STP 8-91V14-SM-TG

SOLDIER'S MANUAL AND TRAINER'S GUIDE

MOS 91V RESPIRATORY SPECIALIST

SKILL LEVELS 1/2/3/4

HEADQUARTERS, DEPARTMENT OF THE ARMY

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This conversion was done by the Advanced Training Office, AHS. If you find any significant differences between this manual and the printed version or have recommendations for improving the usability of this manual, send your comments to:

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SOLDIER TRAINING PUBLICATION
No. 8-91V14-SM-TG

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 3 October 1995

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SKILL LEVELS 1/2/3/4
AND TRAINER'S GUIDE

MOS 91V
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*This publication supersedes STP 8-91V14-SM-TG, 8 August 1991.

Subject Area 8: Ventilation Therapy

PREFACE

This publication is for skill level 1, 2, 3, and 4 soldiers holding military occupational specialty (MOS) 91V and for trainers and first-line supervisors. It contains standardized training objectives, in the form of task summaries, to train and evaluate soldiers on critical tasks which support unit missions during wartime. Trainers and first-line supervisors should ensure soldiers holding MOS/SL 91V1/2/3/4 have access to this publication. It should be made available in the soldier's work area, unit learning center, and unit libraries.

This manual applies to both Active and Reserve Component soldiers.

The proponent of this publication is the US Army Medical Department Center and School. Send comments and recommendations on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Commandant, Academy of Health Sciences, ATTN: MCCS-HRL, Fort Sam Houston, TX 78234-6122.

CHAPTER 1

INTRODUCTION

GENERAL

This manual identifies the individual MOS training requirements for soldiers in MOS 91V. Commanders, trainers, and soldiers should use it to plan, conduct, and evaluate individual training in units. This manual is the primary MOS reference to support the self-development and training of every soldier.

Use this manual with soldier's manuals of common tasks (STP 21-1-SMCT and STP 21-24-SMCT), Army training and evaluation programs (ARTEPs), and FM 25-101, Battle Focused Training, to establish effective training plans and programs which integrate soldier, leader, and collective tasks.

SOLDIER'S RESPONSIBILITIES

Each soldier is responsible for performing individual tasks which the first-line supervisor identifies based on the unit's METL. The soldier must perform the task to the standards listed in the SM. If a soldier has a question about how to do a task or which tasks in this manual he or she must perform, it is the soldier's responsibility to ask the first-line supervisor for clarification. The first-line supervisor knows how to perform each task or can direct the soldier to the appropriate training materials.

NCO SELF-DEVELOPMENT AND THE SOLDIER'S MANUAL

Self-development is one of the key components of the leader development program. It is a planned progressive and sequential program followed by leaders to enhance and sustain their military competencies. It consists of individual study, research, professional reading, practice, and self-assessment. Under the self-development concept, the NCO, as an Army professional, has the responsibility to remain current in all phases of the MOS. The SM is the primary source for the NCO to use in maintaining MOS proficiency.

Another important resource for NCO self-development is the Army Correspondence Course Program (ACCP). Refer to DA Pamphlet 351-20 for information on enrolling in this program and for a list of courses, or write to: Commandant, Academy of Health Sciences, US Army, ATTN: MCCS-HSN, Fort Sam Houston, TX 78234-6199.

Unit learning centers are valuable resources for planning self-development programs. They can help access enlisted career maps, training support products, and extension training materials.

TRAINING SUPPORT

This manual includes the following information which provides additional training support information.

- Appendix A, Respiratory Therapy Equations. This section contains commonly used formulas for various respiratory therapy calculations.

- Glossary. The glossary, which follows the last appendix, is a single comprehensive list of acronyms, abbreviations, definitions, and letter symbols.

- References. This section contains two lists of references, required and related, which support training of all tasks in this SM. Required references are listed in the conditions statement and are required for the soldier to do the task. Related references are materials which provide more detailed information and a more thorough explanation of task performance.

CHAPTER 2

TRAINER'S GUIDE (TG)

GENERAL

The TG identifies the essential components of a unit training plan for individual training. Units have different training needs and requirements based on differences in environment, location, equipment, dispersion, and similar factors. Therefore, the TG is a guide used for conducting unit training and not as a rigid standard.

The TG provides information necessary for planning training requirements for the MOS. The TG--

- Identifies subject areas in which to train soldiers.
- Identifies the critical tasks for each subject area.
- Specifies where soldiers are trained to standard on each task.
- Recommends how often to train each task to sustain proficiency.
- Recommends a strategy for cross-training soldiers.
- Recommends a strategy for training soldiers to perform higher level tasks.

BATTLE FOCUSED TRAINING

As described in FM 25-100, Training the Force, and FM 25-101, Battle Focused Training, the commander must first define the mission essential task list (METL) as the basis for unit training. Unit leaders use the METL to identify the collective, leader, and soldier tasks which support accomplishment of the METL. Unit leaders then assess the status of training and lay out the training objectives and the plan for accomplishing needed training. After preparing the long- and short-range plans, leaders then execute and evaluate training. Finally, the unit's training preparedness is reassessed, and the training management cycle begins again. This process ensures that the unit has identified what is important for the wartime mission, that the training focus is applied to the necessary training, and that training meets established objectives and standards.

RELATIONSHIP OF SOLDIER TRAINING PUBLICATIONS (STPs) TO BATTLE- FOCUSED TRAINING

The two key components of enlisted STPs are the Trainer's Guide (TG) and Soldier's Manual (SM). The TG and SM give leaders important information to help in the battle-focused training process. The TG relates soldier and leader tasks in the MOS and SL to duty positions and equipment. It provides information on where the task is trained, how often training should occur to sustain proficiency, and who in

the unit should be trained. As leaders go through the assessment and planning stages, they should use the TG as an important tool in identifying what needs to be trained.

The execution and evaluation of soldier and leader training should rely on the Armywide training objectives and standards in the SM task summaries. The task summaries ensure that soldiers in any unit or location have the same definition of task performance and that trainers evaluate the soldiers to the same standard. The diagram on the following page shows the relationship between battle-focused training and the use of the TG and SM. The left-hand side of the diagram (taken from FM 25-101) shows the soldier training process while the right side of the diagram shows how the STP supports each step of this process.

TRAINER'S RESPONSIBILITIES

Training soldier and leader tasks to standard and relating this training to collective mission-essential tasks is the NCO trainer's responsibility. Trainers use the steps below to plan and evaluate training.

- Identify soldier and leader training requirements. The NCO determines which tasks soldiers need to train on using the commander's training strategy. The unit's METL and ARTEP and the MOS Training Plan (MTP) in the TG are sources for helping the trainer define the individual training needed.

- Plan the training. Training for specific tasks can usually be integrated or conducted concurrently with other training or during "slack periods." The unit's ARTEP can assist in identifying soldier and leader tasks which can be trained and evaluated concurrently with collective task training and evaluation.

- Gather the training references and materials. The SM task summary lists all references which can assist the trainer in preparing for the training of that task.

- Determine risk assessment and identify safety concerns. Analyze the risk involved in training a specific task under the current conditions at the time of scheduled training. Ensure that your training preparation takes into account those cautions, warnings, and dangers associated with each task.

- Train each soldier. Show the soldier how the task is done to standard, and explain step-by-step how to do the task. Give each soldier one chance to do the task step-by-step.

- Emphasize training in mission-oriented protective posture (MOPP) level 4 clothing. Soldiers have difficulty performing even the very simple tasks in a nuclear/chemical environment. The combat effectiveness of the soldier and the unit can degrade quickly when trying to perform in MOPP 4. Practice is the best way to improve performance. The trainer is responsible for training and evaluating soldiers in MOPP 4 so that they are able to perform critical wartime tasks to standards under nuclear/chemical environment.

- Check each soldier. Evaluate how well each soldier performs the tasks in this manual. Conduct these evaluations during individual training sessions or while evaluating soldier proficiency during the conduct of unit collective tasks. This manual provides an evaluation guide for each task to enhance the trainer's ability to conduct year-round, hands-on evaluations of tasks critical to the unit's mission. Use the

BATTLE-FOCUS PROCESS		STP SUPPORT PROCESS
SELECTS SUPPORTING SOLDIER TASKS	_____	USES TG TO RELATE TASKS TO METL
CONDUCTS TRAINING ASSESSMENT	_____	USES TG TO DEFINE WHAT SOLDIER TASKS TO ASSESS
DETERMINES TRAINING OBJECTIVES	_____	USES TG TO SET OBJECTIVES
DETERMINES STRATEGY AND PLANS FOR TRAINING	_____	USES TG TO RELATE SOLDIER TASKS TO STRATEGY
CONDUCTS PRE-EXECUTION CHECKS	_____	USES SM TO DETERMINE TRAINING PREPARATION
EXECUTES TRAINING AND CONDUCTS AFTER-ACTION REVIEW	_____	USES SM TASK SUMMARY AS SOURCE FOR TASK PERFORMANCE
EVALUATES TRAINING AGAINST ESTABLISHED STANDARDS	_____	USES SM TASK SUMMARY AS STANDARD FOR EVALUATION

information in the MTP as a guide to determine how often to train the soldier on each task to ensure that soldiers sustain proficiency.

- Record the results. The leader book referred to in FM 25-101, appendix B, is used to record task performance and gives the leader total flexibility on the method of recording training. The trainer may use DA Forms 5164-R (Hands-On Evaluation) and 5165-R (Field Expedient Squad Book) as part of the leader book. The forms are optional and locally reproducible. STP 21-24-SMCT contains a copy of the forms and instructions for their use.

- Retrain and evaluate. Work with each soldier until he or she can perform the task to specific SM standards.

EVALUATION GUIDE

An evaluation guide exists for each task summary in the SM. Trainers use the evaluation guides year-round to determine if soldiers can perform their critical tasks to SM standards. Each evaluation guide contains one or more performance measures which identify what the trainer needs to observe to score a soldier's performance. Each step is clearly identified by a "P" (Pass) and "F" (Fail), located under the "Results" column on each evaluation guide. Some tasks involve a process which the trainer must observe as the soldier performs the task. For other tasks, the trainer must evaluate an "end product" resulting from doing the task. The following are some general points about using the evaluation guide to evaluate soldiers:

- Review the guide to become familiar with the information on which the soldier will be scored.

- Ensure that the necessary safety equipment and clothing needed for proper performance of the job are on hand at the training site.

- Prepare the test site according to the conditions section of the task summary. Some tasks contain special evaluation preparation instructions. These instructions tell the trainer what modifications must be made to the job conditions to evaluate the task. Reestablish the test site to the original requirements after evaluating each soldier to ensure that conditions are the same for each soldier.

- Advise each soldier of the information in the Brief Soldier section of the task summary before evaluating.

- Score each soldier according to the performance measures in the evaluation guide. Unless otherwise stated in the task summary, the soldier must pass all performance measures to be scored GO. If the soldier fails any steps, show what was done wrong and how to do it correctly.

- Record the date and task performance ("GO" or "NO-GO") in the leader book.

TRAINING TIPS FOR THE TRAINER

1. Prepare yourself.

- Get training guidance from your chain of command on when to train, which soldiers to train, availability of resources, and a training site.

- Get the training objective (task, conditions, and standards) from the task summary in this manual.

- Ensure you can do the task. Review the task summary and the references in the reference section. Practice doing the task or, if necessary, have someone train you on the task.

- Choose a training method.

- Prepare a training outline consisting of informal notes on what you want to cover during your training session.

- Practice your training presentation.

2. Prepare the resources.

- Obtain the required resources identified in the conditions statement for each task.

- Gather equipment and ensure it is operational.

- Coordinate for use of training aids and devices.

- Prepare the training site according to the conditions statement and evaluation preparation section of the task summary, as appropriate.

3. Prepare the soldiers.

- Tell the soldier what task to do and how well it must be done. Refer to the standards statement and evaluation preparation section for each task as appropriate.

- Caution soldiers about safety, environment, and security.

- Provide any necessary training on basic skills that soldiers must have before they can be trained on the task.

- Pretest each soldier to determine who needs training in what areas by having the soldier perform the task. Use DA Form 5164-R and the evaluation guide in each task summary to make this determination.

4. Train the soldiers who failed the pretest.

- Demonstrate how to do the task or the specific performance steps to those soldiers who could not perform to SM standards. Have soldiers study the appropriate materials.

- Have soldiers practice the task until they can perform it to SM standards.

- Evaluate each soldier using the evaluation guide.

- Provide feedback to those soldiers who fail to perform to SM standards and have them continue to practice until they can perform to SM standards.

5. Record results in the leader book.

MILITARY OCCUPATIONAL SPECIALTY TRAINING PLAN

One of the key components of the TG is the MOS Training Plan (MTP). The MTP has two parts to assist the commander in preparing a unit training plan which satisfies integration, cross-train, train-up, and sustainment training requirements for soldiers in this MOS.

PART ONE

Part one of the MTP shows the relationship of an MOS SL between duty position and critical tasks. The critical tasks are grouped by task commonality into subject areas. Section I lists subject area numbers and titles used throughout the MTP. Section II defines the training requirements for each duty position within an MOS and relates duty positions to subject areas and cross-training and train-up/merger requirements.

- Duty position column--contains the MOS duty positions, by skill level, which have different training requirements.

- Subject area column--lists by subject area number, the subject areas in which the soldier must be proficient for that duty position.

- Cross-train column--lists the recommended duty position for which soldiers should be cross-trained.

- Train-up/merger column--lists the corresponding duty position for the next higher SL or MOS the soldier will merge into on promotion.

PART TWO

Part two lists by subject areas, the critical tasks to be trained in an MOS, task number, task title, location, sustainment training frequency, and training SL.

- Subject area column--lists the subject area number and title in the same order as in the MTP, Part One, Section I.

- Task number column--lists the task numbers for all tasks included in the subject area.

- Task title column--lists the task title.

- Training location column--identifies the training location where the task is first trained to STP standards. If the task is first trained to standard in the unit, the word "UNIT" will be in this column. If the task is first trained to standard in the training base, it will identify the resident course where the task was taught.

Figure 2-1 contains a list of training locations and their brevity codes.

AIT	-	Advanced Individual Training
ANCOC	-	Advanced Noncommissioned Officer's Course
BCT	-	Basic Combat Training
BNC	-	Basic Noncommissioned Officer's Course
OSUT	-	One Station Unit Training
PLDC	-	Primary Leadership Development Course
SMC	-	Sergeants Major Course
UNIT	-	Trained in the Unit

Figure 2-1. Training locations

- Sustainment training frequency column--indicates the recommended frequency at which tasks should be trained to ensure the soldier maintains task proficiency. Figure 2-2 identifies the frequency codes to use in this column.

AN - annually
BM - bimonthly (once every two months)
MO - monthly
QT - quarterly
SA - semiannually

Figure 2-2. Sustainment training frequency codes

- Sustainment training SL column--lists the SLs of the MOS for which soldiers must receive sustainment training to ensure they maintain proficiency to SM standards.

- A chart at the end of the MTP indicates the ARTEPs which the individual critical tasks support. This establishes the crosswalk between individual and collective training.

MOS TRAINING PLAN

MOS 91V

PART I. SUBJECT AREAS AND DUTY POSITIONS

SECTION 1. SUBJECT AREA CODES

1. Contamination Control
2. Vital Signs
3. Emergency Medical Treatment
4. Basic Procedures
5. Respiratory Care Procedures
6. Airway Management
7. Gas Therapy
8. Ventilation Therapy

SECTION 2. DUTY POSITION TRAINING REQUIREMENTS

	DUTY POSITION	SUBJECT AREAS	CROSS TRAIN	TRAIN-UP/ MERGER
SL 1	Respiratory Specialist	1-8	NA	NA
SL 2	Respiratory Specialist	1-8	NA	NA
SL 3	Respiratory NCO	1-8	NA	NA
SL 4	Senior Respiratory NCO	1-8	NA	91B50, Senior Medical NCO

MOS TRAINING PLAN

Part II. CRITICAL TASKS **MOS 91V** **Skill Level 1**

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
1. Contami-	081-831-0007	Perform a Patient Care Handwash	AIT	SA	1-4
nation Control	081-831-0008	Put On Sterile Gloves	AIT	SA	1-4
2. Vital Signs	081-831-0013	Measure a Patient's Temperature	AIT	AN	1-4
	081-831-0011	Measure a Patient's Pulse	AIT	AN	1-4
	081-831-0010	Measure a Patient's Respirations	AIT	AN	1-4
	081-831-0012	Measure a Patient's Blood Pressure	AIT	AN	1-4
3. Emergency	081-831-0018	Open the Airway	AIT	SA	1-4
Medical	081-831-0019	Clear an Upper Airway Obstruction	AIT	SA	1-4
Treatment	081-831-0048	Perform Rescue Breathing	AIT	SA	1-4
	081-831-0046	Administer External Chest Compressions	AIT	SA	1-4
4. Basic	081-833-0007	Establish a Sterile Field	AIT	AN	1-4
Procedures	081-833-0088	Prepare an Injection for Administration	AIT	AN	1-4
	081-833-0031	Initiate Treatment for Anaphylactic Shock	AIT	AN	1-4
	081-830-3008	Clean a Fiberoptic Bronchoscope	AIT	AN	1-4
5. Respiratory	081-830-3005	Perform Auscultation of the Lungs	AIT	AN	1-4
Care Procedures	081-830-3003	Instruct a Patient on the Use of an Incentive Spirometer Device	AIT	AN	1-4
	081-830-3007	Administer Postural Drainage and Percussion on an Adult	AIT	AN	1-4
	081-830-3013	Assess a Patient's Ventilatory Parameters at Bedside	AIT	AN	1-4
6. Airway	081-833-0016	Insert an Oropharyngeal Airway (J Tube)	AIT	AN	1-4
Management	081-833-0017	Ventilate a Patient With a Bag-Valve-Mask System	AIT	AN	1-4
	081-833-0021	Perform Oral and Nasotracheal Suctioning of a Patient	AIT	AN	1-4
	081-835-3023	Perform Tracheostomy Suctioning	AIT	AN	1-4
	081-835-3024	Provide Tracheostomy Care	AIT	AN	1-4
	081-830-3015	Prepare Intubation Equipment	AIT	AN	1-4
	081-830-3016	Intubate a Patient	AIT	AN	1-4
	081-830-3014	Extubate a Patient	AIT	AN	1-4
7. Gas	081-830-3000	Prepare a Medical Gas Cylinder for Patient Use	AIT	AN	1-4
Therapy	081-830-3001	Administer Gas Therapy	AIT	AN	1-4
	081-830-3002	Administer Nebulization Therapy	AIT	AN	1-4
	081-830-3017	Administer Aerosol Therapy	AIT	AN	1-4

Part II. CRITICAL TASKS **MOS 91V** **Skill Level 1**

Subject Area	Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SL
8. Ventilation Therapy	081-830-3006	Perform an Arterial Puncture	AIT	AN	1-4
	081-830-3009	Set Up a Pressure/Volume Cycled Ventilator	AIT	AN	1-4
	081-830-3011	Provide Assist Ventilation	AIT	AN	1-4
	081-830-3010	Provide Continuous Ventilation	AIT	AN	1-4
	081-830-3012	Remove a Patient From a Ventilator	AIT	AN	1-4

INDIVIDUAL TASK/ARTEP CROSSWALK

	705	715	725	765-30
081-831-0007	X	X	X	X
081-831-0008	X	X	X	X
081-831-0013	X	X	X	X
081-831-0011	X	X	X	X
081-831-0010	X	X	X	X
081-831-0012	X	X	X	X
081-831-0018	X	X	X	X
081-831-0019	X	X	X	X
081-831-0048	X	X	X	X
081-831-0046	X	X	X	X
081-833-0007	X	X	X	X
081-833-0088	X		X	X
081-833-0031	X	X	X	X
081-830-3008	X	X	X	X
081-830-3005	X	X	X	X
081-830-3003	X	X	X	X
081-830-3007	X	X	X	X
081-830-3013	X	X	X	X
081-833-0016	X	X	X	X
081-833-0017	X	X	X	X
081-833-0021	X	X	X	X
081-835-3023	X	X	X	X
081-835-3024	X	X	X	X

INDIVIDUAL TASK/ARTEP CROSSWALK

	705	715	725	765-30
081-830-3015				
081-830-3016				
081-830-3014	X	X	X	X
081-830-3000	X	X	X	X
081-830-3001	X	X	X	X
081-830-3002	X	X	X	X
081-830-3017	X	X	X	X
081-830-3006	X	X	X	
081-830-3018	X	X	X	X
081-830-3009	X	X	X	X
081-830-3011	X	X	X	X
081-830-3010	X	X	X	X
081-830-3019	X	X	X	X
081-830-3012	X	X	X	X

CHAPTER 3

MOS SKILL LEVEL TASKS

081-831-0007

PERFORM A PATIENT CARE HANDWASH

CONDITIONS

You are about to administer patient care or have just had hand contact with a patient or contaminated material. Necessary materials and equipment: running water or two empty basins, a canteen, a water source, soap, towels (cloth or paper), and a towel receptacle or trash can.

