7.1 (tests learning outcomes 7.1)

A client in the Intensive Care Unit is experiencing an alteration in pulmonary gas exchanged caused by impaired ventilation. Which of the following could be reason for impaired ventilation?

- A. Atelectasis
- B. Pulmonary Embolism
- C. Diagnosis of cervical cord Injury
- D. Anaemia

SAQs 7.2 (tests learning outcomes 7.2)

The nurse is planning to directly assess a client's oxygen consumption. Which of the following methods will be used for the assessments?

- A. utilize pulse oximetry
- B. Evaluate serum lactate level
- C. Perform arterial blood gas analysis
- D. Rethink the method

SAQs 7.3 (tests learning outcomes 7.3)

If a patient is supposed to receive as much O₂ as possible without being intubated, which face mask should be used?

- A. Venturi mask
- B. Face tent
- C. Partial rebreather
- D. Non rebreather

Notes ON SAQs

1. Pulmonary Embolism
2. C
3. Face tent

Study Session 8: OXYGENATION III

Expected duration: 1 week or 2 contact hour

Introduction

This teaching session is a continuation of the previous session. It will teach you about one of the methods of oxygen administration.

This study session will focus on administration of oxygen by tent and the step by step procedure to administration of oxygen via tent.

Learning Outcome for Study Session 8

At the end of this session, you should be able to:

- 8.1 State the methods of oxygen administration via the oxygen tent.
- 8.2 Explain the step by step Technique of Oxygen Therapy through Tent

8.1 Administration of Oxygen by Tent

The process of administering is usually done for infants to give maximum comfort and most satisfactory results

Description

It consists of a canopy over the baby's bed that may cover the baby fully or partially and is connected to a supply of oxygen. The canopies are transparent and enable the nurse to observe the sick baby. Below is the example of oxygen by tent.



Figure 8.1: Oxygen Tent

Advantages

1. Provides an environment for the patient with controlled oxygen concentration, temperature regulation and humidity control.
2. It allows freedom of movement in bed.

Disadvantages

1. It creates a feeling of isolation
2. It requires high level of oxygen(10-12litre per minute)
3. Loss of desired concentration occurs each time the tent is opened to provide care for the infant.
4. There is an increased chance of hazards due to fire.
5. It requires much time and effort to clean and maintain a tent.

In-text Question

Infant respiratory distress syndrome is caused by any of the following?

- A. Lack of Alveoli
- B. Lamella
- C. Surfactant
- D. Hyaline in membrane

In-text Answer

The answer is C

Articles

Oxygen tent and oxygen source, humidifier.

8.2 Step-by-Step Technique of Oxygen Therapy via Tent

The step by step techniques of oxygen therapy through tent are listed in table 9.1 below:

Table 8.1: Step by Step Techniques of Oxygen Therapy through Tent

Action	Rationale
1. Explain and reassure the parents and child.	* Helps in obtaining cooperation.
2. Select the smallest tent and canopy that will achieve the desired concentration of oxygen and maintain patient comfort	*Increases the efficiency of the unit.
3. Tuck the edges of the tent under the mattress securely. This is especially important if the child is restless and can dislodge the tent by pulling the covers loose..	*Dislodgement of tent leads to oxygen leakage.
4. Pad the metal frame that supports the canopy.	* Protects the child from injury.
5. Flush the tent with oxygen (increase the flow rate) after it has been opened for a period of time to increase the concentration of the gas, and then reset the flow meter to	Oxygen is circulated in the tent to adjust the concentration * Concentration varies with the

<p>the original.</p> <p>6. Analyze and record the tent atmosphere every 1-2 hours. Concentrations of 30-50% can be achieved in well-maintained tents.</p> <p>7. Maintain a tight fitting canopy whenever possible; provide nursing care through the sleeves or pockets of the tent.</p> <p>8. Check child's temperature routinely.</p> <p>9. 'No smoking' sign should be pasted in the unit.</p> <p>10. Record the flow rate of oxygen, alteration in flow rate and child's reaction,</p>	<p>efficiency of the tent, the rate of flow of oxygen and the frequency with which the tent is opened to the outside environment.</p> <p>* Prevents oxygen leakage and disruption of the tent atmosphere.</p> <p>* Moisture accumulation may result in hypothermia</p> <p>Oxygen helps in combustion</p> <p>* Serves as a communication between staff members.</p>
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Note