STANDARDS

Perform a patient care handwash without recontaminating your hands.

TRAINING/EVALUATION

Training Information Outline

1. Remove wristwatch and jewelry, if applicable.

NOTE: Rings should not be worn. If rings are worn, they should be of simple design with few crevices for harboring bacteria. Fingernails should be clean, short, and free of nail polish.

2. Roll shirt sleeves to above the elbows, if applicable.

3. Prepare to perform the handwash.

   a. If using running water, turn on the warm water.

   b. If running water is not available, set up the basins and open the canteen.

4. Wet the hands, wrists, and forearms.

   a. If using running water, hold the hands, wrists, and forearms under the running water.

   b. If running water is not available, fill one basin with enough water to cover the hands and refill the canteen.

5. Cover the hands, wrists, and forearms with soap.

NOTE: For routine patient care, use regular hand soap. For an invasive procedure such as a catheterization or an injection, use antimicrobial soap.

6. Wash the hands, wrists, and forearms.

    a. Use a circular scrubbing motion, going from the fingertips toward the elbows.

    b. Give particular attention to creases and folds in the skin.

    c. Wash ring(s), if present.

7. Rinse the hands, wrists, and forearms.

    a. If using running water.

        (1) Hold the hands higher than the elbow under the running water until all soap is removed.

        (2) Do not touch any part of the sink or faucet.

    b. If not using running water.

        (1) Use a clean towel to grasp the canteen with one hand.

        (2) Rinse the other hand, wrist, and forearm, letting the water run into the empty basin. Hold the hands higher than the elbows.

        (3) Repeat the procedure for the other arm.

        (4) Do not touch any dirty surfaces while rinsing the hands.

8. Dry the hands, wrists, and forearms.

    a. Use a towel to dry one arm from the fingertips to the elbow without retracing the path with the towel.

    b. Dispose of the towel properly without dropping the hand below waist level.

    c. Repeat the process for the other arm using another towel.

9. Use a towel to turn off the running water, if applicable.

10. Reinspect the fingernails and clean them and rewash the hands, if necessary.

Evaluation Preparation

Setup: None

Brief soldier: Tell the soldier to perform a patient care handwash. You may specify which method to use. The soldier need not perform both.

Evaluation Guide

Performance Measures	**Results**	
1. Remove wristwatch and jewelry, if applicable.	P	F
2. Roll shirt sleeves to above the elbows, if applicable.	P	F
3. Prepare to perform the handwash.	P	F
4. Wet hands, wrists, and forearms.	P	F
5. Cover the hands, wrists, and forearms with soap.	P	F
6. Wash the hands, wrists, and forearms.	P	F
7. Rinse the hands, wrists, and forearms.	P	F
8. Dry the hands, wrists, and forearms.	P	F
9. Use a towel to turn off the running water, if applicable.	P	F
10. Reinspect the fingernails and clean them and rewash the hands, if necessary.	P	F

REFERENCES:	***Required***	***Related***
	None	FM 8-230

081-831-0008

PUT ON STERILE GLOVES

CONDITIONS

Necessary materials and equipment: handwashing facilities, sterile gloves, and a flat, clean, dry surface.

STANDARDS

Put on and remove sterile gloves without contaminating self or the gloves.

TRAINING/EVALUATION

Training Information Outline

1. Select and inspect the package.
    a. Select the proper size of glove.
    b. Inspect the package for possible contamination.
        (1) Water spots.
        (2) Moisture.
        (3) Tears.
        (4) Any other evidence that the package is not sterile.
2. Perform a patient care handwash.
3. Open the sterile package.
    a. Place the package on a flat, clean, dry surface in the area where the gloves are to be worn.
    b. Peel the outer wrapper open to completely expose the inner package.
4. Position the inner package.
    a. Remove the inner package touching only the folded side of the wrapper.
    b. Position the package so that the cuff end is nearest the soldier.

5. Unfold the inner package.

    a. Grasp the lower corner of the package.

    b. Open the package to a fully flat position without touching the gloves.

6. Expose both gloves.

    a. Grasp the lower corners or designated areas on the folder.

    b. Pull gently to the side without touching the gloves.

7. Put on the first glove.

    a. Grasp the cuff at the folded edge and remove it from the wrapper.

    b. Step away from the table or tray.

    c. Keeping the hands above the waist, insert the fingers of the other hand into the glove.

    d. Pull the glove on touching only the exposed inner surface of the glove.

NOTE: If there is difficulty in getting the fingers fully fitted into the glove fingers, make the adjustment after both gloves are on.

8. Put on the second glove.

    a. Insert the fingertips of the gloved hand under the edge of the folded over cuff.

NOTE: The gloved thumb may be kept up and away from the cuff area or may be inserted under the edge of the folded over cuff with the fingertips.

    b. Keeping the hands above the waist, insert the fingers of the ungloved hand into the glove.

    c. Pull the glove on.

    d. Do not contaminate either glove.

9. Adjust the gloves to fit properly.

    a. Grasp and pick up the glove surfaces on the individual fingers to adjust them.

    b. Pick up the palm surfaces and work the fingers and hands into the gloves.

    c. Interlock the gloved fingers and work the gloved hands until the gloves are firmly on the fingers.

NOTE: If either glove tears while putting them on or adjusting the gloves, both gloves must be removed and the procedure must be repeated.

10. Remove the gloves.

    a. Grasp one glove at the heel of the hand with the other gloved hand.

    b. Peel off the glove, retaining it in the palm of the gloved hand.

    c. Reach under the cuff of the remaining glove with one or two fingers of the ungloved hand.

    d. Peel off the glove over the glove being held in the palm.

    e. Do not contaminate self.

CAUTION

Do not "snap" the gloves while removing them.

11. Discard the gloves IAW local SOP.

12. Perform a patient care handwash.

Evaluation Preparation

Setup: If performance of this task must be simulated for training and evaluation, the same gloves may be used repeatedly as long as they are properly rewrapped after each use. You may give the soldier a torn or moist glove package to test step 1.

NOTE: If the soldier does not know his or her glove size, have several different sizes available to try on to determine the correct size.

Brief soldier: Tell the soldier to put on and remove the sterile gloves.

Evaluation Guide

Performance Measures	Results	
1. Select and inspect the package.	P	F
2. Perform a patient care handwash.	P	F
3. Open the sterile package.	P	F
4. Position the inner package.	P	F
5. Unfold the inner package.	P	F
6. Expose both gloves.	P	F
7. Put on the first glove.	P	F
8. Put on the second glove.	P	F
9. Adjust the gloves to fit properly.	P	F
10. Remove the gloves.	P	F
11. Discard the gloves IAW the local SOP.	P	F
12. Perform a patient care handwash.	P	F

REFERENCES: None

081-831-0013

MEASURE A PATIENT'S TEMPERATURE

CONDITIONS

You have performed a patient care handwash. Necessary materials and equipment: disinfected oral and rectal thermometers, thermometer canisters marked "used," water soluble lubricant, gauze pads, a watch, and appropriate forms.

STANDARDS

Record a patient's temperature to the nearest 0.2° F.

TRAINING/EVALUATION

Training Information Outline

1. Determine which site to use.

a. Take an oral temperature if the patient is conscious, can follow directions, and can breathe normally through the nose.

CAUTION

Do not take an oral temperature when the patient--

1. Has had recent facial or oral surgery;
2. Is confused, disturbed, or heavily sedated;
3. Is being administered oxygen by mouth or nose;
4. Is likely to bite down on the thermometer;
5. Has smoked, chewed gum, or ingested anything hot or cold within the last 15 to 30 minutes.

b. Take a rectal temperature if the oral site is ruled out by the patient's condition or when the patient is unconscious.

CAUTION

Do not take a rectal temperature on a patient with a cardiac condition, diarrhea, a rectal disorder such as hemorrhoids, or recent rectal surgery.

c. Take an axillary temperature if the patient's condition rules out using the other two methods.

2. Select the proper thermometer.

   a. An oral thermometer has a blue tip and may be labeled "Oral."

   b. A rectal thermometer has a red tip and may be labeled "Rectal."

   c. Axillary temperatures are taken with oral thermometers.

3. Explain the procedure and position the patient.

   a. Take an oral temperature with the patient seated or lying face up.

   b. Take a rectal temperature with the patient lying on either side with the top knee flexed.

   c. Take an axillary temperature with the patient lying face up with the armpit exposed.

4. Measure the temperature.

   a. Shake the thermometer down to below 94? F.

   b. Place the thermometer at the proper site.

(1) If you are taking an oral temperature, place the thermometer in the heat pocket under the tongue and tell the patient to close his or her lips and not to bite down.

(2) If you are taking a rectal temperature, insert the thermometer 1 to 2 inches into his or her rectum.

CAUTION

Lubricate the tip prior to insertion. Hold the thermometer in place.

(3) If you are taking an axillary temperature, pat the armpit dry and then place the bulb end in the center with the glass tip protruding to the front of the patient's body. Place the arm across his or her chest.

   c. Leave the thermometer in place for the required time.

(1) Oral--at least 3 minutes.

(2) Rectal--at least 2 minutes.

(3) Axillary--at least 10 minutes.

5. Remove the thermometer and wipe it down with a gauze square.

6. Read the scale.

7. Put the thermometer in the proper "used" canister.

8. Record the temperature to the nearest 0.2° F on the appropriate forms and report any abnormal temperature change immediately to the supervisor.

NOTE: The normal temperature range is--

Oral	- 97.0° F to 99.0° F.
Rectal	- 98.0° F to 100.0° F.
Axillary	- 96.0° F to 98.0° F.

NOTE: Record an axillary temperature with an "A" on the patient's record. Record a rectal temperature with an "R" on the patient's record.

Evaluation Preparation

Setup: To test step 1 for evaluation purposes, create a scenario in which the patient's condition will dictate which site the soldier must choose.

Brief soldier: Tell the soldier to measure, evaluate, and record a patient's temperature.

Evaluation Guide

Performance Measures	**Results**	
1. Determine which site to use.	P	F
2. Select the proper thermometer.	P	F
3. Explain the procedure and position the patient.	P	F
4. Measure the temperature.	P	F
5. Remove the thermometer and wipe it down with a gauze square.	P	F
6. Read the scale.	P	F
7. Put the thermometer in the proper "used" canister.	P	F
8. Record the temperature to the nearest 0.2° F on the appropriate forms and report any abnormal temperature change immediately to the supervisor.	P	F

REFERENCES:	***Required***	***Related***
	None	FM 8-230

081-831-0011

MEASURE A PATIENT'S PULSE

CONDITIONS

Necessary materials and equipment: a watch, stethoscope, and appropriate forms.

STANDARDS

Count a patient's pulse for one full minute. Identify any abnormalities in the pulse rate, rhythm, and strength.

TRAINING/EVALUATION

Training Information Outline

1. Position the patient so that the pulse site is accessible.
2. Palpate the pulse site.
    a. Place the tips of the index and middle fingers on the pulse site.

NOTE: A stethoscope must be used to monitor the apical site.

    b. Press the fingers, using moderate pressure, to feel the pulse.
3. Count for one full minute and evaluate the pulse.

NOTE: To detect irregularities, it is necessary to count for one full minute.

    a. Pulse rate.
        (1) Normal adult rate--60 to 80 beats per minute.
        (2) Bradycardia--less than 50 beats per minute.
        (3) Tachycardia--more than 100 beats per minute.
    b. Pulse rhythm.
        (1) Regular.
            (a) Usually easy to find.
            (b) Has a regular rate and rhythm.

(c) Varies with the individual.

(2) Irregular/intermittent--any change from a regular beating pattern.

NOTE: If a peripheral pulse is irregular or intermittent, a second pulse should be taken at the carotid, femoral, or apical site. (See Figure 3-1.)

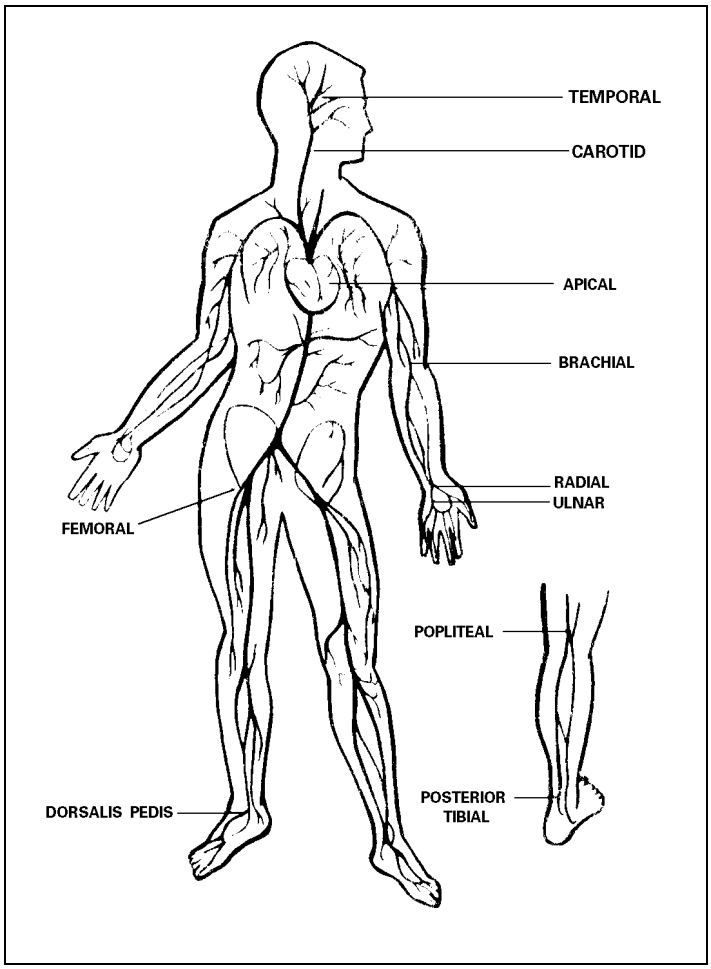


Figure 3-1

c. Pulse strength.

(1) Strong.

(a) Easy to find.

(b) Has even beats with good force.

(2) Bounding.

(a) Easy to find.

(b) Exceptionally strong heartbeats which make the arteries difficult to compress.

(3) Weak/thready--difficult to find.

4. Record the rate, rhythm, strength, and any significant deviations from normal on the appropriate forms.

5. Report any significant pulse abnormalities to the supervisor immediately.

Evaluation Preparation

Setup: While the soldier is palpating a pulse site, you must palpate the corresponding site. Specify which site the soldier is to palpate. If the apical site is chosen, either a double stethoscope or separate stethoscopes may be used. A tolerance of plus or minus two beats will be allowed.

Brief soldier: Tell the soldier to count, evaluate, and record the patient's pulse.

Evaluation Guide

Performance Measures	**Results**	
1. Position the patient so that the pulse site is accessible.	P	F
2. Palpate the pulse site.	P	F
3. Count for one full minute and evaluate the pulse.	P	F
4. Record the rate, rhythm, strength, and any significant deviations from normal on the appropriate forms.	P	F
5. Report any significant pulse abnormalities to the supervisor immediately.	P	F

REFERENCES: None

081-831-0010

MEASURE A PATIENT'S RESPIRATIONS

CONDITIONS

Necessary materials and equipment: a watch and appropriate forms.

STANDARDS

Count a patient's respirations for one full minute. Identify any abnormalities in respiration rate, depth, rhythm, pattern, and quality.

TRAINING/EVALUATION

Training Information Outline

1. Count the number of times the chest rises in one minute.

NOTE: The patient should not be aware that respirations are being counted. If the patient is aware, he or she often becomes tense, and an accurate count becomes extremely difficult. The normal respiration rate for an adult is generally considered to be between 12 and 20 respirations per minute.

2. Evaluate the respirations.

   a. Depth.

      (1) Normal--deep, even movement of the chest.

      (2) Shallow--minimal rise and fall of the chest and abdomen.

      (3) Deep--the rib cage expands fully, and the diaphragm descends to create a maximum capacity.

   b. Rhythm and pattern.

      (1) Healthy--exhalations are twice as long as inhalations.

      (2) Irregular.

      (3) Hypoventilation--slow and shallow respirations.

      (4) Hyperventilation--sustained increased rate and depth of respiration.

      (5) Sigh--deep inhalation followed by a slow audible exhalation.

(6) Apnea--temporary absence of breathing.

(7) Tachypnea--increased respiration rate, usually 24 or more breaths per minute.

c. Quality.

(1) Normal--effortless, automatic, regular rate, even depth, noiseless, and free of discomfort.

(2) Dyspnea--difficult or labored breathing.

(3) Wheezing or whistling sound.

(4) Rattling or bubbling.

3. Check for the physical characteristics of abnormal respirations.

a. Appearance--the casualty may appear restless, anxious, pale, ashen, or cyanotic.

b. Position--the casualty may alter his or her position by leaning forward or may be unable to lie flat.

c. Cough.

(1) Acute--comes on suddenly.

(2) Chronic--has existed for a long time.

(3) Dry--coughs without sputum.

(4) Productive--coughs which expel sputum.

(a) Normal sputum--clear, semiliquid mucus which may appear watery, frothy, or thick.

(b) Abnormal sputum--may be green, yellow, gray, or blood-tinged, and may have a foul or sweetish smell.

4. Record the rate of respirations and any observations noted on the appropriate forms.

5. Report any abnormal respirations to the supervisor immediately.

Evaluation Preparation

Setup: You must count the rate with the soldier. If you are using a simulated patient, you may test step 2 by having him or her purposely exhibit abnormal breathing characteristics. A tolerance of plus or minus two counts will be allowed.

Brief soldier: Tell the soldier to count, evaluate, and record a patient's respirations.

Evaluation Guide

Performance Measures	**Results**	
1. Count the number of times the chest rises in one minute.	P	F
2. Evaluate the respirations.	P	F
3. Check for the physical characteristics of abnormal respirations.	P	F
4. Record the rate of respirations and any observations noted on the appropriate forms.	P	F
5. Report any abnormal respirations to the supervisor immediately.	P	F

REFERENCES: None

081-831-0012

MEASURE A PATIENT'S BLOOD PRESSURE

CONDITIONS

Necessary materials and equipment: sphygmomanometer, clean stethoscope, and appropriate forms.

STANDARDS

Measure a patient's blood pressure and record the measurement on the appropriate forms.

TRAINING/EVALUATION

Training Information Outline

1. Explain the procedure to the patient, if necessary.

    a. The length of time the procedure will take.

    b. The site to be used.

    c. The physical sensations the patient will feel.

2. Check the equipment.

    a. Ensure that the cuff is deflated completely and fully retighten the thumbscrew.

    b. Ensure the sphygmomanometer gauge reads zero.

NOTE: Steps 2, 3, and 4 describe the procedure for taking the blood pressure at the brachial site. If the brachial site cannot be used, measure the blood pressure using a larger cuff applied to the thigh. The patient should be lying down (preferably on the stomach; otherwise, on the back with one knee flexed). Apply the cuff at mid-thigh, and place the stethoscope over the popliteal artery. The remainder of the procedure is the same as for the brachial artery site.

3. Position the patient.

    a. Place the patient in a relaxed and comfortable sitting, standing, or lying position.

NOTE: A reading obtained from a standing position will be slightly higher.

    b. Place the patient's arm palm up at approximately heart level. Support the arm so that it is relaxed.

4. Place the cuff at the brachial artery site.

a. Place the cuff so that the lower edge is one to two inches above the elbow and the bladder portion is over the artery.

b. Wrap the cuff just tightly enough to prevent slippage.

c. If applicable, clip the gauge to the cuff in alignment with the palm.

5. Position the stethoscope, if used.

a. Palpate for the brachial pulse.

b. Place the diaphragm of the stethoscope over the pulse site.

6. Inflate the cuff until the gauge reads at least 140 mm Hg or 10 mm Hg higher than the usual range for that patient, if known.

NOTE: If a pulsation is heard when the gauge reaches 140 mm Hg, continue to inflate the cuff 10 mm Hg beyond the point at which the last pulsation was heard.

CAUTION

The cuff should not remain inflated for more than two minutes.

7. Determine the blood pressure.

a. If a stethoscope is used, complete the following steps.

(1) Rotate the thumbscrew slowly in a counterclockwise motion, allowing the cuff to deflate slowly.

(2) Watch the gauge and remember the reading when the first distinct sound is heard (systolic pressure).

(3) Continue to watch the gauge and remember the reading where the sound changes again and becomes muffled or unclear (diastolic pressure).

(4) Release the remaining air.

b. If a stethoscope is not used, complete the following steps.

(1) Palpate for the radial pulse.

(2) Rotate the thumbscrew slowly in a counterclockwise motion, allowing the cuff to deflate slowly.

(3) Watch the gauge and remember the point at which the pulse returns (systolic pressure).

NOTE: The diastolic pressure cannot be determined using this method.

NOTE: If the procedure must be repeated, wait at least one minute before repeating steps 5 through 7.

8. Record the blood pressure on the appropriate forms.
   a. Record the systolic reading over the diastolic reading, for example 120/80.
   b. Record the readings in even numbers.
9. Evaluate the blood pressure reading by comparing it with one of the following:
   a. The patient's previous reading.
   b. An average of the patient's previous readings.
   c. The normal range: 100-140/60-90 for males and 90-130/50-60 for females.
10. Report abnormal readings to the supervisor.

Evaluation Preparation

Setup: A double stethoscope should be used if available. A tolerance of ± 4 mm Hg will be allowed. If other methods are used, such as independent measurements on different sites or at different times, the evaluator must apply discretion in applying the ± 4 mm Hg standard. You will allow the soldier to retake the blood pressure at least once if the soldier feels that it is necessary to obtain an accurate reading. You will use discretion in allowing additional repetitions based upon the difficulty of obtaining a reading on the patient.

Brief soldier: Tell the soldier to take a patient's blood pressure. Tell the soldier that the blood pressure may be retaken, if necessary, to obtain an accurate reading.

Evaluation Guide

Performance Measures	Results
1. Explain the procedure to the patient, if necessary.	P F
2. Check the equipment.	P F
3. Position the patient.	P F
4. Place the cuff just tightly enough to prevent slippage.	P F
5. Position the stethoscope, if used.	P F
6. Inflate the cuff until the gauge reads at least 140 mm Hg or 10 mm Hg higher than the usual range for that patient, if known.	P F
7. Determine the blood pressure.	P F
8. Record the blood pressure on the appropriate forms.	P F
9. Evaluate the blood pressure.	P F
10. Report any abnormal readings to the supervisor.	P F

REFERENCES: None

081-831-0018

OPEN THE AIRWAY

CONDITIONS

You are evaluating a casualty who is not breathing. You are not in an NBC environment.

STANDARDS

All of the steps to open the casualty's airway are completed without causing unnecessary injury.

Training Information Outline

1. Roll the casualty onto his or her back, if necessary.
   a. Kneel beside the casualty.
   b. Raise the near arm and straighten it out above the head.
   c. Adjust the legs so that they are together and straight or nearly straight.
   d. Place one hand on the back of the casualty's head and neck.
   e. Grasp the casualty under the arm with the free hand.
   f. Pull steadily and evenly toward you, keeping the head and neck in line with the torso.
   g. Roll the casualty as a single unit.
   h. Place the casualty's arms at his or her sides.
2. Establish the airway using the head-tilt/chin-lift or jaw thrust method.
   a. Head-tilt/chin-lift method.

CAUTION

Do not use this method if a spinal or neck injury is suspected.

NOTE: Remove any foreign material or vomitus seen in the mouth as quickly as possible.

(1) Kneel at the level of the casualty's shoulders.

(2) Place one hand on the casualty's forehead and apply firm, backward pressure with the palm of the hand to tilt the head back.

(3) Place the fingertips of the other hand under the boney part of the casualty's lower jaw, bringing the chin forward.

CAUTIONS

1. Do not use the thumb to lift the lower jaw.
2. Do not press deeply into the soft tissue under the chin with the fingers.
3. Do not completely close the casualty's mouth.

b. Jaw thrust.

CAUTION

Use this method if a spinal or neck injury is suspected.

(1) Kneel at the top of the casualty's head.

(2) Grasp the angles of the casualty's lower jaw.

(3) Rest the elbows on the surface on which the casualty is lying.

(4) Lift with both hands displacing the lower jaw forward while tilting the head backward.

NOTE: If this procedure is unsuccessful, tilt the head very slightly.

3. Check for breathing within three to five seconds. While maintaining the open airway position, place an ear over the casualty's mouth and nose, looking toward the chest and stomach.

a. Look for the chest to rise and fall.

b. Listen for air escaping during exhalation.

c. Feel for the flow of air on the side of the casualty's face.

4. Take appropriate action.

a. If the casualty resumes breathing, maintain the airway and place the casualty in the recovery position.

(1) Roll the casualty as a single unit onto his or her side.

(2) Place the lower arm behind his or her back.

(3) Place the hand of the upper arm under his or her chin.

(4) Flex the upper leg.

NOTE: Check the casualty for other injuries, if necessary.

b. If the casualty does not resume breathing, perform rescue breathing. (See task 081-831-0048.)

Evaluation Preparation

Setup: Place a CPR mannequin or another soldier acting as the casualty face down on the ground. For training and evaluation, you may specify to the soldier whether the casualty has a spinal injury to test step 2, or you may create a scenario in which the casualty's condition will dictate to the soldier how to treat the casualty. After step 3 tell the soldier whether the casualty is breathing or not and ask what should be done.

Brief soldier: Tell the soldier to open the casualty's airway.

Evaluation Guide

Performance Measures	**Results**	
1. Roll the casualty onto his or her back, if necessary.	P	F
2. Establish the airway using the head-tilt/chin-lift or jaw thrust method.	P	F
3. Check for breathing within three to five seconds.	P	F
4. Take appropriate action.	P	F
5. Do not cause further injury to the casualty.	P	F

REFERENCES: None

081-831-0019

CLEAR AN UPPER AIRWAY OBSTRUCTION

CONDITIONS

You are evaluating a casualty who is not breathing or is having difficulty breathing, and you suspect the presence of an upper airway obstruction.

STANDARDS

Complete, in order, all the steps necessary to clear an object from a casualty's upper airway. Continue the procedure until the casualty can talk and breathe normally or until you are relieved by a qualified person.

TRAINING/EVALUATION

Training Information Outline

1. Clear the airway.

    a. Conscious casualty.

        (1) Determine whether or not the casualty needs help. Ask the casualty whether he or she is choking.

        (a) If the casualty has good air exchange (is able to speak, coughs forcefully, or wheezes between coughs), do not interfere except to encourage the casualty.

        (b) If the casualty has poor air exchange (weak, ineffective cough; high-pitched noise while inhaling; increased respiratory difficulty; and possible cyanosis), continue with step 1a(2).

        (c) If the casualty has a complete airway obstruction (is unable to speak, breathe, or cough and may clutch the neck between the thumb and finger), continue with step 1a(2).

        (2) If the casualty is lying down, bring him or her to a sitting or standing position.

        (3) Apply abdominal or chest thrusts.

NOTE: Use abdominal thrusts unless the casualty is in the advanced stages of pregnancy, is very obese, or has a significant abdominal wound.

        (a) Abdominal thrusts.

            1. Stand behind the casualty and wrap your arms around his or her waist.

2. Make a fist with one hand and place the thumb side of the fist against the casualty's abdomen in the midline slightly above the navel and well below the tip of the xiphoid process.

3. Grasp the fist with your other hand and press the fist into the casualty's abdomen with quick backward and upward thrusts.

NOTE: Make each thrust a separate, distinct movement given with the intent of relieving the obstruction.

4. Continue giving thrusts until the blockage is expelled, or the casualty becomes unconscious.

(b) Chest thrusts.

1. Stand behind the casualty and encircle his or her chest with your arms just under the armpits.

2. Make a fist with one hand and place the thumb side of the fist against the middle of the casualty's breastbone.

CAUTION

Do not position the hand on the xiphoid process or the lower margins of the rib cage.

3. Grasp the fist with your other hand and give backward thrusts.

NOTE: Administer each thrust with the intent of relieving the obstruction.

4. Continue giving thrusts until the blockage is expelled, or the casualty becomes unconscious.

NOTE: If the casualty becomes unconscious, position the casualty on his or her back, perform a finger sweep (see step 1b(2)), open the airways (see task 081-831-0018), and then start rescue breathing procedures (see task 081-831-0048).

b. Unconscious casualty.

NOTE: Perform abdominal or chest thrusts on the unconscious casualty only after attempts to open the airway and ventilate the casualty indicate that the airway is obstructed.

(1) Apply abdominal or chest thrusts.

NOTE: Use abdominal thrusts unless the casualty is in the advanced stages of pregnancy, is very obese, or has a significant abdominal wound.

(a) Abdominal thrusts.

1. Kneel astride the casualty's thighs.

2. Place the heel of one hand against the casualty's abdomen in the midline slightly above the navel and well below the tip of the xiphoid process.

3. Place the other hand directly on top of the first.

4. Press into the abdomen with quick upward thrusts up to five times.

(b) Chest thrusts.

1. Kneel close to either side of the casualty's body.

2. With the middle and index fingers of the hand nearest the casualty's legs, locate the lower margin of the casualty's rib cage on the side nearest you.

3. Move the fingers up the rib cage to the notch where the ribs meet the sternum in the center of the lower part of the chest.

4. With the middle finger on this notch, place the index finger next to it on the lower end of the sternum.

5. Place the heel of the other hand on the lower half of the sternum next to the index finger of the first hand.

6. Remove the first hand from the notch and place it on top of the hand on the sternum so that the hands are parallel to each other.

NOTE: You may either extend or interlace your fingers but keep the fingers off the casualty's chest.

7. Lock your elbows into position, straighten your arms, and position your shoulders directly over your hands.

8. Press straight down depressing the sternum 1 1/2 to 2 inches and then release the pressure completely without lifting the hands from the chest.

9. Repeat the chest thrust up to five times.

NOTE: Make each thrust a separate, distinct movement given with the intent of relieving the obstruction.

(2) Perform a finger sweep.

(a) Open the casualty's mouth by grasping both the tongue and lower jaw with your thumb and fingers and lifting.

(b) Insert the index finger of your other hand down along the inside of the cheek and deeply into the throat to the base of the tongue.

(c) Use a hooking motion to attempt to dislodge the foreign body and maneuver it into the mouth for removal.

CAUTION

Do not force the object deeper into the airway.

(3) Attempt to ventilate. If the airway is still not clear, repeat the sequence of thrusts, finger sweep, and attempt to ventilate until the airway is cleared or you are relieved by qualified personnel.

2. When the object is dislodged, check for breathing. Perform rescue breathing, if necessary (see task 081-831-0048) or continue to evaluate the casualty for other injuries.

Evaluation Preparation

NOTE: Only the procedure for clearing an airway obstruction in a conscious casualty will be evaluated. The procedure for an unconscious casualty can be evaluated as a part of task 081-831-0048.

Setup: You will need another soldier to play the part of the casualty.

Brief soldier: Describe the symptoms of a casualty with good air exchange, poor air exchange, or a complete airway obstruction. Ask the soldier what should be done and score step 1 based on the answer. Then, tell the soldier to clear an upper airway obstruction. Tell the soldier to demonstrate how to position the casualty, where to stand, and how to position his or her hands for the thrusts. The soldier must tell you how they should be done and how many thrusts should be performed. Ensure that the soldier understands that he or she must not actually perform the thrusts. After completion of step 5, ask the soldier what must be done if the casualty becomes unconscious.

Evaluation Guide

Performance Measures	Results	
1. Determine whether the casualty needs help.	P	F
2. Move the casualty to a sitting or standing position, if necessary.	P	F
3. Stand behind the casualty.	P	F
4. Position arms and hands properly to perform the thrusts.	P	F
5. Tell how to perform the thrusts and how many should be performed.	P	F
6. State that the following actions would be taken if the casualty becomes unconscious.	P	F
a. Reposition the casualty.		
b. Perform a finger sweep.		
c. Open the airway.		
d. Perform rescue breathing procedures.		
7. Complete all necessary steps in order.	P	F

REFERENCES: None

081-831-0048

PERFORM RESCUE BREATHING

CONDITIONS

You are treating a casualty who is unconscious and is not breathing. You have opened the airway. You are not in an NBC environment.

STANDARDS

Complete, in order, all the steps necessary to restore breathing. Continue the procedure until the casualty starts to breathe or until you are relieved by another qualified person, stopped by a physician, required to perform CPR, or too exhausted to continue.

TRAINING/EVALUATION

Training Information Outline

1. Ventilate the casualty using the mouth-to-mouth or mouth-to-nose method, as appropriate.

NOTE: The mouth-to-nose method is recommended when you cannot open the casualty's mouth, there are jaw or mouth injuries, or you cannot maintain a tight seal around the casualty's mouth.

a. Mouth-to-mouth method.

(1) Maintain the chin-lift while pinching the nostrils closed using the thumb and index fingers of the hand on the casualty's forehead.

(2) Take a deep breath and make an airtight seal around the casualty's mouth with his or her mouth.

(3) Blow two full breaths (one and a half to two seconds each) into the casualty's mouth, taking a breath between them while watching for the chest to rise and fall and listening and feeling for air to escape during exhalation.

(4) If the chest rises and air escapes, go to step 4.

(5) If the chest does not rise or air does not escape, continue with step 2.

b. Mouth-to-nose method.

(1) Maintain the head-tilt with the hand on the forehead while using the other hand to lift the casualty's jaw and close the mouth.

(2) Take a deep breath and make an airtight seal around the casualty's nose with your mouth.

(3) Blow two full breaths (one and a half to two seconds each) into the casualty's nose, taking a breath between them while watching for the chest to rise and fall and listening and feeling for air to escape during exhalation.

NOTE: It may be necessary to open the casualty's mouth or separate the lips to allow air to escape.

(4) If the chest rises, go to step 4.

(5) If the chest does not rise, continue with step 2.

2. Reposition the head to ensure an open airway and repeat step 1, if necessary.

a. If the chest rises, go to step 4.

b. If the chest does not rise, continue with step 3.

3. Clear an airway obstruction, if necessary. (See task 081-831-0019.) When the obstruction has been cleared, continue with step 4.

4. Check the carotid pulse for 5 to 10 seconds.

a. While maintaining the head tilt with one hand, place the index and middle fingers of the other hand on the casualty's throat.

b. Slide the fingers into the groove beside the casualty's Adam's apple and feel for a pulse for 5 to 10 seconds.

c. If a pulse is present, go to step 5.

d. If a pulse is not found, begin CPR. (See task 081-831-0046.)

5. Continue rescue breathing.

a. Ventilate the casualty at the rate of about 10 to 12 breaths per minute.

b. Watch for rising and falling of the chest.

c. Recheck for pulse and breathing after every 12 breaths.

NOTE: Although not evaluated, continue rescue breathing as stated in the task standard. When breathing is restored, watch the casualty closely, maintain an open airway, and check for other injuries. (See task 081-831-0018.)

Evaluation Preparation

Setup: For training and evaluation, a CPR mannequin must be used. Position the mannequin on its back with its neck hyperextended. To test step 1, you may specify to the soldier whether to use the mouth-to-mouth or mouth-to-nose method, or you may create a scenario in which the casualty's condition dictates which method is to be used. You may determine how much of the task is tested by telling the soldier whether the airway is clear or a pulse is found as the soldier proceeds through the task. However, you should ensure that the soldier is routed through the task far enough to continue rescue breathing after checking the carotid pulse.

Brief soldier: Tell the soldier to perform rescue breathing.

Evaluation Guide

Performance Measures	**Results**	
1. Ventilate the casualty using the mouth-to-mouth or mouth-to-nose method, as appropriate.	P	F
2. Reposition the head to ensure an open airway and repeat step 1, if necessary.	P	F
3. Clear an airway obstruction, if necessary.	P	F
4. Check the carotid pulse for 5 to 10 seconds.	P	F
5. Continue rescue breathing.	P	F
6. Complete all necessary steps in order.	P	F

REFERENCES: None

081-831-0046

ADMINISTER EXTERNAL CHEST COMPRESSIONS

CONDITIONS

You are treating a casualty who is not breathing and has no pulse. The airway is open and is clear. Another soldier who is CPR qualified may be available to assist or may arrive while you are performing one-rescuer CPR. You are not in an NBC environment.

STANDARDS

Continue CPR until the pulse is restored or until the rescuer(s) is/are relieved by other qualified persons, stopped by a physician, or too tired to continue.

TRAINING/EVALUATION

Training Information Outline

A. Perform one-rescuer CPR.

1. Ensure that the casualty is positioned on a hard, flat surface.

2. Position the hands for external chest compressions.

a. With the middle and index fingers of the hand nearest the casualty's feet, locate the lower margin of the casualty's rib cage on the side near the rescuer.

b. Move the fingers up the rib cage to the notch where the ribs meet the sternum in the center of the lower part of the chest.

c. With the middle finger on the notch, place the index finger next to it on the lower end of the sternum.

d. Place the heel of the other hand on the lower half of the sternum, next to the index finger of the first hand.

e. Remove the first hand from the notch and place it on top of the hand on the sternum so that both hands are parallel to each other.

NOTE: You may either extend or interlace your fingers but keep the fingers off the casualty's chest.

3. Position the body.

a. Lock the elbows with the arms straight.

b. Position the shoulders directly over the hands.

4. Give 15 compressions.

a. Press straight down to depress the sternum 1 1/2 to 2 inches.

b. Come straight up and completely release pressure on the sternum to allow the chest to return to its normal position. The time allowed for release should equal the time required for compression.

CAUTION

Do not remove the heel of the hand from the casualty's chest or reposition the hand between compressions.

c. Give 15 compressions in 9 to 11 seconds (at a rate of 80 to 100 per minute).

5. Give two full breaths.

a. Move quickly to the casualty's head and lean over.

b. Open the casualty's airway. (See task 081-831-0018.)

c. Give two full breaths (1 1/2 to 2 seconds each).

6. Repeat steps A2 through A5 four times.

7. Assess the casualty.

a. Check for the return of the carotid pulse for three to five seconds.

(1) If the pulse is present, continue with step A7b.

(2) If the pulse is absent, continue with step A8.

b. Check breathing for three to five seconds.

(1) If breathing is present, monitor breathing and pulse closely.

(2) If breathing is absent, perform rescue breathing only. (See task 081-831-0048.)

8. Resume CPR with compressions.

9. Recheck for pulse every three to five minutes.

10. Continue to alternate chest compressions and rescue breathing until--

    a. The casualty is revived.

    b. You are too tired to continue.

    c. You are relieved by competent person(s).

    d. The casualty is pronounced dead by an authorized person.

    e. A second rescuer states, "I know CPR," and joins you in performing two-rescuer CPR.

NOTE: A qualified second rescuer joins the first rescuer at the end of a cycle after a check for pulse by the first rescuer. The new cycle starts with one ventilation by the first rescuer, and the second rescuer becomes the compressor. Two-rescuer CPR is then initiated.

B. Two-rescuer CPR.

1. Compressor: Give five chest compressions at the rate of 80 to 100 per minute.

   Ventilator: Maintain an open airway and monitor the carotid pulse occasionally for adequacy of chest compressions.

2. Compressor: Pause.

   Ventilator: Give one full breath (one and a half to two seconds).

3. Compressor: Continue to give chest compressions until a change in positions is initiated.

   Ventilator: Continue to give ventilations until the compressor indicates that a change is to be made.

4. Compressor: Give a clear signal to change positions.

   Ventilator: Remain in the rescue breathing position.

5. Compressor: Give the fifth compression.

   Ventilator: Give the breath following the fifth compression.

6. Compressor and ventilator simultaneously switch positions.

7. New Ventilator: Check the casualty's carotid pulse for five seconds.

   a. If present state, "There is a pulse," and perform rescue breathing.

b. If not present state, "No pulse." Give the casualty one breath and tell the new compressor to give chest compressions.

New compressor: Position the hands to begin chest compressions as directed by the ventilator.

8. Ventilator: Continue to give one breath on each fifth upstroke of chest compressions and ensure that the chest rises.

Compressor: Continue to give chest compressions at the rate of 80 to 100 per minute.

NOTE: If signs of gastric distension are noted, do the following:

1. Recheck and reposition the airway.
2. Watch for the rise and fall of the chest.
3. Ventilate the casualty only enough to cause the chest to rise.

CAUTIONS

1. Do not push on the abdomen.
2. If the casualty vomits, turn the casualty on the side, clear his airway, and then continue CPR.

9. Continue to perform CPR as stated in the task standard.

NOTE: The rescuer doing rescue breathing should recheck the carotid pulse every three to five minutes.

10. When the pulse and breathing are restored, continue to evaluate the casualty. If the casualty's condition permits, place him or her in the recovery position. (See task 081-831-0018.)

CAUTION

During evacuation CPR or rescue breathing should be continued en route, if necessary. When the pulse and breathing are restored, the casualty should be watched closely.