1. Oxygen can be administered to babies using oxygen(oxy hood)
2. Oxygen hood is a plastic device which is kept over the head of the infant. It permits easy access to the child without loss of oxygen .It helps in efficient delivery oxygen.
3. While placing hood over the head of the child ,the edges of the hood should not rub against the child's chin, neck and shoulders,



Figure 8.2: Image Example of Oxy hood

8.2.1 Special Considerations

1. Mist is prescribed with oxygen therapy to liquefy secretions
2. Humidified air may condense into water droplets inside the walls of the tent, it is important to examine the child's clothing and bedding and change them as necessary to prevent chilling.
3. Electrical equipment used within or near the tent should be grounded properly.

4. It is preferable to monitor the SPO2 of patient continuously.
5. Avoid the use of volatile, inflammable materials such as oils, grease, and alcohol. Ether and acetone near the tent.
6. Nurses should be knowledgeable about the location and technique of fire extinguisher
7. For the baby in oxygen tent, toys selected should be such that they retard absorption, are washable and will not produce static electricity. E.g. woolen and stuffed toys. This ensures baby safety.
- 8.

ACTIVITY 8.1: Oxygen Therapy

Allowed Time: 30 Minutes

Task: Try to recall all the teachings about oxygen therapy

Summary of Study Session 8

In this study, you have learnt that:

1. Administration of oxygen by tent is mainly for infant for their comfort etc. It consists of a canopy over the baby's bed that may cover the baby fully or partially and is connected to a supply of oxygen. The canopies are transparent and enable the nurse to observe the sick baby.
2. The administration involves step by step techniques which you can find at 8.2 of this section
3. Oxygen therapy by tent allows free

Self-Assessment Questions (SAQs) for Study Session 8

After you have completed reviewing this study session, you can assess how well you have achieved its Learning Outcomes by answering the questions below. Write your answers in Study Diary and discuss them with your Tutor at the next Contact Session

SAQs 8.1 (tests learning outcomes 8.1)

Which of the following equipment can be used to administer oxygen to babies?

- A. Oxyhood
- B. non-rebreather
- C.

SAQs 8.2 (tests learning outcomes 8.2)

All of these are special consideration when administering oxygen to patients EXCEPT

- A. Nurses should be knowledgeable about the location and technique of fire extinguisher
- B. Avoid the use of volatile, inflammable materials such as oils, grease, and alcohol
- C. For the baby in oxygen tent, toys selected should be such that they retard absorption
- D. you may not monitor the SPO2 of patient continuously

Notes on SAQs

1. A

2.D

REFERENCES

Fundamentals of Nursing

Medical & Surgical Nursing-Assessment and Management of Clinical problems.

Brunner & Siddhartha Medical & Surgical Nursing.

Study Session 9: Pursed Lip Breathing, Coughing and Deep Breathing Exercises.

Expected duration: 1 week or 2 contact hour

Introduction

Breathing exercises are exercises that assist the patient during rest and activity thus reducing fatigue.

This study session will focus on teaching about breathing exercises. It will help you acquire the skills to assist clients with respiratory conditions.

Learning Outcomes for Study Session 9

At the end of this session, you will be able to:

9.1 Identify the purpose of breathing exercises

9.2 Explain the various methods of breathing exercises

9.1 Why is Breathing Exercise Necessary i.e. Purpose

The process of breathing is the essence of life and it is a rhythmic process of expansion and contraction. Breathing is one consistent polarity seen in nature such as night and day, wake and sleep. This is the bodily function that you do both voluntarily and involuntarily.

Breathing is necessary because of the following reasons below;

- ❖ To decrease dyspnea
- ❖ To improve oxygenation
- ❖ To reduce respiratory rate

1. To Decrease Dyspnea

Dyspnea refers to the sensation of difficult or uncomfortable breathing. It is a subjective experience perceived and reported by an affected patient. Dyspnea on exertion (DOE) may occur normally, but is considered indicative of disease when it occurs at a level of activity that is usually well tolerated.