Evaluation Preparation

Setup: For training and evaluation a CPR mannequin must be used. Place the mannequin face up on the floor. One-rescuer CPR, two-rescuer CPR, or a combination of both (see NOTE after step A10) can be evaluated. If two soldiers are involved, they will be designated as "rescuer #1" and "rescuer #2." Rescuer #1 will start in the chest compression position and will be the only one scored during performance of the task. The evaluator will ensure that all aspects of the task are evaluated by indicating whether pulse is present and when the rescuers should change positions.

Brief soldier: If two soldiers are involved, tell them about their roles as rescuer #1 and #2. Ask rescuer #1 on what kind of surface the casualty should be positioned. Then, tell the soldier(s) to perform one-rescuer or two-rescuer CPR, as appropriate.

Evaluation Guide

Performance Measures	**Results**	
1. Position casualty on a hard, flat surface.	P	F
2. Properly position your hands during chest compressions.	P	F
3. Administer the correct number of chest compressions.	P	F
4. Give chest compressions at the rate of 80 to 100 per minute.	P	F
5. Administer the correct number of breaths.	P	F
6. Give the breaths at the correct rate.	P	F
7. Check the carotid pulse for about five seconds approximately one minute after starting CPR.	P	F
8. Recheck the carotid pulse every three to five minutes.	P	F
9. Perform transition to two-rescuer CPR correctly, if applicable.	P	F
10. Change position during two-rescuer CPR correctly, if applicable.	P	F
11. Continue CPR as stated in the task standard.	P	F

REFERENCES: None

081-833-0007

ESTABLISH A STERILE FIELD

CONDITIONS

You have performed a patient care handwash. Necessary materials and equipment: sterile packs, sterile drapes and towels, small solution basin, sterile liquids, sterile needles and syringes, sterile gloves, and a flat, clean, dry surface.

STANDARDS

Establish a sterile field. Add items and liquids without violating aseptic technique.

TRAINING/EVALUATION

Training Information Outline

1. Obtain sterile equipment and supplies IAW local SOP.

2. Select a flat, clean, dry surface.

NOTE: Choose a surface away from drafts, if possible.

3. Create a sterile field with a double-wrapped sterile package.

a. Lift the top flap of the sterile pack away from the body without crossing the hand or arm over the sterile field.

b. Lift the remaining flaps, one at a time, away from the center without crossing the hand or arm over the sterile field.

4. Add sterile items to the sterile field.

NOTE: The outer one-inch border of the sterile field is considered contaminated. Items that fall in that area are considered contaminated and should not be used. If an item rolls from the one-inch border onto the sterile field, the sterile field is considered contaminated and the procedure must be stopped immediately. The procedure must be repeated using a new sterile pack.

a. Commercially prepacked items.

(1) Keeping the hands on the outside of the sterile wrapper, grasp the opening edge of the package.

(2) Carefully fold each end of the wrapper back toward the wrist.

(3) Without contaminating the contents, drop them onto the sterile field.

NOTE: If the wrapper has been punctured or torn, the item is no longer sterile.

b. Centralized Materiel Section (CMS) items (wrapped in double muslin wrappers).

(1) Remove the outer wrapper.

(2) Grasp the edge of the item being unwrapped, keeping the hand on the outside of the inner wrapper.

(3) Fold each edge of the wrapper slowly back over the wrist of the hand holding the item.

(4) Drop the item onto the sterile field.

5. Open sterile liquids.

NOTE: Liquids prepared in CMS are considered sterile if a vacuum release sound is heard when the bottle is opened. If there is no sound, the bottle is considered unsterile, and a new bottle must be obtained before continuing the procedure.

NOTE: Some commercially prepared bottles of sterile solution may not make a vacuum release sound.

a. Remove the outer protective bottle seal, if necessary, and remove the cap.

b. Hold the cap in one hand, or place the cap so the top rests on the table.

NOTE: The bottle rim and inside of the cap are considered sterile.

CAUTION

Discard the sterile solution under any of the following conditions:

1. Anyone touches the bottle rim.
2. The lip of the bottle touches nonsterile items.
3. Someone touches the inside of the cap, or the part of the cap that touches the container is placed on the table.

6. Pour sterile liquids.

a. Hold the bottle with the label against the palm.

b. Pour a small amount of the liquid from the bottle into a waste receptacle.

c. Hold the bottle about 6 inches above the container into which the liquid is to be poured.

d. Slowly pour a steady stream to avoid splashing, thus preventing contamination.

e. Replace the cap without contaminating the bottle.

f. Write the date and time the bottle was opened and your initials on the label. Return the bottle to the storage area or discard it IAW local SOP.

NOTE: If the sterile field is contaminated at any time, the procedure must be stopped immediately. Repeat all steps using new sterile equipment.

Evaluation Guide

Performance Measures	**Results**	
1. Obtain sterile equipment and supplies IAW local SOP.	P	F
2. Select a flat, clean, dry surface.	P	F
3. Create a sterile field with a double-wrapped sterile package.	P	F
4. Add sterile items to the sterile field.	P	F
5. Open sterile liquids.	P	F
6. Pour sterile liquids.	P	F
7. Do not violate aseptic technique.	P	F

REFERENCES: None

081-833-0088

PREPARE AN INJECTION FOR ADMINISTRATION

CONDITIONS

You have performed a patient care handwash. Necessary materials and equipment: needles and syringes, medication, alcohol sponges, dry sterile gauze, and physician's order.

STANDARDS

Select, inspect, and assemble the appropriate needle and syringe. Draw the correct medication. Follow aseptic technique throughout the procedure.

TRAINING/EVALUATION

Training Information Outline

1. Select an appropriate needle.

    a. Select a needle with the proper length based upon the following factors:

        (1) The type of injection to be given (subcutaneous, intramuscular, or intradermal).

        (2) The size of the patient (thin, obese).

        (3) The injection site (one inch for deltoid, 1 1/2 inches for gluteus maximus).

    b. Select a needle with the proper gauge based upon the thickness of the medication to be injected.

NOTE: The gauge of the needle is indicated by the numbers 14 through 27. The higher the number, the smaller the diameter (bore) of the needle. A small bore needle is indicated for thin medications. A large bore needle is indicated for thick medications.

2. Select an appropriate syringe.

    a. Check the drug manufacturer's specifications to determine whether a glass or plastic syringe should be used for the medication.

NOTE: Some medications deteriorate in a plastic syringe. Drug manufacturer's specifications provide guidance.

    b. Ensure that the total capacity of the syringe, usually measured in cubic centimeters (cc), is appropriate for the amount of medication to be administered.

    c. Check the intervals of the calibration marks on the syringe.

3. Inspect the needle and syringe packaging for defects such as open packages, holes, and water spotting. Discard the equipment if any defect is found.

4. Unpack the syringe.

a. If the syringe is in a flexible wrapper, peel the sides of the wrapper apart to expose the rear end of the syringe barrel.

b. Grasp the syringe by the barrel with the free hand.

CAUTION

The needle adapter and the shaft of the plunger are sterile. Contamination could cause infection in the patient. The outside of the syringe barrel does not have to be kept sterile.

c. Pull the syringe from the packaging.

d. If the syringe is packaged in a hard plastic tube container, press down and twist the cap until a distinct "pop" is heard. If the "pop" is not heard, the seal has been previously broken and the equipment must be discarded.

5. Inspect the syringe.

a. Grasp the flared end of the syringe and pull the plunger back and forth to test for smooth, easy movement.

b. Visually check the rubber stopper (inside the syringe) to ensure that it is attached securely to the top end of the plunger, forming a seal.

c. If the plunger is stuck or does not move smoothly, discard the syringe.

d. Push the plunger fully into the barrel until ready to fill the syringe with medication.

6. Unpack the needle.

CAUTION

All parts of the needle are sterile. Be careful not to touch the hub. This would contaminate the needle and possibly pass an infection to the patient. Only the outside of the needle cover may be touched.

a. If the needle is packaged in a flexible wrapper, peel the sides of the wrapper apart to expose the needle hub.

b. If the needle is packaged in a hard plastic tube, twist the cap of the tube until a "pop" is heard. Remove the cap to expose the needle hub. If a "pop" is not heard, the seal has been previously broken, and the equipment must be discarded.

7. Join the needle and the syringe.

a. Insert the needle adapter of the syringe into the hub of the needle.

b. Tighten the needle by turning one fourth of a turn to ensure that it is securely attached.

8. Inspect the needle.

a. Hold the needle and syringe upright and remove the protective cover from the needle by pulling it straight off.

NOTE: A twisting motion may pull the needle off the hub.

b. Visually inspect the needle for burrs, barbs, damage, and contamination. If the needle has any defects or damage, replace it with another sterile needle.

c. Place the protective cover back on the needle.

9. Place the assembled needle and syringe on the work surface.

a. Leave the protective cover on the needle.

b. Leave the plunger pushed fully into the barrel.

c. Keep the assembled needle and syringe continually within range of vision.

NOTE: When you assemble a needle and syringe, you are responsible for maintaining sterility and security of the equipment.

10. Verify the drug label and check the container for defects.

a. Compare the medication with the doctor's orders. The medication label must be verified three times.

(1) When obtained from the place of storage.

(2) When withdrawing the medication.

(3) When returning the container to storage.

b. Examine the container.

(1) Examine the rubber stopper for defects, such as small cores or plugs torn from the stopper.

(2) Hold the vial to the light to check for foreign particles and changes in color and consistency. If the solution is in a dark vial, withdraw some solution to perform the checks.

(3) Check the date a multidose vial was opened and check the expiration date of the medication.

(4) Determine whether the medication was stored properly, such as under refrigeration.

NOTE: If there is any evidence of contamination, discard the container and obtain another.

11. Prepare and draw the medication.

a. Draw medication from a stoppered vial which contains a prepared solution.

(1) Remove the protective cap.

(2) Clean the stopper and neck of the vial with an alcohol sponge.

(3) Pick up the assembled needle and syringe and remove the protective needle cover.

(4) Slowly draw the plunger to the prescribed cc mark of medication.

(5) Pick up the vial and insert the needle into the rubber stopper, exerting slight downward and forward pressure. Ensure that the needle tip passes completely through the cap.

NOTE: To avoid contamination, the hub of the needle should not touch the rubber cap.

(6) Push the plunger fully into the barrel to inject the air.

(7) With the vial inverted (and keeping the needle tip in the solution), pull the plunger back to the desired cc mark, withdrawing the medication.

(8) Withdraw the needle from the container.

(9) Verify the correct dosage against the doctor's orders by raising the syringe to eye level and ensuring that the forward edge of the plunger is exactly on the prescribed cc mark.

b. Draw medication from a stoppered vial which contains a powdered medication which must be prepared.

(1) Remove the protective caps from the vial containing the powdered medication and the vial containing the sterile diluent.

(2) Clean the stoppers of both vials with alcohol sponges.

(3) Withdraw the required diluent, using the same procedure as for a stoppered vial. (See steps 11a(3) through 11a(8).)

(4) Hold the vial with the powdered medication horizontally, insert the needle through the stopper, and inject the diluent.

NOTE: If the vial with powdered medication contains air, the diluent may be difficult to inject. Air may have to be withdrawn to allow the diluent to be injected.

(5) Withdraw the needle.

(6) Gently invert the vial several times until all the powder is dissolved. Visually inspect the solution to ensure that it is well-mixed.

(7) Change the needle (or needle and syringe) and insert it into the vial of reconstituted solution.

(8) Withdraw the prescribed amount of medication. (See step 11a(7).)

(9) Withdraw the needle from the container.

(10) Verify the correct dosage. (See step 11a(9).)

c. Draw medication from an ampule.

(1) Lightly tap the upright ampule to force any trapped medication from the ampule neck and top.

(2) Clean the neck of the ampule with an alcohol sponge and wrap it with the same sponge.

(3) Grasp the ampule with both hands and snap the neck by bending it away from the breakline--directing it away from you and others.

(4) Inspect the ampule for minute glass particles. If any are found, discard the ampule.

(5) Remove the protective cover from the assembled needle and syringe.

(6) Insert the needle and withdraw the medication by holding the ampule vertically or by placing the ampule upright on a flat surface.

(7) Withdraw the prescribed medication, being careful not to touch the outside edge or bottom of the ampule with the needle.

(8) Withdraw the needle and verify the correct dosage. (See step 11a(9).)

12. Check the syringe for air bubbles.

    a. Hold the syringe with the needle pointing up.

    b. Pull back on the plunger slightly to clear all the medication from the needle shaft.

    c. Tap the barrel lightly to force bubbles to the top of the barrel.

    d. Pull the plunger back slightly and push it forward until the solution is in the needle hub, clearing it of bubbles.

13. Reverify the correct dosage. (See step 11a(9).)

14. Cover the needle with the protective needle cover.

Evaluation Preparation

Setup: If the performance of this task must be simulated for training and evaluation, colored solutions may be used to simulate medications. Have several sizes of needles and syringes available. Tell the soldier what type of medication is being simulated and what the route of administration would be. Have him or her select the appropriate needle and syringe. To test step 2, tell the soldier of any manufacturer's specifications. Testing may be varied by using various medications to be administered by different routes. Needles and syringes may be reused.

Brief soldier: Tell the soldier to assemble the proper needle and syringe and draw the medication.

Evaluation Guide

Performance Measures	Results	
1. Select the appropriate needle.	P	F
2. Select the appropriate syringe.	P	F
3. Inspect the packaging for defects.	P	F
4. Unpack the syringe.	P	F
5. Inspect the syringe.	P	F
6. Unpack the needle.	P	F
7. Join the needle and syringe.	P	F
8. Inspect the needle.	P	F
9. Place the assembled needle and syringe on the work surface.	P	F
10. Verify the drug label and check the container for defects.	P	F
11. Prepare and draw the medication.	P	F
12. Check the syringe for air bubbles.	P	F
13. Reverify the correct dosage.	P	F
14. Cover the needle with the protective needle cover.	P	F
15. Do not violate aseptic technique.	P	F

REFERENCES: None

081-833-0031

INITIATE TREATMENT FOR ANAPHYLACTIC SHOCK

CONDITIONS

Necessary materials and equipment: needle, syringe, epinephrine (1:1000 solution), stethoscope, sphygmomanometer, bag-valve-mask system, and oxygen equipment.

STANDARDS

Initiate treatment for anaphylactic shock, stabilizing the casualty and minimizing the effects of anaphylaxis without causing further injury to the casualty.

TRAINING/EVALUATION

Training Information Outline

NOTE: Anaphylactic reactions occur within minutes or even seconds after contact with the substance to which the casualty is allergic. Reactions occur in the skin, respiratory system, and circulatory system.

1. Check the casualty for signs and symptoms of anaphylactic shock.
    a. Skin.
        (1) Flushed or ashen.
        (2) Burning or itching.
        (3) Edema (swelling), especially in the face, tongue, or airway.
        (4) Urticaria (hives) spreading over the body.
        (5) Marked swelling of the lips and cyanosis about the lips.
    b. Respiratory.
        (1) Tightness or pain in the chest.
        (2) Sneezing and coughing.
        (3) Wheezing and difficulty in breathing (dyspnea).
        (4) Sputum (may be blood tinged).

(5) Laryngospasms.

(6) Glottitis.

(7) Respiratory failure.

c. Circulatory.

(1) Weak, rapid pulse.

(2) Falling blood pressure.

(3) Hypotension.

(4) Dizziness or fainting.

(5) Coma.

2. Transport the casualty to the aid station.

WARNING

Do not attempt to transport the casualty to an aid station unless the station can be reached within four minutes. Otherwise, start supportive treatment immediately and transport the casualty as soon as possible.

3. Open the airway, if necessary.

NOTE: In cases of airway obstruction from severe glottic edema, a cricothyroidotomy may be necessary.

4. Administer oxygen.

NOTE: If the anaphylaxis is due to insect bite or sting on an extremity, a constricting band should be applied 4 to 5 inches above the site for 15 to 20 minutes. The band should then be released for three to five minutes and reapplied if the reaction continues. The band should be loose enough to allow arterial flow but tight enough to restrict venous circulation. A distal pulse must be palpable.

5. Initiate an IV lifeline.

6. Administer epinephrine.

a. Administer 0.5 ml of epinephrine, 1:1000 solution, subcutaneously (SQ) or intramuscularly (IM).

NOTE: Annotate the time of injection on the Field Medical Card (FMC).

b. Additional epinephrine may be required as anaphylaxis progresses. Additional incremental doses may be administered every 5 to 15 minutes IAW local SOP.

7. Provide supportive measures for the treatment of shock, respiratory failure, circulatory collapse, or cardiac arrest.

a. Infuse additional IV fluid if blood pressure continues to drop.

b. Position the patient in the supine position with legs elevated if injuries permit.

c. Apply pneumatic anti-shock garment, if necessary.

d. Administer external chest compressions, if necessary.

8. Check the casualty's blood pressure every 5 to 10 minutes until the casualty is stable.

9. Record the procedure on the appropriate form.

10. Evacuate the casualty, providing supportive measures en route.

Evaluation Guide

Performance Measures	Results	
1. Check the casualty for signs and symptoms of anaphylactic anaphylactic shock.	P	F
2. Transport the casualty to the aid station.	P	F
3. Open the airway, if necessary.	P	F
4. Administer oxygen.	P	F
5. Initiate an IV lifeline.	P	F
6. Administer epinephrine.	P	F
7. Provide supportive measures for the treatment of shock, respiratory failure, circulatory collapse, or cardiac arrest.	P	F
8. Check the casualty's blood pressure every 5 to 10 minutes until the casualty is stable.	P	F
9. Record the procedure on the appropriate form.	P	F
10. Evacuate the casualty, providing supportive measures en route.	P	F

REFERENCES: None

081-830-3008

CLEAN A FIBEROPTIC BRONCHOSCOPE

CONDITIONS

Necessary materials and equipment: 4 x 4 gauze sponges, 10% betadine solution, 70% ethyl alcohol, concentrated betadine solution, sterile water, warm water, cleaning brush, nonabrasive cleaning pad, carrying case, work area with sink, sterile towel, a clean dry cloth, three 10 cc syringes, and an appropriate soakage container.

STANDARDS

Clean a bronchoscope without damaging it.

TRAINING/EVALUATION

Training Information Outline

1. Place the bronchoscope on a table draped with a clean dry cloth in the designated cleaning area.

2. Mix one part 10% betadine solution with one part warm water to prepare the cleaning solution.

3. Clean the bronchoscope with the cleaning solution.

   a. Dip a 4 x 4 gauze sponge in the cleaning solution.

   b. Wipe the length of the scope, beginning at the distal end of the insertion tube, and discard the gauze sponge. (See Figure 3-2.)

Figure 3-2

c. Repeat steps 3a and 3b two more times.

d. Hook up a 10 cc syringe to the biopsy port. (See Figure 3-3.)

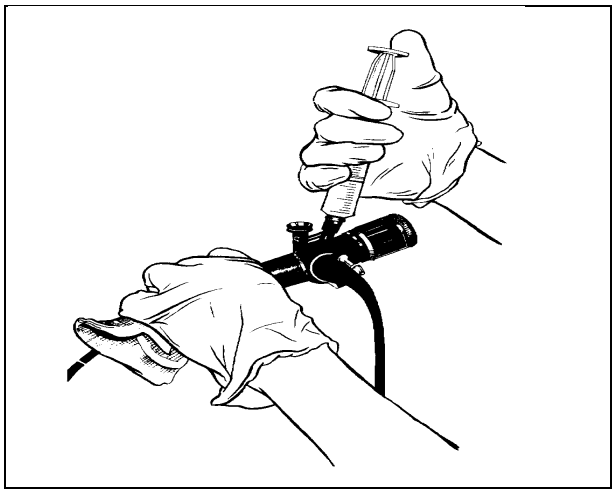


Figure 3-3

e. Place the tip of the scope into the cleaning solution. (See Figure 3-4.)

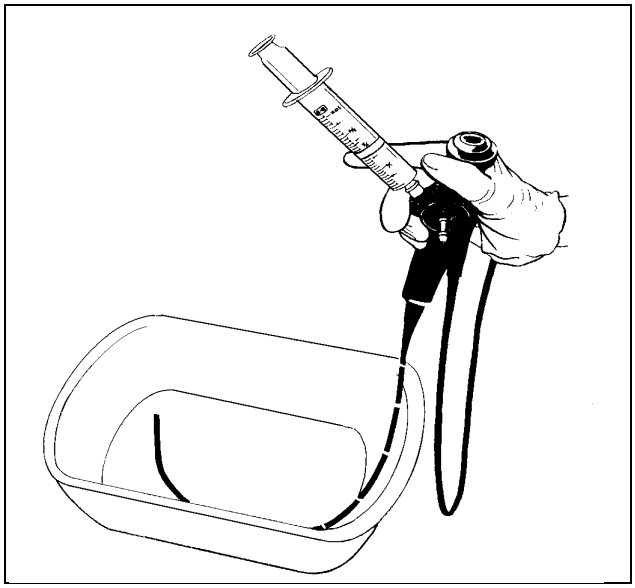


Figure 3-4

f. Suction the channel at least three times with the 10 cc syringe.

g. Disconnect and discard the syringe.

h. Pass a cleaning brush through the biopsy port the entire length of the channel until the brush can be seen at the lens end. (See Figure 3-5.)