9.1.1 Breathing Exercises

General Instructions

- Breathe slowly and rhythmically to exhale completely and empty the lungs completely.
- Inhale through the nose to filter, humidify, and warm the air before it enters the lungs.
- If you feel out of breath, breathe more slowly by prolonging the exhalation time.
- Keep the air moist with a humidifier.

9.2 The various types of breathing exercises

The various type of breathing exercises is as follows:

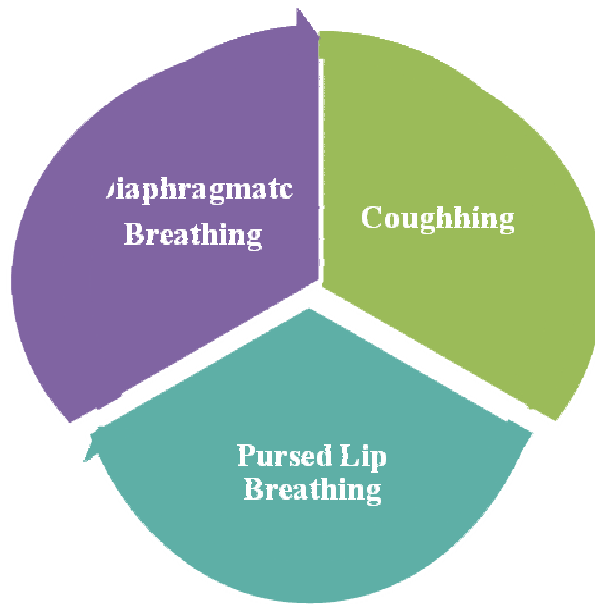


Figure 9.1: Methods of Breathing Exercises

1. Diaphragmatic Breathing

Diaphragmatic breathing, abdominal breathing, belly breathing or deep breathing is breathing that is done by contracting the diaphragm, a muscle located horizontally between the chest cavity and stomach cavity. Air enters the lungs and the belly expands during this type of breathing.

The purpose is to use and strengthen the diaphragm during breathing

- a. Place one hand on the abdomen (just below the ribs) and the other hand on the middle of the chest to increase the awareness of the position of the diaphragm and its function in breathing.
- b. Breathe in slowly and deeply through the nose, letting the abdomen protrude as far as possible.
- c. Breathe out through pursed lips while tightening (contracting) the abdominal muscles.
- d. Press firmly inward and upward on the abdomen while breathing out.
- e. Repeat for 1 minute; follow with a rest period of 2 minutes.
- f. Gradually increase duration up to 5 minutes, several times a day (before meals and at bedtime).

2. Pursed-Lip Breathing

The purpose is to prolong exhalation and increase airway pressure during expiration, thus reducing the amount of trapped air and the amount of airway resistance.

- a. Inhale through the nose while slowly counting to 3—the amount of time needed to say “Smell a rose.”
- b. Exhale slowly and evenly against pursed lips while tightening the abdominal muscles. (Pursing the lips increases intratracheal pressure; exhaling through the mouth offers less resistance to expired air.)
- c. Count to 7 slowly while prolonging expiration through pursed lips—the length of time to say “Blow out the candle.”

- d. While sitting in a chair: Fold arms over the abdomen. Inhale through the nose while counting to 3 slowly. Bend forward and exhale slowly through pursed lips while counting to 7 slowly.
- e. While walking: Inhale while walking two steps. Exhale through pursed lips while walking four or five steps

3. Coughing Technique

- a. Client should assume a sitting position and bend slightly forward, this permits a stronger cough.
- b. Flex your knees and hips to promote relaxation and reduce the strain on the abdominal muscles while coughing.
- c. Inhale slowly through the nose and exhale through pursed lips several times.
- d. Cough twice during each exhalation while contracting (pulling in) the abdomen sharply with each cough.
- e. Splint the incisional area, if any, with firm hand pressure or support it with a pillow or rolled blanket while coughing (you can initially demonstrate this by using the patient's hands

Activity 9.1: Breathing Exercise

Allowed Time: 48 Hours

Task: Identify a client with ineffective airway clearance and assist with breathing exercises

Summary of Study Session 9

In this study session, you have learnt that:

1. Breathing exercise is necessary because it helps
 - ❖ To decrease dyspnea
 - ❖ To improve oxygenation
 - ❖ To reduce respiratory rate
2. Breathing exercise has general instruction that must follow and it is located in 9.1 of this session.
3. Breathing exercise take place in three methods such as pursed-lip breathing, diaphragmatic breathing and coughing techniques. You can read it up in 9.2 of this study session.