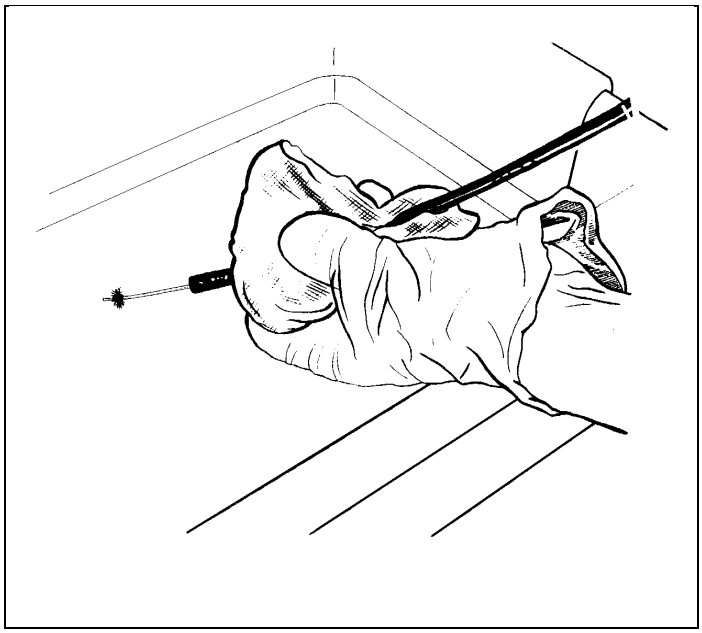


Figure 3-5

i. Repeat step 3h two more times.

j. Clean the ocular lens and the distal tip lens with a nonabrasive cleaning pad.

4. Disinfect the bronchoscope for sterilization.

NOTE: Do not use a premixed disinfectant that is more than six days old. If disinfectant solution must be prepared, mix two parts betadine with one part tap water and one part 70% ethyl alcohol.

a. Draw 10 cc of the disinfectant solution into a sterile syringe.

b. Connect the filled syringe to the biopsy port.

c. Push the disinfectant solution through the bronchoscope and out into the sink.

d. Position the insertion tube into the soakage container filled with the disinfectant solution.

e. Draw 10 cc of disinfectant solution into the syringe.

f. Allow the bronchoscope to soak for at least 20 minutes. (See Figure 3-6.)

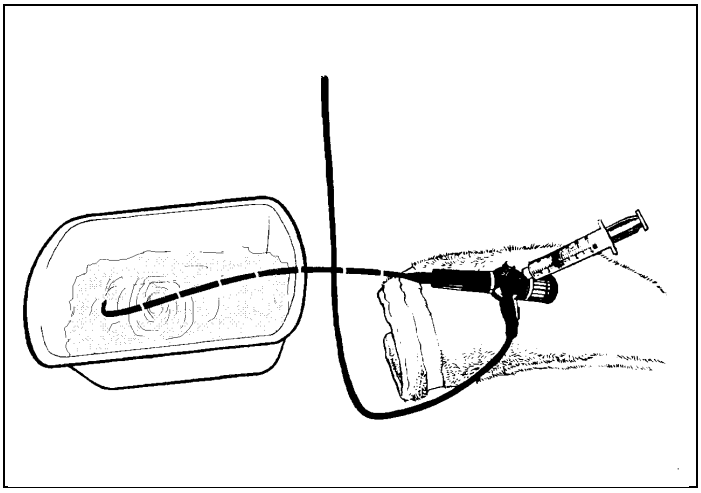


Figure 3-6

CAUTION

The head of the scope should never be rinsed under a faucet or submerged in any solution.

g. Remove and discard the syringe.

h. Attach a clean 10 cc syringe to the biopsy port and place the tip of the scope in a container of sterile water.

i. Suction the channel with the 10 cc syringe until the suctioned sterile water is clear.

j. Remove and discard the syringe.

k. Place the bronchoscope on a table draped with a sterile towel.

l. Wipe the bronchoscope with a 4 x 4 gauze sponge dampened with sterile water.

m. Air-dry the bronchoscope.

5. Place the bronchoscope in its carrying case.

6. Send the bronchoscope to CMS for ethylene oxide (ETO) sterilization only IAW local SOP.

CAUTION

Never sterilize the fiberoptic bronchoscope in an autoclave or boiling water.

Evaluation Guide

Performance Measures	**Results**	
1. Place the bronchoscope on the table in the designated cleaning area.	P	F
2. Prepare the cleaning solution.	P	F
3. Clean the bronchoscope.	P	F
4. Disinfect the bronchoscope.	P	F
5. Place the scope in carrying case.	P	F
6. Sterilize the bronchoscope.	P	F

REFERENCES: None

081-830-3005

PERFORM AUSCULTATION OF THE LUNGS

CONDITIONS

You have performed a patient care handwash and have obtained the physician's order. Necessary materials and equipment: consultation form, stethoscope, cleaning solution, and cloth.

STANDARDS

Identify and locate normal and abnormal breath sounds correctly.

TRAINING/EVALUATION

Training Information Outline

1. Read and verify the order on the consultation form.

2. Identify the patient by asking his or her name and checking his or her armband.

3. Explain the procedure to the patient and answer any questions he or she may have about the procedure.

4. Auscultate the patient's lungs.

    a. Instruct the patient to remove all clothing from the chest and back regions.

NOTE: If the therapist is male and the patient is female, a female chaperon must be present during the examination.

    b. Direct the patient to sit in an upright position.

NOTE: If the patient is unable to sit upright, position the patient first on one side and then on the other side.

    c. Tell the patient to inhale deeply and exhale slowly with his or her mouth open.

    d. Following the pattern of movement shown in Figure 3-7, move the bell or diaphragm of the stethoscope and compare the breath sounds of one side to the other.

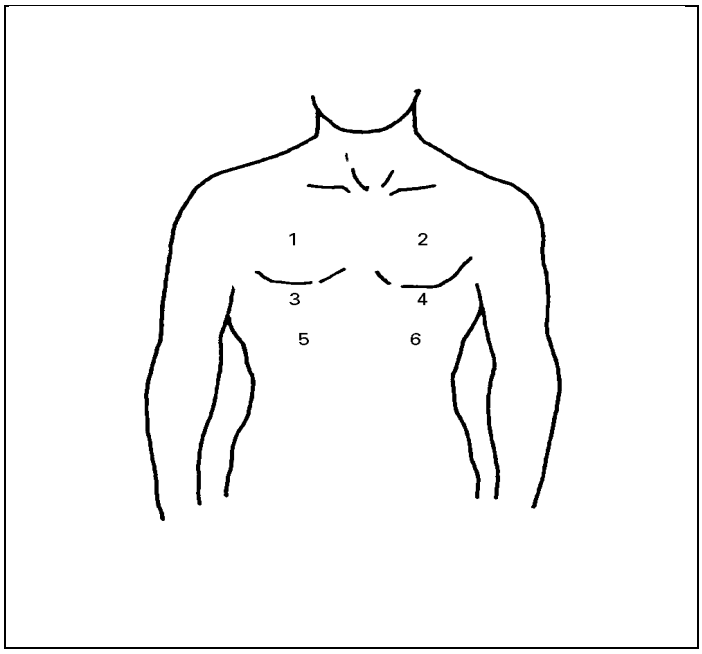


Figure 3-7

e. Auscultate both anteriorly and posteriorly, covering all lobes.

NOTE: Listen to at least one cycle of inspiration and expiration in each area of the chest, both anteriorly and posteriorly.

f. Note the presence or absence of normal breath sounds in each lobe.

NOTE: Unless the patient has had all or part of a lung removed, some sound should be heard during auscultation. Absence of sound indicates an abnormal condition such as atelectasis, pleural fluid, pneumothorax, or lung consolidation.

(1) A high pitched, harsh tubular sound may be heard over the mainstem bronchus.

(2) A moderate pitched, muffled blowing sound may be heard over the large air passages.

(3) A low pitched, soft rustling sound may be heard over the smaller air passages at the peripheral areas of the lungs.

g. Note the type and location of adventitious (abnormal) breath sounds.

(1) Rales--crackling or bubbly noises heard during inspiration and not cleared by coughing. This is commonly a result of air movement into alveoli or small airways containing fluid.

(2) Rhonchi--loud, low pitched, coarse sounds, like a snore, heard at any point during inspiration or expiration. This is commonly caused by accumulation of fluid or secretions in larger airways.

NOTE: Coughing may clear this if the sounds are caused by mucous accumulation in large airways.

(3) Wheeze--musical noise sounding like a squeak, usually louder during expiration than inspiration. The sound is produced by high velocity airflow through restricted passages.

(4) Pleural friction rub--a dry, rubbing or grating sound usually caused by inflammation of pleural surfaces. This will be heard during both inspiration and expiration.

(5) Stridor--high-pitched crowing, usually due to tracheal narrowing. Stridor may be the result of vocal cord edema, tracheal stenosis, epiglottis, tumor, or foreign body.

5. Instruct the patient to put his or her clothing back on.

6. Record the findings on the consultation form.

7. Clean the stethoscope bell with a cloth moistened with cleaning solution.

Evaluation Guide

Performance Measures	**Results**	
1. Read and verify orders.	P	F
2. Identify the patient.	P	F
3. Explain the procedure.	P	F
4. Auscultate the patients lungs.	P	F
5. Instruct the patient to replace his or her clothing.	P	F
6. Record the findings.	P	F
7. Clean the stethoscope.	P	F

REFERENCES: None

081-830-3003

INSTRUCT A PATIENT ON THE USE OF AN INCENTIVE SPIROMETER DEVICE

CONDITIONS

You have performed a patient care handwash and have obtained the physician's order. Necessary materials and equipment: consultation form, stethoscope, incentive spirometer device, tissues, sputum cup, and a pillow or blanket.

STANDARDS

Properly instruct the patient on the use of an incentive spirometer device without causing further injury.

TRAINING/EVALUATION

Training Information Outline

1. Read and verify the order on the consultation form.
2. Identify the patient by checking his or her armband.
3. Explain the procedure to the patient and answer any questions he or she may have about the procedure.

NOTE: The patient must be alert and oriented to properly perform the deep breathing maneuvers.

4. Gather and assemble the required equipment and supplies at the patient's bedside.
5. Auscultate the patient's lungs. (See task 081-830-3005.)
6. Position the patient in the upright sitting position in the bed or in a chair for maximal inspiratory effort.

NOTE: If the patient is unable to sit upright, raise his or her head and chest as high as possible.

7. Practice the procedure with the patient.

    a. Estimate a goal and preset the incentive spirometer device.

NOTE: The initial inspiratory goal should be twice the patient's measured tidal volume, but this may have to be increased or decreased to find an appropriate goal. An individual with normal lung expansion should be able to achieve an inspiratory capacity greater than 12 to 15 ml per kg of body weight.

    b. Tell the patient to hold the mouthpiece securely between the lips.

NOTE: At this time, explain the importance of maintaining a sustained maximal inhalation. A sustained maximal inspiration for 5 to 15 seconds will ensure maximum inflation and alveolar recruitment.

c. Instruct the patient to inhale as deeply as possible, thus attempting to reach or surpass the goal.

NOTE: The patient should be coached throughout the maneuver to inspire slowly (approximately 200 ml/sec).

d. Instruct the patient to relax and exhale normally.

NOTE: Exhalation below the functional residual capacity (FRC) will increase the work of breathing and cause small airway collapse.

e. Observe the patient repeating steps 7c and 7d several times until proficiency is shown.

8. Instruct the patient in the use of proper coughing techniques.

a. Provide the patient with tissues and a sputum cup.

b. Cover the wound site of a surgical patient with a pillow or rolled blanket and tell the patient to press the pillow or blanket against the wound site in order to decrease pain while coughing.

c. Tell the patient to take a deep breath and cough.

d. Encourage the patient to repeat steps 8b and 8c two more times.

9. Auscultate the patient's lungs. (See task 081-830-3005.)

10. Instruct the patient on periodic use of the incentive spirometer device that will be left at bedside.

a. Establish the minimum number of times the patient should practice each day.

NOTE: Instruct the patient to do the therapy every waking hour 6 to 10 times or as described in the physician's order. After each sustained maximal inhalation, the patient should wait at least 30 to 60 seconds to prevent hyperventilation. Evaluate the patient's goals and performance at least twice daily.

b. Encourage the patient to increase the effort each day by advancing the goal with the volume indicator.

11. Record the required observations.

a. Date, time, and length of current therapy.

b. Cough and sputum results.

c. Highest goal level obtained.

d. Future goals.

e. Breath sounds noted before and after the therapy.

f. Length of the patient's inspiratory hold.

g. Number of attempts.

h. Patient's tolerance to the therapy.

Evaluation Guide

Performance Measures	**Results**	
1. Read and verify the order.	P	F
2. Identify the patient.	P	F
3. Explain the procedure.	P	F
4. Gather and assemble equipment.	P	F
5. Auscultate the patient's lungs.	P	F
6. Position the patient.	P	F
7. Practice the procedure with the patient.	P	F
8. Instruct the patient on coughing techniques.	P	F
9. Auscultate the patient's lungs.	P	F
10. Instruct patient on periodic use of device.	P	F
11. Record observations.	P	F

REFERENCES: None

081-830-3007

ADMINISTER POSTURAL DRAINAGE AND PERCUSSION ON AN ADULT

CONDITIONS

You have performed a patient care handwash and have obtained the physician's order. Necessary materials and equipment: consultation form, towel, two pillows, patient's X-rays, sputum cups, box of tissues, stethoscope, and a bed.

STANDARDS

Administer postural drainage and percussion without causing further injury to the patient.

TRAINING/EVALUATION

Training Information Outline

1. Read and verify the order on the consultation form.

> **CAUTION**
>
> Chest physiotherapy is contraindicated for patients with tuberculosis, hemoptysis, or severe pain or discomfort. Consult with the physician prior to administering therapy.

2. Identify the patient by asking his or her name and by checking his or her armband.

3. Explain the procedure to the patient and answer any questions about the therapy.

4. Auscultate the patient's lungs. (See task 081-830-3005.)

5. Cover the affected area with a thin towel.

NOTE: If the area to be treated was not specified in the physician's order, consult with the physician or review the patient's X-rays to determine the affected area.

6. Place the patient in the proper position to drain the appropriate segment.

NOTE: See Figure 3-8 for an illustration of the various lung segments.

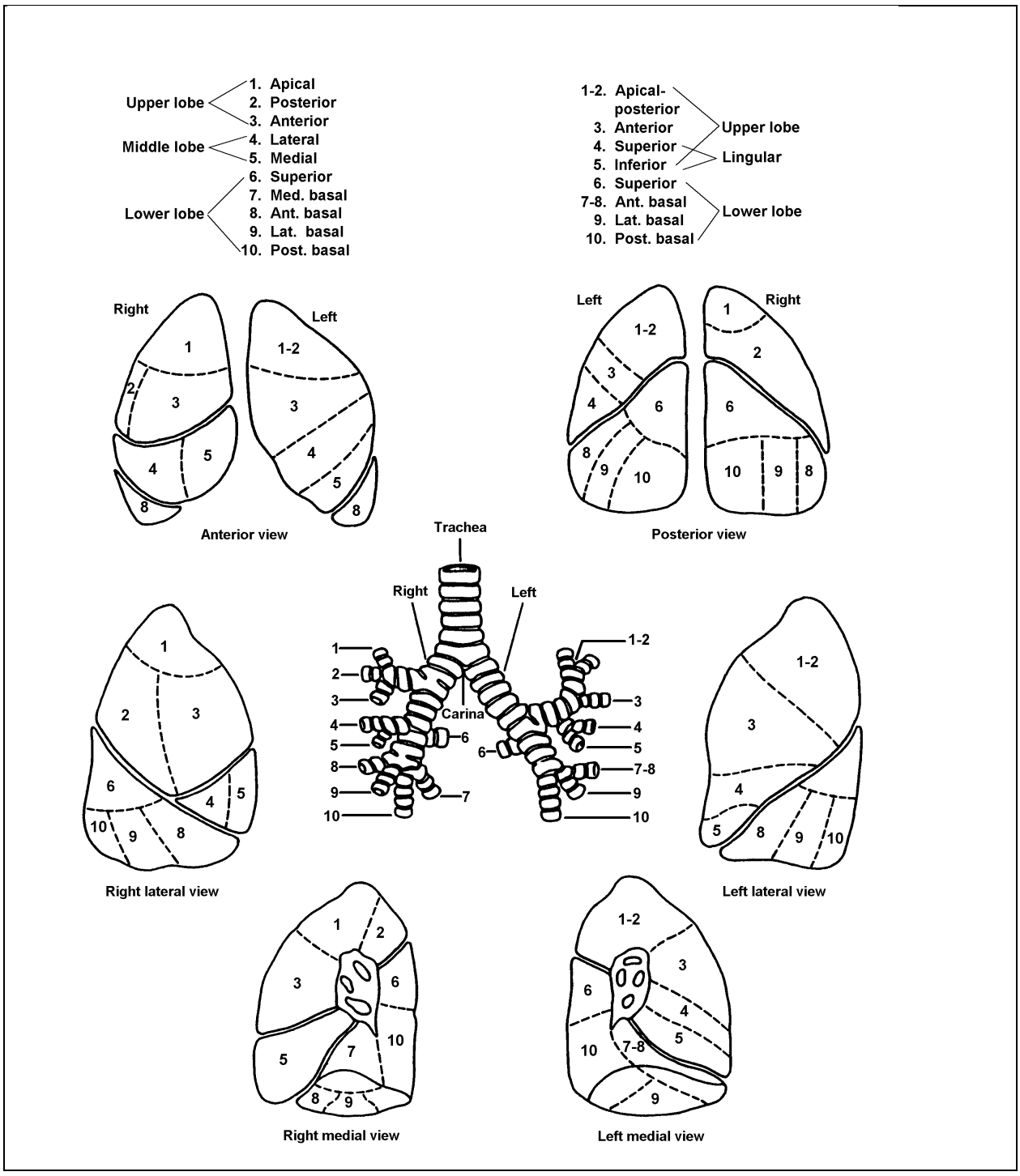

Upper lobe
1. Apical
2. Posterior
3. Anterior
Middle lobe
4. Lateral
5. Medial
Lower lobe
6. Superior
7. Med. basal
8. Ant. basal
9. Lat. basal
10. Post. basal
1-2. Apical-posterior
3. Anterior
4. Superior
5. Inferior
Upper lobe
Lingular
6. Superior
7-8. Ant. basal
9. Lat. basal
10. Post. basal
Lower lobe
Right
Left
Anterior view
Posterior view
Trachea
Carina
Right lateral view
Left lateral view
Right medial view
Left medial view

Figure 3-8

NOTE: Inform the patient that the postural drainage position is held for 15 minutes to 1 hour, depending on the patient's ability to stay in one position.

7. Perform the therapy. (See Figure 3-9.)

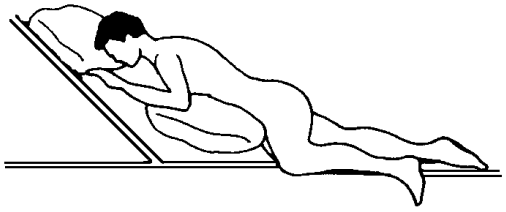
NOTE: Percussion therapy for each affected area will last three to five minutes. If pain or an adverse reaction is noted, stop the procedure. Avoid percussing over surgical wounds, breasts, floating ribs, and the spine.

Position 1. Right upper lobe, apical segment.

Sitting upright leaning slightly backward. Percussion is given below right clavicle.

Sitting upright, leaning slightly forward. Patient may lean forward, resting head and arms on table. Percussion is given above right clavicle.

Figure 3-9

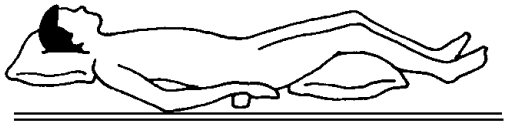


Position 2. Left upper lobe, apical-posterior segment.

Lying on right side with body turned forward 45°, pillow under left arm, and pillow under head, head of bed elevated about 45°. Percussion is given over left scapula.

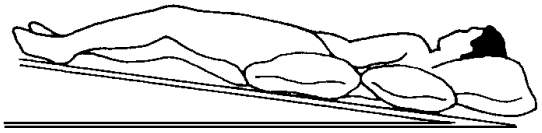
Position 3. Right upper lobe, posterior segment.

Lying on left side with body turned forward 45°, pillow under right arm, and pillow under head. Percussion is given over right scapula.



Position 4. Right and left upper lobes, anterior segments.

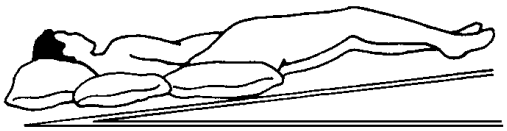
Supine with pillow under knees and pillow under head. Percussion is given several inches below clavicle.



Position 5. Left upper lobe, superior and inferior lingula.

Supine with body turned 45° to right with pillow under head, and pillow under left side of back from shoulder to hip. Foot of bed elevated, head lowered. Percussion is given below left nipple.

Figure 3-9 (Continued)

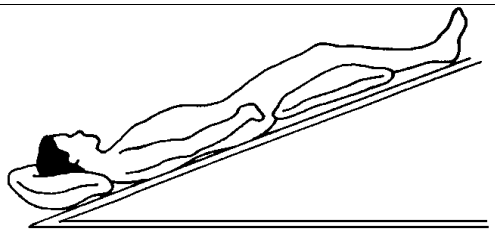


Position 6. Right middle lobe, medial and lateral segments.

Supine with body turned 45° to left with pillow under right side of back from shoulder to hip. Foot of bed elevated, head lowered. Percussion is given below right nipple.

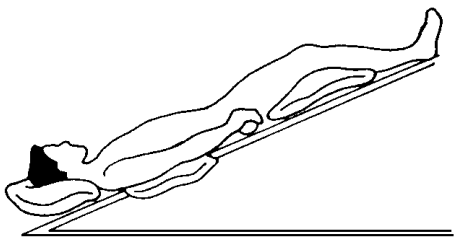
Position 7. Right and left lower lobes, superior segments.

Prone, pillow under lower abdomen and pillow under ankles. Percussion is given below both scapulas.



Position 8. Right lower lobe, medial basal segment.

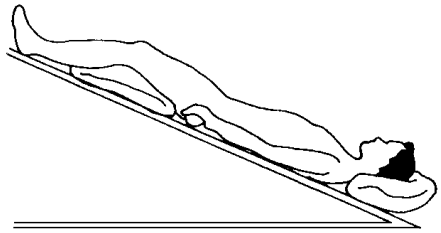
Supine with pillow under head and pillow under knees. Foot of bed elevated, head lowered. Percussion is given over right lower ribs.



Position 9. Right lower lobe, anterior basal segment.

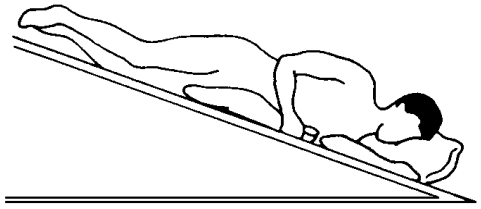
Supine with pillow under right side and pillow under head. Foot of bed elevated, head lowered. Percussion is given over right lower ribs.

Figure 3-9 (Continued)



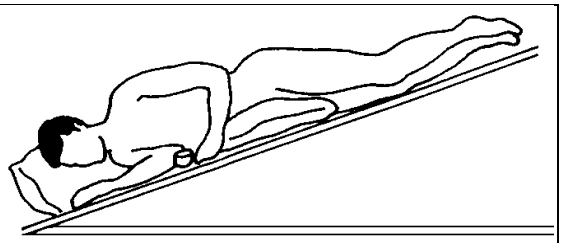
Position 10. Left lower lobe, anterior medial basal segment.

Supine with pillow under left side and pillow under head. Foot of bed elevated, head lowered. Percussion is given over left lower ribs.



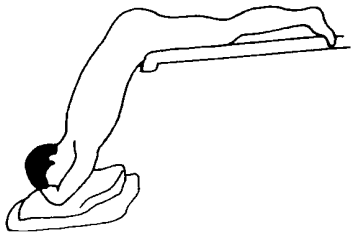
Position 11. Right lower lobe, lateral basal segment.

Lying on left side with pillow under head, and under body between hip and lower ribs. Knees flexed. Foot of bed elevated, head lowered. Percussion is given over right lower ribs.



Position 12. Left lower lobe, lateral basal segment.

Lying on right side with pillow under head, and under body between hip and lower ribs. Knees flexed. Foot of bed elevated, head lowered. Percussion is given over left lower ribs.



Position 13. Right and left lower lobes, posterior basal segment.

a. Prone with pillow under abdomen, foot of bed elevated and head lowered so that chest is 45° below horizontal (preferred method).
b. Prone over a frame made of wood in shape of an inverted V, angle 45°, covered with a mattress.
c. Prone across bed with trunk over edge, forearms resting on a pillow and head on hands. Percussion is given over lower ribs on both sides.

Figure 3-9 (Continued)

8. Vibrate the affected area.

a. Position the hands over the affected area so that the fingers are spread. One thumb is crossed over the other, and the index fingers are touching at the tips.

b. Direct the patient to take a slow, deep breath.

c. Direct the patient to exhale slowly through pursed lips.

d. Vibrate the affected area with both hands until the end of the patient's exhalation.

NOTE: Vibration is accomplished by either tensing the muscles causing "tremors" at the hands or by pushing up and down rapidly.

CAUTION

Do not pinch the patient's skin.

e. Repeat steps 8b through 8d two more times.

f. Direct the patient to resume normal breathing.

9. After the patient has remained in the postural drainage position for the prescribed time, return the patient to a normal resting position and readjust the bed.

10. Direct the patient to practice diaphragmatic breathing.

a. Tell the patient to place his or her hands on his or her abdomen.

b. Instruct the patient to inhale through his or her nose while moving the abdomen downward and outward.

c. Tell the patient to exhale slowly through his or her mouth with his or her lips pursed.

d. Repeat steps 10a through 10c at least two more times.

11. Direct the patient to initiate a cough at least three times. If sputum is produced, direct the patient to put it in a sputum cup.

NOTE: For a surgical patient have him or her hold a pillow over the abdomen or surgical site (splinting). Have tissues or an emesis basin for the patient to cough into.

12. Auscultate the patient's lungs. (See task 081-830-3005.)

13. Record the treatment results on the consultation form.

    a. Date and time.

    b. Type of treatment.

    c. Area of treatment (specify the lung segments).

    d. The patient's tolerance and status.

    e. Pre- and post-auscultation findings.

    f. Sputum observation.

    g. Signature.

Evaluation Preparation

Setup: This task should not be simulated. It must be performed on a patient.

Brief soldier: Tell the soldier to administer the postural drainage and percussion therapy.

Evaluation Guide

Performance Measures	**Results**	
1. Read and verify the orders.	P	F
2. Identify the patient.	P	F
3. Explain the procedure to the patient.	P	F
4. Auscultate the patient's lungs.	P	F
5. Cover the affected area with a thin towel.	P	F
6. Place the patient in the proper position.	P	F
7. Perform the therapy.	P	F
8. Vibrate the affected area.	P	F
9. Return the patient to the normal resting position and readjust the bed.	P	F
10. Direct the patient to practice diaphragmatic breathing.	P	F

Performance Measures	Results
11. Direct the patient to initiate a cough.	P F
12. Auscultate the patient's lungs.	P F
13. Record the treatment results.	P F

REFERENCES: None

081-830-3013

ASSESS A PATIENT'S VENTILATORY PARAMETERS AT BEDSIDE

CONDITIONS

You have performed a patient care handwash and have obtained the physician's order. Necessary materials and equipment: consultation form, respirometer, adapters, inspiratory effort manometer, and watch.

STANDARDS

Accurately assess the patient's ventilatory parameters without causing further injury or unnecessary discomfort to the patient.

TRAINING/EVALUATION

Training Information Outline

1. Read and verify the order on the consultation form.
2. Identify the patient by his or her armband.
3. Explain the procedure to the patient and answer any questions about the procedure.
4. Place the patient in the sitting position.

NOTE: If the patient is unable to sit, raise the head of the bed as high as possible and ensure that the difference in position is recorded.

5. Determine the patient's minute volume (MV).
   a. Disconnect the patient from the ventilator, if applicable.
   b. Attach the respirometer with the proper adapters to the patient's airway.
   c. Reset the respirometer to zero and tell the patient to breathe normally.
   d. Count the patient's respiratory rate (RR) while timing for one minute with a watch.
   e. Turn the respirometer off after one minute.
   f. Remove the respirometer with the adapters from the patient without resetting the respirometer.
   g. Reconnect the ventilator to the patient, if applicable, and inform the patient that one part of the test is completed.

h. Read the findings of the patient's MV on the respirometer and record the results.

NOTE: Allow the patient to rest before continuing with the procedure.

6. Calculate the tidal volume (VT) by dividing the MV by the number of respirations (MV divided by RR = VT).

7. Determine the patient's slow vital capacity (SVC).

NOTE: The procedure must be carefully reviewed with the patient because this test requires considerable effort by the patient.

a. Disconnect the ventilator from the patient, if applicable.

b. Attach the respirometer with the proper adapters to the patient's airway.

c. Reset the respirometer to zero and direct the patient to take a deep breath to fill his or her lungs to maximum.

d. Turn on the respirometer and direct the patient to slowly exhale all the air from his or her lungs.

NOTE: The therapist should strongly encourage the patient throughout the entire maneuver to achieve maximum results.

e. Turn the respirometer off and tell the patient to breathe normally.

f. Repeat steps 7a through 7e at least two more times.

g. Record the results of the best test.

h. Remove the respirometer with the adapters from the patient without resetting the respirometer.

i. Reconnect the ventilator to the patient, if applicable.

8. Determine the inspiratory effort (IE) of the patient.

a. Review the procedure with the patient and inform the patient that he or she will not be able to inhale during this test.

b. Disconnect the ventilator from the patient, if applicable.

c. Attach the inspiratory effort manometer to the patient and tell the patient to breathe normally.

d. Instruct the patient to exhale as completely as possible. The IE maneuver is done starting from residual volume (RV).

e. At the end of exhalation, occlude the inspiratory port.

f. Direct the patient to attempt to inhale as deeply as possible.

NOTE: Check for reduced respiratory muscle function by occluding the port for at least 15 seconds but not more than 30 seconds.

g. Remove the finger from the inspiratory port and tell the patient to breathe normally.

NOTE: The patient should be allowed to rest between the IE trials. If the patient was on the ventilator, it may be necessary to reconnect the patient during the rest period.

h. Repeat steps 8d through 8g two more times.

i. Make a notation of the results of each of the three trials from the manometer.

j. Disconnect the manometer from the patient and reconnect the ventilator, if applicable.

k. Record the best test reading.

NOTE: A healthy individual can generate more than -80 cm H_2O. The minimum criteria for weaning a patient from the ventilator is greater than -20 cm H_2O.

9. Inform the patient that the testing is complete.

10. Clean the equipment.

a. Wipe nondisposable items with a cloth dampened with the appropriate cleaner between each patient use or after every 24 hours of use.

b. Place disposable items in an infectious waste container after each patient use.

11. Record all of the results on the consultation form.

Evaluation Guide

Performance Measures	**Results**	
1. Verify the order.	P	F
2. Identify the patient.	P	F
3. Explain the procedure to the patient.	P	F
4. Place the patient in the sitting position.	P	F

Performance Measures	Results	
5. Determine the patient's minute volume.	P	F
6. Calculate the tidal volume.	P	F
7. Determine the patient's slow vital capacity.	P	F
8. Determine the inspiratory effort of the patient.	P	F
9. Inform the patient that the testing is complete.	P	F
10. Clean the equipment.	P	F
11. Record all of the results on the consultation form.	P	F

REFERENCES: None

081-833-0016

INSERT AN OROPHARYNGEAL AIRWAY (J TUBE)

CONDITIONS

You are surveying an unconscious casualty who requires insertion of an oropharyngeal airway. Necessary materials and equipment: three sizes of oropharyngeal airways, gloves, and gauze pads or tongue blades.

STANDARDS

Insert the correct size of oropharyngeal airway and make it functional without causing further injury to the casualty.

TRAINING/EVALUATION

Training Information Outline

WARNING

Use an oropharyngeal airway for an unconscious casualty only. Do not use it on a conscious or semiconscious casualty because he or she may still have a gag reflex.

1. Select the correct size of airway.

   a. Position the casualty's jaw in a normal closed mouth position.

   b. Place the airway beside the outside of the casualty's jaw.

   c. Ensure that the airway reaches from the corner of the casualty's mouth to the ear lobe.

NOTE: The measurement from the ear lobe to the corner of the casualty's mouth is equivalent to the depth of insertion in the airway.

2. Perform head-tilt/chin-lift to open the airway. (See task 081-831-0018.)

WARNING

If a neck or spinal injury is suspected, use the jaw thrust method to open the airway.

3. Open the casualty's mouth.

WARNING

Wear gloves for self-protection against transmission of contaminants whenever handling body fluids.

a. Place the crossed thumb and index finger of one hand on the casualty's upper and lower teeth at the corner of the mouth.

b. Use a scissors motion to pry the casualty's teeth apart.

NOTE: If the teeth are clenched, wedge the index finger behind the casualty's back molars to open the mouth.

4. Insert the airway.

a. Place the tip end of the airway into the casualty's mouth over the tongue.

b. Point the tip up toward the roof of the mouth.

c. Slide the J tube along the roof of the mouth. Follow the natural curvature of the tongue past the soft palate.

d. Rotate the airway 180° as the tip reaches the back of the tongue.

NOTE: The airway may be difficult to insert. If so, use a gauze pad to pull the tongue forward or a tongue blade to depress the tongue.

e. Gently advance the airway and adjust it so the flange rests on the casualty's lips.

NOTE: The tip of the airway should rest just above the epiglottis.

NOTE: If the flange of the airway did not seat correctly on the lips or if the casualty gags, the airway may be the wrong size. Repeat the procedure using a different airway.

WARNING

If the casualty starts to regain consciousness and gags or vomits, remove the airway immediately.

5. Evacuate the casualty.

NOTE: The airway may need to be taped or tied in place to avoid dislodgement during evacuation. If so, the casualty must be constantly monitored for the return of consciousness.

Evaluation Preparation

Setup: For training and evaluation, use a CPR mannequin capable of accepting an oropharyngeal airway.

Brief soldier: Tell the soldier that the simulated casualty is unconscious and breathing. Tell the soldier to insert an oropharyngeal airway.

Evaluation Guide

Performance Measures	**Results**	
1. Select the correct size of airway.	P	F
2. Perform head-tilt/chin-lift. (See task 081-831-0018.)	P	F
3. Open the casualty's mouth.	P	F
4. Insert the airway.	P	F
5. Evacuate the casualty.	P	F
6. Do not cause further injury to the casualty.	P	F

REFERENCES: None

081-833-0017

VENTILATE A PATIENT WITH A BAG-VALVE-MASK SYSTEM

CONDITIONS

Necessary materials and equipment: oropharyngeal airway, a bag-valve-mask (BVM) system, and oxygen (if available).

STANDARDS

Ventilate the patient with a bag-valve-mask system until spontaneous breathing returns, until a normal rate and depth of respiration is achieved, or until directed to stop by a physician. Perform the procedure without causing further injury to the patient.

TRAINING/EVALUATION

Training Information Outline

1. Insert an oropharyngeal airway, if the patient is unconscious. (See task 081-833-0016.)

WARNING

Do not attempt to use an oropharyngeal airway on a conscious or semiconscious patient.

2. Assemble the BVM, selecting the correct size of mask for the patient.

3. Ensure that the bag is operational.

4. Kneel behind the patient's head facing the patient's feet.

5. Fit the mask to the patient.

   a. Stretch the mask with the thumb and finger on both sides of the mask.

   b. Place the mask over the patient's face with the apex of the mask over the bridge of the patient's nose and the base of the mask in the groove between the lower lip and the chin to form a tight seal.

NOTE: As the stretched mask resumes its original shape, pull the patient's skin taut to help form a leakproof seal.

6. Hold the mask in place with one hand.

   a. Place the little, ring, and middle fingers along the mandible.

b. Place the thumb on the upper portion of the mask above the valve connection.

c. Place the index finger on the lower portion of the mask under the valve connection.

NOTE: Use the other hand to squeeze the bag.

d. Use firm pressure to hold the mask in position and to maintain the airway.

7. Ventilate the patient.

a. Squeeze the bag twice to administer two full breaths.

b. Maintain a leakproof mask seal with the other hand.

8. Observe the rise and fall of the patient's chest.

a. If the chest does not rise, reposition the airway.

b. If the chest rises and falls, continue with step 9.

9. Continue ventilations.

a. Squeeze the bag once every five seconds to achieve a rate of 12 ventilations per minute. (See Figure 3-10.)

Figure 3-10

(1) When the system is used to assist a spontaneously breathing patient, synchronize the ventilations with the patient's inhalations. Attempt to attain a more normal rate and depth of respiration.

(2) When this system is used in conjunction with external chest compressions, squeeze the bag between the fifth upstroke and the next downward stroke without interrupting the rhythm of external chest compressions.

b. Check the pulse.

c. Observe for vomiting or secretions in or around the mouth or mask.

NOTE: An oxygen source may be attached to the mask.

10. Continue ventilations until spontaneous breathing returns, until a more normal rate and depth of respiration is achieved, or until directed to stop by a physician.

11. Record the procedure on the appropriate form.

12. Evacuate the patient.

Evaluation Preparation

Setup: For training and evaluation, use a CPR mannequin capable of accepting an oropharyngeal airway. If oxygen will be used, prepare the oxygen source. Tell the soldier if oxygen is to be used and whether the patient is conscious or unconscious.

Brief soldier: Tell the soldier to ventilate the patient with a bag-valve-mask system. After two minutes of ventilation, tell the soldier that the patient has resumed normal breathing.

Evaluation Guide

Performance Measures	**Results**	
1. Insert an oropharyngeal airway, if the casualty is unconscious.	P	F
2. Assemble the BVM, selecting the correct size of mask for the patient.	P	F
3. Ensure that the bag is operational.	P	F
4. Kneel behind the patient's head facing the patient's feet.	P	F
5. Fit the mask to the patient.	P	F
6. Hold the mask in place with one hand.	P	F
7. Ventilate the patient.	P	F

Performance Measures	Results
8. Observe the rise and fall of the patient's chest.	P F
a. If the chest does not rise, reposition the airway.	
b. If the chest rises and falls, continue with step 9.	
9. Continue ventilations.	P F
10. Continue ventilations until spontaneous breathing returns, until a more normal rate and depth of respiration is achieved, or until directed to stop by a physician.	P F
11. Record the procedure on the appropriate form.	P F
12. Evacuate the patient.	P F
13. Do not cause further injury to the patient.	P F

REFERENCES: None

081-833-0021

PERFORM ORAL AND NASOTRACHEAL SUCTIONING OF A PATIENT

CONDITIONS

A patient requires suctioning. You have identified the patient, explained the procedure, and performed a patient care handwash. Necessary materials and equipment: suction apparatus, suction catheter and tubing, "Y" adapter/connector, sterile saline, sterile solution basin, and sterile gloves.

STANDARDS

Perform oral or nasotracheal suctioning without violating aseptic technique or causing injury to the patient.

TRAINING/EVALUATION

Training Information Outline

1. Position the patient in the semi-Fowler's (semi-sitting) position.

NOTE: In some cases, such as spinal injuries, the patient will have to remain in whatever position he or she is in at the time.

2. Check the pressure on the suction apparatus.

a. Turn the unit on, place a thumb over the end of the suction connecting tube, and observe the pressure gauge.

b. Ensure that the pressure reading is within the limits specified by local SOP and the recommendations of the equipment manufacturer.

c. Notify the supervisor if the pressure is not within the recommended limits.

d. Turn the unit off after verifying the correct pressure.

WARNING

If the suction pressure is too low, the secretions cannot be removed. If the pressure is too high, the mucous membranes may be forcefully pulled into the catheter opening.

3. Prepare the sterile materials. (See task 081-833-0007.)

a. Open the sterile solution basin package on the bedside stand or table to create a sterile field.

b. Pour sterile saline solution into the basin.

c. Open the suction catheter package to expose the suction port of the catheter.

d. Open the sterile glove package.

NOTE: Disposable suctioning kits contain the same items as a sterile, single-use kit prepared by CMS.