Self-Assessment Questions (SAQs) for Study Session 9

After you have completed reviewing this study session, you can assess how well you have achieved its Learning Outcomes by answering the questions below. Write your answers in Study Diary and discuss them with your Tutor at the next Contact Session

SAQs 9.1 (tests learning outcomes 9.1)

You inhale through the nose to achieve ----- before it enters the lungs.

- A. Humidify the air
- B. Filter the Air
- C. Warm the air

D. Weak the air

SAQs 9.2 (tests learning outcomes 9.2)

The method of breathing exercise that reduces the amount of trapped air and the amount of airway resistance is -----

- A. Coughing
- B. Diaphragmatic Breathing
- C. Pursed Lip Breathing
- D. Exhalation

Notes on SAQs

- 1. D
- 2. C

REFERENCES

Fundamentals of Nursing

Medical & Surgical Nursing-Assessment and Management of Clinical problems.

Brunner & Siddhartha Medical& Surgical Nursing.

Study Session 10: Oral and Nasopharyngeal Suctioning

Introduction

Suctioning is a common nursing technique performed to remove accumulated secretions from the airway that prevents gaseous exchange.

You will learn about suctioning, how to recognize clients who needs suctioning, the purpose or reasons for suctioning and the technique of suctioning.

Learning Outcomes for Study Session 10

At the end of this session, you will be able to:

10.1 Define Suctioning

10.2 State the Purpose of Suctioning

10.5 State the Complications of Suctioning.

10.1 Suctioning

Suctioning is aspirating secretions through a catheter connected to a suction machine or wall suction outlet.

This is a sterile technique that removes secretions from the upper respiratory tract. The clients that need suctioning will have these signs shown in figure 10.1 below



Figure 10.1: Signs for Suctioning

In-text Question

One of the following is indications for suctioning?

- A. Dyspnea
- B. Cyanosis
- C. Deterioration of arterial blood gases
- D. Fever

In-text Answer

The answer is D

10.1.1 Types of suctioning

The most common types are :

- ❖ Oropharyngeal Suctioning.
- ❖ Nasopharyngeal suctioning
- ❖ Nasotracheal Suctioning
- ❖ Suctioning through an artificial airway

The portion of the airway that requires suctioning and whether or not the patient has an artificial airway determine the type of suctioning you perform.

10.2 Importance of Suctioning

Suctioning is necessary because of the following reasons/purposes

- ❖ To remove secretions that obstructs the airway
- ❖ To facilitate ventilation
- ❖ To obtain secretions for diagnostic purposes
- ❖ To prevent infection that may result from accumulated secretions

Suctioning can cause harmful effects such as the following:

1. Trauma to the mucous lining of the respiratory tract
2. Haemorrhage
3. Hypoxemia
4. Infection to the lungs(pneumonia)
5. Atelectasis
6. Cardiac arrest

Articles

1. Clean gloves
 2. Yanker suction catheter
 3. Sterile gloves
 4. Sterile suction catheter
 5. Water soluble lubricant
- } for Oropharyngeal suctioning

10.3 STEPS BY STEP TECHNIQUE.

Click the link below to see the procedure.

<http://www.youtube.com/watch?v=TwNSNodYfEw>

ACTION	RATIONALE
Assess for clinical signs indicating the need for suctioning: <ul style="list-style-type: none">• Restlessness• Gurgling sounds during respiration• Adventitious breath sounds when the chest is auscultated• Change in mental status• Skin color	Provides standard for evaluation of procedure and the need for suctioning

<ul style="list-style-type: none"> • Rate and pattern of respirations • Pulse rate and rhythm • Decreased oxygen saturation 	
Introduce yourself and verify the client's identity. Explain to the client what you are going to do, why it is necessary, and how the client can cooperate.	Ensures cooperation
Perform hand hygiene and observe other appropriate infection control procedures	Limits transfer of infection
Provide privacy	This minimizes embarrassment
Position a conscious person who has a functional gag reflex in the semi-Fowler's position, with head turned to one side for oral suctioning or with neck hyperextended for nasal Suctioning. Position an unconscious client in the Lateral position, facing you.	This prevents aspiration
Place the towel or moisture-resistant Pad over the pillow or under chin.	The bed line is protected from moisture
Set the pressure on the suction gauge, and turn on the suction.	This ensures age and condition of client is taken into consideration
<p>Open the lubricant (if performing Nasopharyngeal suctioning).</p> <p>For oral and Oropharyngeal suction:</p> <p>Moisten the tip of the Yankauer suction catheter with the sterile water or saline.</p> <p>Pull tongue forward, if necessary, Using gauze.</p> <p>Do not apply suction (leave your finger off the port) during the insertion.</p> <p>Advance the catheter about 10–15 cm (4–6 inches) along one side of the mouth into the oropharynx.</p> <p>It may be necessary during or pharyngeal suctioning to apply suction to secretions that collect in the vestibule of the mouth and beneath the tongue.</p> <p>For nasopharyngeal and</p>	This action reduces bruising of mucus membrane

<p>Nasotracheal suction: Open the lubricant, if performing Nasopharyngeal /Nasotracheal suctioning. Open the sterile suction package: Set up the cup or container, touching only the outside. Pour sterile water or saline into the container. Put on the sterile gloves, or put a non-sterile glove on the no dominant hand and then a sterile glove on the Dominant hand. With your sterile-gloved hand, pick up the catheter, and attach it to the suction unit.</p>	
<p>Make an approximate measure of the depth for the insertion of the catheter, and test the equipment. Measure the distance between the tip of the client's nose and the earlobe. Mark the position on the tube with the fingers of the sterile-gloved hand. Test the pressure of the suction and the patency of the catheter by applying your sterile-gloved finger or thumb to the port or open branch of the Y-connector (the suction control) to create suction. If needed, increase supplemental oxygen. 7. Lubricate and introduce the catheter. Lubricate the catheter tip with sterile water, saline, or water-soluble Lubricant. Remove oxygen with your No dominant hand, if appropriate.</p>	<p>Approximating the depth ensures that the mucus is properly cleared.</p>

<p>Without applying suction, insert the catheter the premeasured or recommended distance into either naris, and advance it along the floor of the nasal cavity.</p> <p>Never force the catheter against the obstruction. If one nostril is obstructed, try the other.</p>	
<p>8. Perform suctioning.</p> <p>Apply your finger to the suction control port to start suction, and gently rotate the catheter.</p> <p>Apply suction for 5–10 seconds while slowly withdrawing the catheter, then remove your finger from the control and remove the catheter.</p>	
<p>A suction attempt should last only 10–15 seconds. During this time, the catheter is inserted, the suction applied and discontinued, and the Catheter removed.</p>	

<p>9. Rinse the catheter, and repeat suctioning as above. Rinse and flush the catheter and tubing with sterile water or saline. Rubricate the catheter, and repeat suctioning until the air passage is clear. Allow sufficient time between each Suction, and limit suctioning to 5minutes in total. Encourage the client to breathe deeply and to cough between suctionings.</p>	
<p>Obtain a specimen, if required. Use a sputum trap as follows: Attach the suction catheter to the tubing of the sputum trap. Attach the suction tubing to the sputum trap air vent. Suction the client. The sputum trap will collect the mucus during suctioning. Remove the catheter from the client. Disconnect the sputum trap tubing from the suction catheter. Remove the suction tubing from the trap air vent. Connect the tubing of the sputum trap to the air vent. Connect the suction catheter to the tubing. Flush the catheter to remove secretions from the tubing.</p> <p>11. Promote client comfort. Offer to assist the client with oral or nasal hygiene. Assist the client to a position that facilitates breathing.</p> <p>12. Dispose of equipment and ensure availability for the next suction. Dispose of the catheter, gloves, water,</p>	