WARNING

Some patients should not receive increased oxygen. If the patient has a respiratory disease, check with the supervisor or physician.

4. Oxygenate the patient (tracheal suctioning only).

a. If the patient is on oxygen therapy, increase the oxygen to 100% for one minute.

b. If the patient is not on oxygen therapy, have him or her take a minimum of five deep breaths or administer them with a bag-valve-mask. (See task 081-833-0017.)

NOTE: After each suctioning attempt or suctioning period, reoxygenate the patient.

5. Put on sterile gloves.

6. Remove the catheter from the package using the dominant hand, keeping the catheter coiled to prevent contamination.

NOTE: This hand must remain sterile.

7. Grasp the suction connecting tubing with the other hand. Attach the tubing to the catheter.

NOTE: This hand does not have to remain sterile. The glove is for your protection.

8. Test the patency of the catheter.

a. Turn the suction unit on with the nonsterile hand.

b. Insert the catheter tip into the sterile saline solution using the sterile hand.

c. Place the nonsterile thumb over the suction port to create suction. Observe the saline entering the drainage bottle.

NOTE: If no saline enters the bottle, check the suction unit and/or replace the catheter and retest for patency.

9. Suction the patient.

a. Oral route.

NOTE: Instruct the patient to cough, if he or she is able. This helps to bring secretions up to the back of the throat.

(1) Insert the catheter into the patient's mouth, without suction applied.

NOTE: Hold the catheter with the sterile hand. Manipulate the suction connecting tubing and suction port with the nonsterile hand.

NOTE: If an oropharyngeal airway is in place, insert the catheter alongside the airway and then back into the pharynx.

(2) Place the thumb of your nonsterile hand over the suction control port on the catheter.

(3) Apply intermittent suction by moving your thumb up and down over the suction control port.

(4) Slowly and gently rotate the catheter between the thumb and index finger of your sterile hand as you withdraw the catheter.

WARNINGS

1. Advancing the catheter too far into the back of the patient's throat may stimulate the gag reflex. This could cause vomiting and the aspiration of stomach contents.
2. Do not continue suctioning for more than 10 to 15 seconds because it removes oxygen as well as secretions. Longer periods of continuous suctioning may cause oxygen deprivation.

(5) Rinse the catheter between suctionings by inserting the tip into the saline solution. Suction the solution through the catheter until the catheter is clear of secretions.

(6) Repeat steps 9a(1) through 9a(5) until all secretions have been removed or until the patient's breathing becomes easier. Noisy, rattling, or gurgling sounds should no longer be heard.

(7) Allow the patient to rest between each suctioning.

NOTE: If the patient is uncooperative, or oral entry is not possible due to injuries, nasopharyngeal suctioning may be required.

b. Nasopharyngeal route.

(1) Measure the catheter from the tip of the earlobe to the nose (approximately five inches).

(2) Lubricate the catheter by dipping the tip into the saline solution.

(3) Insert the catheter into one nostril without applying suction. If an obstruction is met, try the other nostril. If both are obstructed, seek assistance.

(4) Quickly and gently advance the catheter three to five inches.

(5) Perform steps 9a(2) through 9a(7) to suction secretions.

c. Nasotracheal route.

NOTE: The nasotracheal route consists of the nose, pharynx, and trachea. This suctioning procedure is similar to nasopharyngeal suctioning, although deeper suctioning is accomplished.

(1) Estimate the distance the catheter is to be inserted by measuring from the tip of the earlobe to the nose and then to the larynx.

(2) Lubricate the catheter tip by dipping it into the saline solution.

(3) If the patient is alert and cooperative, instruct the patient to flex the neck and stick out the tongue. This makes insertion easier and prevents swallowing.

(4) Insert the catheter into one nostril. If an obstruction is met, try the other nostril. If both are obstructed, seek assistance.

(5) Quickly and gently advance the catheter into the trachea.

(6) Perform steps 9a(2) through 9a(7) to suction secretions.

CAUTION

If suctioning causes the patient to cough, remove the catheter until the coughing stops and then proceed.

10. Observe the patient for hypoxemia.

WARNING

Discontinue suctioning immediately if severe changes in color or pulse rate occur.

11. Disconnect the catheter and remove the gloves.
    a. Hold the catheter in one hand.
    b. Remove that glove by turning it inside out over the catheter to prevent the spread of contaminants.
    c. Remove the other glove.
    d. Discard them in contaminated trash.
12. Make the patient comfortable.
13. Discard or clean and store used items.
14. Record the procedure on the appropriate form.
    a. Respirations (rate and breath sounds before and after suctioning).
    b. Procedure (oral, nasopharyngeal, or nasotracheal).
    c. Type and amount of secretions.
    d. Patient's toleration of the procedure.

Evaluation Guide

Performance Measures	**Results**	
1. Position the patient.	P	F
2. Check the pressure on the suctioning apparatus.	P	F
3. Prepare the sterile materials.	P	F
4. Oxygenate the patient, if necessary.	P	F
5. Put on sterile gloves.	P	F
6. Remove the catheter from the package.	P	F
7. Attach the suction connecting tube to the catheter.	P	F
8. Test the patency of the catheter.	P	F
9. Suction the patient.	P	F

Performance Measures	Results	
10. Observe the patient for hypoxemia.	P	F
11. Disconnect the catheter and remove the gloves.	P	F
12. Make the patient comfortable.	P	F
13. Discard or clean and store used items.	P	F
14. Record the procedure on the appropriate form.	P	F
15. Do not violate aseptic technique.	P	F
16. Do not cause further injury to the patient.	P	F

REFERENCES: None

081-835-3023

PERFORM TRACHEOSTOMY SUCTIONING

CONDITIONS

You have identified the patient and explained the procedure. A patient care handwash has been performed. An assistant is available. Necessary materials and equipment: sterile gloves, masks, protective eyewear, a portable continuous suction machine or in-wall suction, disposable suction kit, a 5 cc syringe, gauze squares, sterile normal saline, an oxygen source with flowmeter, a manual resuscitator (ambu bag), connecting tubing, suction catheters, and the patient's clinical record.

STANDARDS

Perform tracheostomy suctioning without contamination and without causing further injury to the patient.

TRAINING/EVALUATION

Training Information Outline

1. Position the patient.

   a. Elevate the bed to a working height.

   b. Place the patient in a semi-Fowler's position.

NOTE: Perform suctioning as often as necessary to keep the airway free of secretions. Auscultate the patient's lungs and assess the breath sounds before beginning the suctioning procedure.

2. Check the pressure on the suction apparatus.

   a. Turn the unit on and place your thumb over the end of the connecting tubing.

   b. Ensure that the pressure reading on the suction apparatus is within the limits specified by local SOP and the recommendations of the equipment manufacturer.

   c. Notify your supervisor if the pressure is not within the recommended limits.

   d. Turn the suction unit off.

3. Prepare the sterile supplies and equipment.

   a. Open the sterile suction kit and use the inner wrapper to create a sterile field.

   b. Open the sterile normal saline container and pour the solution into the sterile container from the suction kit.

c. Open the suction catheter package just enough to expose the suction port.

CAUTION

To avoid causing hypoxia during suctioning, ensure that the diameter of the suction catheter is no greater than 1/2 the diameter of the tracheostomy tube.

4. Put on a mask and protective eyewear.

5. Put on sterile gloves.

6. Check the suction catheter for patency.

a. Pick up the suction catheter package with your nondominant hand.

CAUTION

The glove on your dominant hand must remain sterile. The other glove, on your nondominant hand, is for your protection and not considered sterile.

b. Pull the catheter from the package with the sterile hand, keeping the catheter coiled in your hand to maintain sterility.

c. Grasp the connecting tubing with your nonsterile hand and connect it to the catheter.

d. Turn on the suction apparatus with the nonsterile hand.

e. Insert the catheter tip into the sterile saline solution and apply suction. (Sterile solution should be suctioned into the drainage container.)

7. Instruct your assistant to oxygenate the patient.

a. Oxygenate the patient by increasing the oxygen concentration to 100% for 1 minute.

b. If the patient is receiving mechanical ventilation, disconnect the ventilator tubing and give the patient three to five breaths of 100% oxygen with a manual resuscitator.

CAUTION

Patients with copious secretions should not be oxygenated with a manual resuscitator, because this could cause the secretions to be forced deeper into the airway.

8. Insert the catheter into the tracheostomy tube.

a. Lubricate the tip of the catheter with sterile saline.

b. Insert the catheter, without suction, into the tracheostomy tube until slight resistance is felt.

9. Apply suction.

a. Place the thumb of your nonsterile hand over the suction control port on the catheter.

b. Apply intermittent suction by moving your thumb up and down over the suction control port.

c. Slowly and gently rotate the catheter between the thumb and index finger of your sterile hand as you withdraw the catheter from the tracheostomy tube.

CAUTION

Suctioning removes oxygen as well as secretions. Suction for no longer than 10 to 15 seconds at a time. Oxygenate the patient prior to the start of the procedure, between suctionings, and at the end of the procedure.

10. Instruct your assistant to oxygenate the patient while you rinse the suction catheter by suctioning a small amount of sterile saline through the catheter.

11. Repeat the suctioning procedure until the airway is clear.

NOTE: During suctioning, turn the patient's head to the left to facilitate suctioning of the right tracheobronchial tree, and to the right to facilitate suctioning of the left tracheobronchial tree.

a. Oxygenate the patient between suctionings and after the last suctioning.

b. Rinse the catheter between suctionings and after the last suctioning.

NOTE: If the secretions are tenacious, instill 3 cc to 5 cc of sterile normal saline (as directed by physician's orders) into the tracheostomy tube. This will liquify the secretions and facilitate their removal as you continue to suction.

12. Reconnect the patient to the original oxygen source or ventilator, if required.

13. Using the same setup and catheter, suction the patient's mouth and pharynx.

a. Ask the patient to stick out his or her tongue to facilitate passage of the catheter into the pharynx.

b. Advance the catheter deep enough to remove the secretions that have pooled on top of the tracheostomy cuff.

CAUTION

Once a catheter has been used for oropharyngeal suctioning, it is considered contaminated. Do not reinsert it into the patient's tracheostomy.

c. Discard the suction catheter and flush the connecting tubing of all secretions by suctioning some of the sterile saline through the tubing.

d. Turn off the suction apparatus.

14. Auscultate the patient's lungs and assess breath sounds.

15. Provide mouth care.

a. Assist the patient in brushing his or her teeth and rinsing with mouthwash.

b. If the patient is unable to perform mouth care, wrap a moistened gauze square around your index finger and wipe all tooth surfaces. Wipe the gums with lemon-glycerine swabs.

16. Position the patient for comfort and safety.

a. Lock the bed rails in the up position.

b. Lower the bedframe to its lowest position.

c. Secure the call bell to the bed within the patient's reach.

17. Discard all disposable equipment and restock the bedside cabinet with new equipment.

18. Document the procedure and significant nursing observations on the appropriate forms IAW local SOP.

a. Note the amount and character of secretions.

b. Describe the patient's tolerance of the procedure.

Evaluation Guide

Performance Measures	Results	
1. Position the patient.	P	F
2. Check the suction apparatus.	P	F
3. Prepare the sterile equipment.	P	F
4. Put on mask and protective eyewear.	P	F
5. Put on sterile gloves.	P	F
6. Check the catheter.	P	F
7. Oxygenate the patient.	P	F
8. Insert the catheter.	P	F
9. Apply suction.	P	F
10. Oxygenate the patient.	P	F
11. Repeat tracheostomy suctioning until the airway is clear.	P	F
12. Reconnect the patient to the original oxygen source or ventilator.	P	F
13. Suction the oropharynx.	P	F
14. Auscultate the patient's lungs.	P	F
15. Provide mouth care.	P	F
16. Position the patient for comfort and safety.	P	F
17. Discard used equipment and restock the bedside cabinet.	P	F
18. Document the procedure.	P	F

REFERENCES: None

081-835-3024

PROVIDE TRACHEOSTOMY CARE

CONDITIONS

You have an adult patient requiring tracheostomy care. You have explained the procedure to the patient, and a patient care handwash has been performed. An assistant is available. Necessary materials and equipment: tracheostomy cleaning kit, sterile and nonsterile gloves, masks, protective eyewear, suctioning equipment, neck tapes, sterile gauze, sterile normal saline, sterile water, hydrogen peroxide, and the patient's clinical record.

STANDARDS

Provide tracheostomy care without contamination and without causing further injury to the patient.

TRAINING/EVALUATION

Training Information Outline

1. Position the patient.
   a. Elevate the bed to a working height.
   b. Place the patient in a semi-Fowler's position.
2. Suction the patient's tracheostomy and oropharynx. (See task 081-835-3023.)

CAUTION

Always perform suctioning immediately prior to tracheostomy care.

3. Prepare the sterile materials for tracheostomy care.
   a. Open the tracheostomy cleaning kit or tray and use the inner wrapper to set up a sterile field.
   b. Open sterile dressings and other supplies and place them on the sterile field.
   c. Pour hydrogen peroxide into one basin and sterile saline into another.
4. Put on a mask and protective eyewear.
5. Remove the soiled tracheostomy dressing.
   a. Put on nonsterile gloves.

b. Carefully remove the soiled dressing, observing it for type and amount of drainage, if any.

c. Discard the contaminated dressing.

d. Remove and discard the nonsterile gloves.

e. Observe the condition of the tracheostomy site.

6. Clean the tracheostomy site.

a. Put on sterile gloves.

b. Using sterile swabs that have been moistened with saline solution, carefully clean around the tracheostomy site.

NOTE: If encrustations are present around the stoma site, it may be necessary to remove them with sterile swabs that have been moistened with hydrogen peroxide. Rinse the area with saline soaked swabs after the encrustations have been removed. Take care to let none of the solution enter the tracheostomy.

c. Pat the area dry with sterile gauze.

7. Remove the inner cannula.

a. Put on fresh sterile gloves if gloves were contaminated in the previous step.

b. Unlock the inner cannula.

c. Gently and carefully pull out the inner cannula.

NOTE: Not all tracheostomy tubes have an inner cannula.

8. Clean the inner cannula.

a. Immerse the inner cannula in hydrogen peroxide.

b. Clean the inner cannula with the sterile brush from the tracheostomy cleaning kit.

c. Ensure the removal of all secretions and encrustations from both inside and outside the inner cannula.

d. Rinse the inner cannula thoroughly with sterile saline.

NOTE: If an assistant is available, instruct him or her to suction the outer cannula to remove accumulated secretions.

9. Reinsert the inner cannula.

    a. Insert the inner cannula into the outer cannula.

    b. Lock the inner cannula into place.

10. Replace soiled neck tapes.

    a. Ask your assistant to hold the outer cannula securely in position while you change the tapes.

NOTE: If an assistant is not available to hold the outer cannula, apply the new neck ties prior to cutting and removing the old neck ties. This will prevent accidental dislodgement of the tracheostomy tube.

    b. Remove and discard the neck tapes.

    c. Secure the new tapes to the flanges of the outer cannula and tie the knot at the side of the neck.

NOTE: The neck tapes should not be tied so tightly that they cause discomfort to the patient. You should be able to slip one or two fingers under the neck tapes.

11. Apply a sterile dressing.

    a. Apply the prepared sterile dressing from the kit or sterile gauze folded in a V-shape.

    b. Position the dressing under the flanges of the outer cannula.

NOTE: The gauze dressing is placed under the tube to absorb secretions. This piece of gauze should be changed as often as necessary.

12. Provide mouth care.

    a. Assist the patient in brushing his or her teeth and rinsing with mouthwash.

    b. If the patient is unable to perform mouth care, wrap a moistened gauze square around your index finger and wipe all tooth surfaces. Wipe the gums with lemon-glycerine swabs.

13. Position the patient for comfort and safety.

    a. Lock the bed rails in the up position.

    b. Lower the bedframe to its lowest position.

    c. Secure the call bell to the bed within the patient's reach.

CAUTION

The call bell must be within reach at all times, as the patient cannot speak or call out for help.

14. Discard disposable equipment and restock the patient's bedside cabinet.

15. Document the care provided and significant nursing observations on the appropriate forms IAW local SOP.

a. Note the type and amount of drainage on the dressing, if any.

b. Describe the appearance of the tracheostomy site.

c. Note the type and amount of secretions suctioned.

d. Describe the patient's tolerance of the procedure.

Evaluation Guide

Performance Measures	**Results**	
1. Position the patient.	P	F
2. Suction the patient.	P	F
3. Prepare the sterile equipment.	P	F
4. Put on mask and protective eyewear.	P	F
5. Remove the soiled dressing.	P	F
6. Clean the tracheostomy site.	P	F
7. Remove the inner cannula.	P	F
8. Clean the inner cannula.	P	F
9. Reinsert the inner cannula.	P	F
10. Replace soiled neck tapes.	P	F
11. Apply a sterile dressing.	P	F
12. Provide mouth care.	P	F

Performance Measures	Results	
13. Position the patient for comfort and safety.	P	F
14. Discard disposable equipment and restock the bedside cabinet.	P	F
15. Document the care provided.	P	F

REFERENCES: None

081-830-3015

PREPARE INTUBATION EQUIPMENT

CONDITIONS

Necessary materials and equipment: laryngoscope, one spare light bulb, two charged D-cell batteries, laryngoscope blade with a light bulb inserted, assorted sizes of oral endotracheal (ET) tubes, 10 cc syringe, and a stylet.

STANDARDS

Perform all the steps necessary to prepare intubation equipment.

TRAINING/EVALUATION

Training Information Outline

1. Attach the laryngoscope blade to the laryngoscope.

   a. Hook the blade to the connector on the top of the laryngoscope. (See Figure 3-11.)

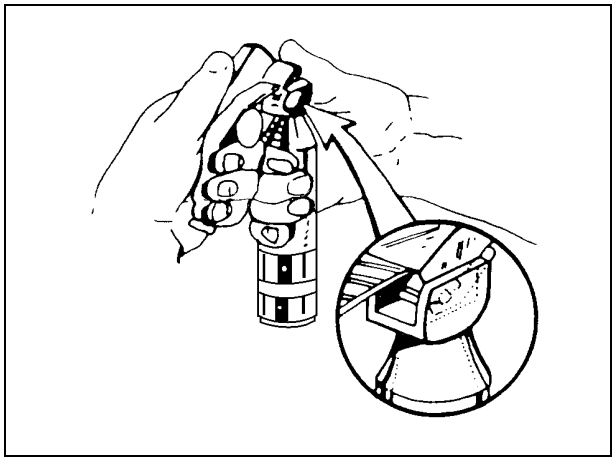


Figure 3-11

b. Lift the blade at a 90° angle to the laryngoscope to lock the blade in place. (See Figure 3-12.)

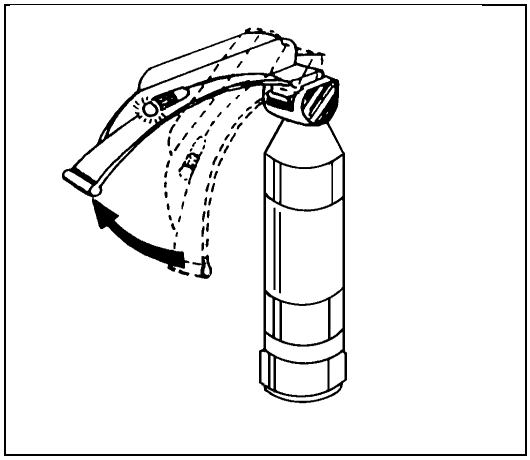


Figure 3-12

(1) If the light comes on, the laryngoscope is ready for use.

(2) If the light does not come on, replace the batteries and/or light bulb and retest.

(3) If the light does not work after replacing the batteries and light bulb, obtain another laryngoscope and blade and repeat the procedure.

2. Select the correct ET tube size.

   a. The average adult male will need a 7.5 or 8 millimeter diameter tube.

   b. The average adult female will need a 7 or 7.5 millimeter diameter tube.

3. Fill the 10 cc syringe with air.

   a. Hold the syringe in one hand.

   b. Push the plunger forward as far as it will go with the other hand.

   c. Pull the plunger back to the 10 cc mark.

4. Attach the syringe to the ET tube.

   a. Hold the ET tube cuff valve with one hand.

   b. With the other hand attach the syringe into the cuff valve on the ET tube.