<p>and waste container. Wrap the catheter around your sterile-gloved hand and hold the catheter as the glove is removed over it for disposal.</p> <p>Rinse the suction tubing as needed by Inserting the end of the tubing into the used water container. Empty and rinse the suction collection container as needed or indicated by protocol.</p> <p>Change the suction tubing and container daily</p>	
<p>Ensure that supplies are available for the next suctioning.</p> <p>13. Assess the effectiveness of suctioning.</p> <p>Auscultate the client’s breath sounds to ensure they are clear of secretions. Observe skin color, dyspnea, level of anxiety, and oxygen saturation levels.</p> <p>14. Document relevant data.</p> <p>Record:</p> <ul style="list-style-type: none"> • The amount, consistency, color, and odor of sputum. • The client’s breathing status before and after the procedure. • Frequency of suctioning must be recorded. 	

Summary of Study Session 10

In this study session, you have learnt that:

1. Suctioning is the removal of mucus or fluids from a child that he or she is unable to cough up, which may block air passages.
2. Clients that need suctioning are patients that suffer dyspnea, decreases SPO2 level and cyanosis
 - ❖ 3. types of suctioning are as follows:
 - ❖ Oropharyngeal Suctioning.
 - ❖ Nasopharyngeal suctioning
 - ❖ Nasotracheal Suctioning
 - ❖ Suctioning through an artificial airway
3. The importance of Suctioning and the step by step techniques are found in 10.2 and 10.3 of this study session.

Self-Assessment Questions (SAQs) for Study Session 10

After you have completed reviewing this study session, you can assess how well you have achieved its Learning Outcomes by answering the questions below. Write your answers in Study Diary and discuss them with your Tutor at the next Contact Session

SAQs 10.1 (tests learning outcomes 10.1)

When should suctioning be performed?

SAQs 10.2 (tests learning outcomes 10.2)

One of the following is not the effect of suctioning

- A. Stooling
- B. Hypoxemia
- C. Infection to the lungs (pneumonia)
- D. Atelectasis

Notes on SAQs

1. When there are signs of respiratory distress, inability to expectorate secretions, dyspnea, bubbling/rattling (breath sounds), ineffective cough (nothing comes up), poor skin color, decreased oxygen sat.
2. The answer A.

REFERENCES

Fundamentals of Nursing [http://www.atitesting.com/ati_next_gen/skillsmodules/content/airway management/equipment/types-of-suctioning.html](http://www.atitesting.com/ati_next_gen/skillsmodules/content/airway%20management/equipment/types-of-suctioning.html)
<http://www.youtube.com/watch?v=TwNSNodYfEw>

Study Session 11: Using Bronchodilators

Expected duration: 1 week or 2 contact hour

Introduction

In people with respiratory disorders that lead to obstruction of the airway, inhaled medicines are the first choice. They begin to work within 5 minutes and have fewer side effects. The medicine goes right to the lungs and does not easily go into the rest of the body. These medicines are called Bronchodilators.

Bronchodilator is an agent that causes widening of the air passages by relaxing bronchial smooth muscle. It allows increased oxygen distribution throughout the lungs and improving alveolar ventilation.

In this study session, you will learn about bronchodilators, the clients who need bronchodilators, the types of bronchodilators, and the method of administering bronchodilators.

Learning Outcomes for Study session 11

At the end of this session, you will be able to:

11.1 Define bronchodilators

11.2. State the types of bronchodilators

11.3 State the method of administering bronchodilators

11.1 Bronchodilators

A bronchodilator is a substance that dilates the bronchi and bronchioles, reducing resistance in the respiratory airway and increasing airflow to the lungs. Bronchodilators are either endogenous (originating naturally within the body), or exogenous i.e. they may be medications administered for the treatment of breathing difficulties. They are most helpful in obstructive lung diseases. Typical examples of these are thus:

- ❖ Asthma
- ❖ Chronic obstructive Pulmonary disease

The clients who need bronchodilators are:

- a. Patients who have Chronic Obstructive Pulmonary Disease
- b. Patients who have Asthma

11.2 The types of Bronchodilators

Bronchodilators have three types and they are as follows:



Figure 10.1: Types of Bronchodilators

Betaadrenergic

Beta-adrenergic agonists or Beta-agonists are medications that relax muscles of the airway, which widens the airways and results in easier breathing. They are a class of sympathomimetic agents which act upon the beta adrenoceptors. In general, pure beta-adrenergic agonists have the opposite function of beta blockers.

Anticholinergics

Anticholinergics are a class of drugs that block the action of the neurotransmitter acetylcholine in the brain. They are used to treat diseases like asthma, incontinence, gastrointestinal cramps, and muscular spasms. They are also prescribed for depression and sleep disorders.

Methylxanthines

Methylxanthines are bronchodilators used in the treatment of asthma and chronic obstructive pulmonary disease (COPD). Filter by: Apnea of Prematurity, Asthma, and Asthma, acute.

11.3 The methods of administering Bronchodilators

The methods of administering bronchodilators are as follows:

1. A **metered-dose inhaler (MDI)** is a device that delivers a specific amount of medication to the lungs, in the form of a short burst of aerosolized medicine that is usually self-administered by the patient via inhalation. Below are the examples of meter-dose inhaler.

To administer medication:

- Remove the cap and hold the inhaler upright.
- Shake the inhaler.
- Tilt your head back slightly and breathe out slowly and all the way.
- Position the inhaler approximately 1–2 inches away from the open mouth, or use a spacer/holding chamber. When using a medicine chamber, place the lips around the mouthpiece.
- Start breathing in slowly through your mouth, and press down on the inhaler one time. If using a chamber, first

press down on the inhaler and within 5 seconds, begin to breathe in slowly.

- Breathe in slowly and deeply for as long as possible.
- Hold your breath as you count to 10 slowly to allow the medication to reach down into your airways.
- Repeat puffs as directed, allowing 15–30 seconds between puffs for quick-acting medications. There is no need to wait for other medications.
- Apply the cap to the MDI for storage.
- After inhalation, rinse mouth with water when using a corticosteroid-containing MDI.



Metered dose inhaler with spacer



Breathe in slowly
Push down on the canister
Keep breathing in deeply
ADAM

Metered dose inhaler



Oral

Figure 10.2: Examples of different Samples of Inhaler

Summary of Study Session 11

In this study session, you have learnt that:

1. A bronchodilator is a substance that dilates the bronchi and bronchioles, reducing resistance in the respiratory airway and increasing airflow to the lungs.
2. Types of bronchodilators are beta-adrenergic, anticholinergics and methylxanthines
3. The method of administering bronchodilators using meter-dose inhaler can be seen in 10.3 of this study session.

Self-Assessment Questions (SAQs) for Study Session 11

After you have completed reviewing this study session, you can assess how well you have achieved its Learning Outcomes by answering the questions below. Write your answers in Study Diary and discuss them with your Tutor at the next Contact Session

SAQs 11.1 (tests learning outcomes 11.1)

What is bronchodilator?

SAQs 11.2 (tests learning outcomes 11.2)

Isoprel which is Beta 1 and Beta 2 sympathomimetic drug, also has its name as-----

- A. Albuterol
- B. Metaproteranol
- C. Formoterol
- D. Isopoteranol

SAQs 11.3 (tests learning outcomes 11.3)

When evaluating a patient's use of a metered dose inhaler, the nurse notes that the patient is unable to coordinate the activation of the inhaler with her breathing. What intervention would be most appropriate at this time?

- A. Notify the doctor that the patient is unable to use the inhaler.
- B. Obtain an order for a peak flow meter.
- C. Obtain an order for a spacer device.
- D. Ask the physician if the medication can be given orally.

Notes on SAQ

SAQ 2: the answer is D

SACQ 3: the answer is C. The use of a spacer may be indicated with metered dose inhalers, especially if success with inhalation is limited. The other options are not appropriate interventions.