5. Inflate the ET tube cuff with 10 cc of air by depressing the syringe plunger. (See Figure 3-13.)

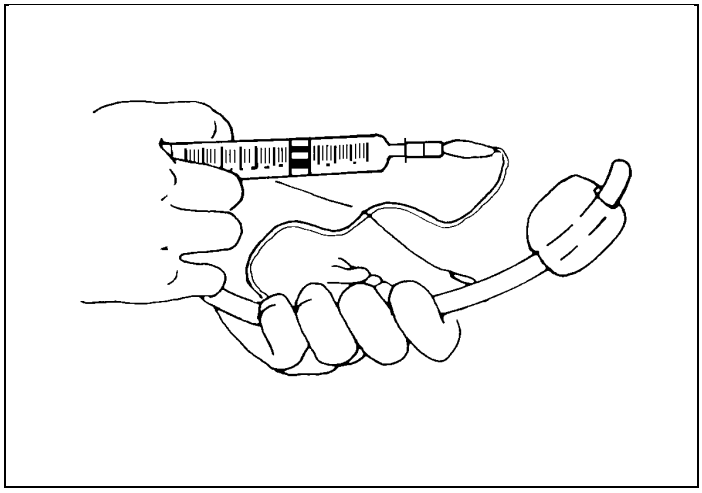


Figure 3-13

NOTE: Inflatable cuffs are used to attain an airtight seal, preventing aspiration. If the cuff leaks, another ET tube must be obtained, and the procedure must be repeated.

6. Deflate the cuff on the ET tube by pulling the syringe plunger back until the plunger reaches the 10 cc mark on the syringe.

7. Insert the stylet into the ET tube.

NOTE: The stylet gives added rigidity to the tube and facilitates maintenance of tube curvature.

a. Insert the stylet into the ET tube so the tip of the stylet is recessed 1/2 inch from the tip of the ET tube.

b. Bend the other end of the stylet at a 90° angle so that it can go no further into the ET tube.

CAUTION

If the stylet is not bent, the tip could advance past the end of the tube and puncture or lacerate the airway.

Evaluation Guide

Performance Measures	Results	
1. Attach the laryngoscope blade to the laryngoscope.	P	F
2. Select the correct ET tube size.	P	F
3. Fill the 10 cc syringe with air.	P	F
4. Attach the syringe to the ET tube.	P	F
5. Inflate the ET tube cuff.	P	F
6. Deflate the ET tube cuff.	P	F
7. Insert the stylet into the ET tube.	P	F

REFERENCES: None

081-830-3016

INTUBATE A PATIENT

CONDITIONS

You have an unconscious, nonbreathing casualty with no gag reflex. A qualified assistant is performing CPR. Suction equipment is available and ready for use. A laryngoscope and endotracheal (ET) tube have been prepared. You are not in an NBC environment. Necessary materials and equipment: bag-valve-mask (BVM) resuscitator or oxygen with demand valve, gloves, oral bite block or J tube, suction equipment, adhesive tape, benzoin, stethoscope, pressure manometer, and a 10 cc syringe.

STANDARDS

Complete all the steps necessary to establish an endotracheal tube airway in sequence and without causing further injury to the patient.

TRAINING/EVALUATION

Training Information Outline

CAUTION

Wear gloves to protect yourself against the transmission of contaminants whenever handling body fluids.

1. Put on gloves.
2. Oxygenate the patient with the bag-valve-mask for one minute.

CAUTION

Do not deprive the patient of oxygen for longer than 20 seconds at any time during the procedure.

3. Position the patient's head by hyperextending the neck.
4. Open the patient's mouth and hold it open.

5. Insert the laryngoscope blade. (See Figure 3-14.)

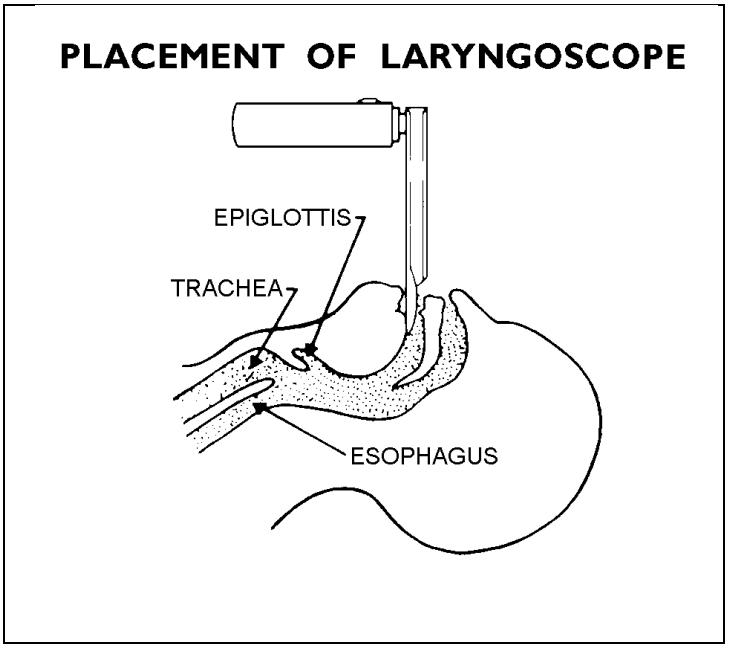


Figure 3-14

a. Stand or kneel at the top of the patient's head.

b. Hold the laryngoscope with your left hand.

c. Open and lock the blade at a 90° angle to turn the light on.

d. Place the blade into the right side of the patient's mouth.

e. Move the laryngoscope to the center of the patient's mouth by moving the patient's tongue to the left side of his or her mouth with the laryngoscope blade.

f. Advance the blade a short distance to observe the epiglottis. (See Figure 3-15.)

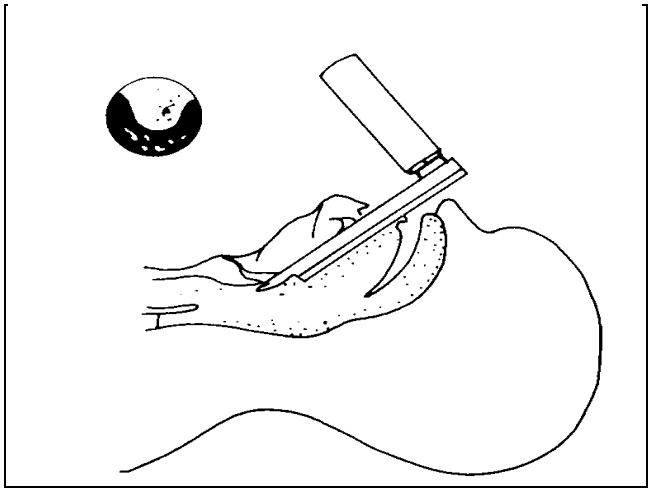


Figure 3-15

6. Retract the epiglottis and inspect the vocal cords. (See Figure 3-16.)

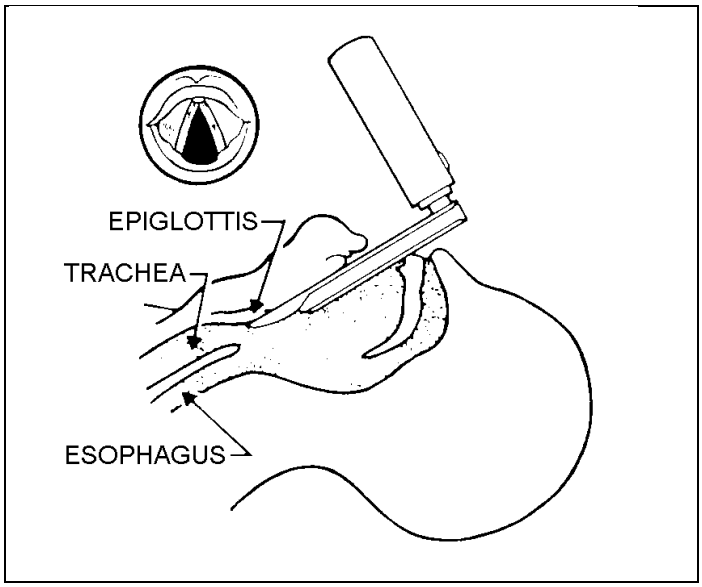


Figure 3-16

a. When using a curved laryngoscope blade (McIntosh), apply anterior pressure to the vallecula with the tip of the laryngoscope blade to fold back the epiglottis and expose the vocal cords. (See Figure 3-17.)

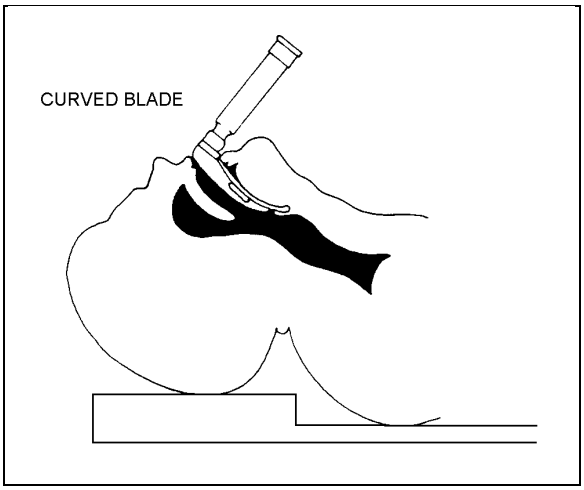


Figure 3-17

b. When using a straight laryngoscope blade (Miller), hook the blade tip under the epiglottis and pull up to fold back the epiglottis and expose the vocal cords. (See Figure 3-18.)

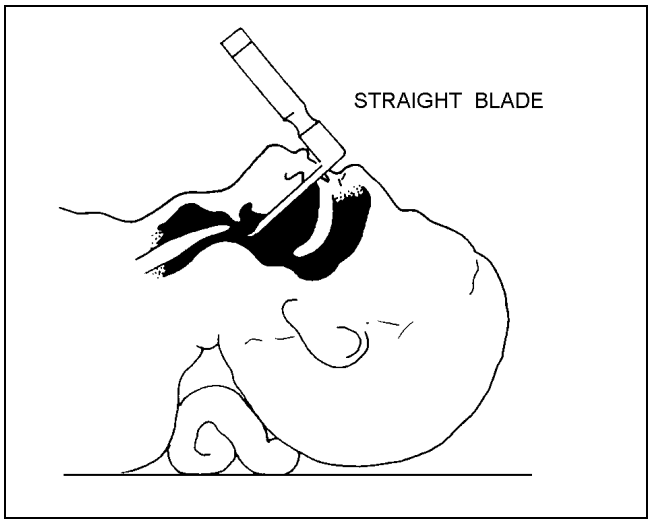


Figure 3-18

WARNING

Exert upward traction on the handle to expose the glottic opening. Never use the handle with a prying motion. Do not use the patient's teeth as a fulcrum.

7. Insert the ET tube into the trachea.

    a. Grasp the ET tube with your right hand.

    b. Insert the ET tube and carefully guide the tip of the tube between the vocal cords until the cuff is just below the level of the vocal cords. (See Figure 3-19.)

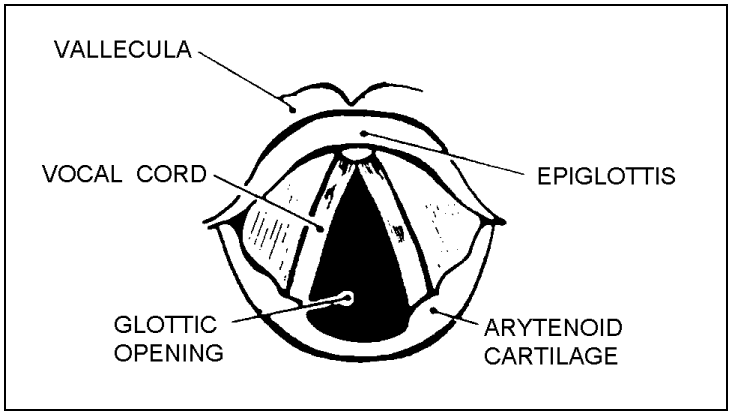


Figure 3-19

8. Remove the laryngoscope.

9. Remove the stylet from the ET tube.

    a. Hold the ET tube securely with your right hand.

    b. Pull the stylet straight out with your left hand.

10. Inject the required amount of air to inflate the cuff (5 to 10 cc) by pressing the plunger of the syringe. (See Figure 3-20.)

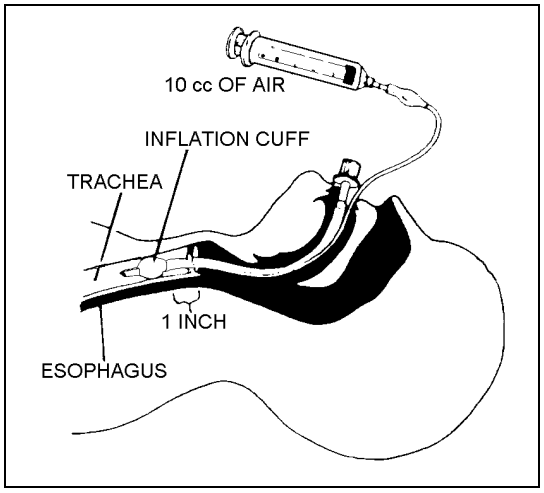


Figure 3-20

11. Check placement of the ET tube.

a. Place the resuscitative equipment over the end of the ET tube and blow air into the tube to inflate the lungs.

b. Instruct an assistant to auscultate the patient's lung fields and epigastric area while you manually ventilate the patient through the ET tube.

(1) If the patient's chest rises and bilateral breath sounds are heard without any abnormal sounds heard over the epigastric area, proceed to step 12.

(2) If sound is heard over only one lung field, then you must partially deflate the cuff, withdraw the tube a little, reinflate the cuff, and listen again.

NOTE: A misplaced ET tube is most likely to be in the right main stem bronchus.

(3) If a rushing sound is heard over the epigastric area, withdraw the tube completely, reoxygenate the patient, and wait at least three minutes before repeating the procedure.

12. Check cuff pressure.

a. Use a pressure manometer.

(1) Connect a pressure manometer to the pilot balloon to ensure the cuff pressure is less than 25 cm H_2O. Either inflate or deflate the pilot balloon to achieve the desired pressure.

(2) Remove the pressure manometer from the pilot balloon.

b. Use the minimal leak technique.

(1) Suction the patient thoroughly first.

(2) Attach and partially deflate the cuff using a 10 cc syringe.

(3) During the positive pressure ventilation, add air until only a slight leak is heard around the cuff during peak inspiration.

NOTE: Due to possible prolonged intubation, it is recommended that you use a tube with a high-volume/low pressure cuff to prevent possible necrosis at the cuff site. Using cuff pressures above 30 cm H_2O may produce a decrease in capillary mucosal blood flow resulting in ischemia.

(4) Hold the cuff valve in one hand and simultaneously twist and pull the syringe with your other hand to remove the syringe.

13. Reoxygenate the patient.

14. Wedge a bite block or J tube between the back teeth to prevent biting of the ET tube which may cause partial or complete obstruction of the tube. (See Figure 3-21.)

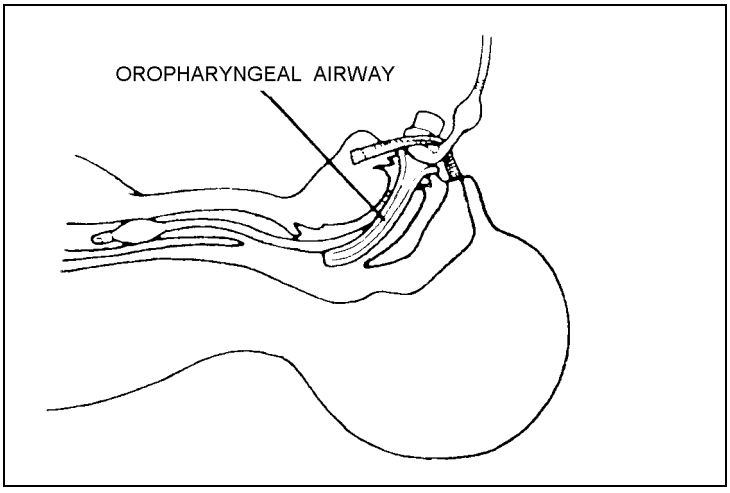


Figure 3-21

15. Secure the ET tube.

a. Wrap the middle of a long piece of tape around the ET tube.

b. Attach each end of the tape to the patient's face.

NOTE: Benzoin may be applied to the skin to prevent the tape from coming off.

16. Ventilate the patient once every five seconds.

17. Monitor the patient and ensure correct tube placement is maintained by auscultating the lungs and epigastric area.

NOTE: The tip of the tube should be 2 to 3 centimeters above the carina. Proper tube placement is confirmed by taking an x-ray of the patient's chest.

18. Record the procedure.

Evaluation Guide

Performance Measures	**Results**	
1. Put on sterile gloves.	P	F
2. Oxygenate the patient.	P	F
3. Position the patient's head.	P	F
4. Open the patient's mouth.	P	F
5. Insert the laryngoscope blade.	P	F
6. Retract the epiglottis and inspect the vocal cords.	P	F
7. Insert the ET tube into the trachea.	P	F
8. Remove the laryngoscope.	P	F
9. Remove the stylet from the ET tube.	P	F
10. Inflate the cuff.	P	F
11. Check the placement of the ET tube.	P	F
12. Check the cuff pressure.	P	F
13. Reoxygenate the patient.	P	F
14. Wedge a bite block or a J tube between the back teeth.	P	F
15. Secure the ET tube.	P	F

Performance Measures	Results
16. Ventilate the patient once every five seconds.	P F
17. Monitor the patient.	P F
18. Record the procedure.	P F
19. Complete all necessary steps in order.	P F

REFERENCES: None

081-830-3014

EXTUBATE A PATIENT

CONDITIONS

A patient is in the supine position with an endotracheal (ET) tube inserted through the mouth. You have performed a patient care handwash and have obtained the physician's order to remove the ET tube. Necessary materials and equipment: suctioning apparatus, emesis basin, 10 cc syringe, gloves, bag-valve-mask (BVM) resuscitator or oxygen with demand valve, and cardiac monitor.

STANDARDS

Complete all the steps necessary to remove the endotracheal tube without causing further injury to the patient. Removal of the tube (step 13) must take no longer than 20 seconds. Complete steps 1 through 14 in order.

TRAINING/EVALUATION

Training Information Outline

CAUTIONS

1. The patient's airway must be monitored throughout this procedure to prevent the patient from gagging on aspirated vomitus.
2. Oropharyngeal suctioning may be required at any time during this procedure if the patient vomits.

1. Read and verify the order on the consultation form.
2. Identify the patient by his or her arm band.
3. Explain the procedure to the patient.
4. Put on sterile gloves.
5. Monitor the patient's cardiac status.
6. Preoxygenate the patient for at least one minute.
7. Advance the suction catheter as far as possible with the suction off.
8. Apply intermittent suctioning while slowly withdrawing the catheter in a rotating fashion.

CAUTION

Do not apply suction for more than 10 to 15 seconds at one time.

NOTE: The mouth, pharynx, and the top of the endotracheal tube cuff should also be suctioned at this time. This will prevent any secretions that have pooled over the top of the cuff or in the mouth from going down the trachea once the cuff is deflated.

9. Reoxygenate the patient with two slow breaths.

10. Untape the ET tube from the patient's face while holding the ET tube in place.

NOTE: It is more comfortable for the patient if the tape is rolled away from the skin.

11. Deflate the ET tube cuff by attaching a 10 cc syringe to the cuff valve and pulling back on the plunger of the syringe as far as it will go.

CAUTION

If the cuff is only partially deflated while attempting to extubate the patient, the trauma could cause the patient's trachea to swell shut as well as cause permanent damage to the vocal cords.

12. Turn the patient's head to the side.

13. Remove the ET tube during exhalation.

a. Grasp the ET tube with the thumb and fingers of the dominant hand.

NOTE: If the patient vomits, hand the patient an emesis basin or place the basin under his or her chin to catch the vomitus. Have suction available, if needed.

b. Tell the patient to take a deep breath.

c. At the beginning of exhalation, pull the ET tube out without applying undue force, using a gradual continuous motion, until the tube is completely out of the patient's mouth.

NOTE: As a general guideline the removal of the ET tube from the trachea should take only 5 seconds, but it may take up to 20 seconds.

CAUTIONS

1. If this step takes any longer than 20 seconds, the patient could be deprived of oxygen.
2. Remove the tube during exhalation to ensure that the patient does not inhale secretions back into the lungs.

14. Have the patient cough in order to assist in maintaining the patient's airway.

15. Start the patient on gas therapy.

NOTE: Reassure the patient that a slight irritation is normal and to talk only after the irritation has gone.

16. Dispose of used supplies and store the equipment.

17. Remove gloves and wash hands.

18. Record the procedure on the consultation form.

Evaluation Preparation

Setup: For training and evaluation a mannequin must be used. Under no circumstances will this task be evaluated using another soldier as a simulated casualty. Prepare a written order for removal of an endotracheal tube.

Brief soldier: Tell the soldier to remove the ET tube.

Evaluation Guide

Performance Measures	**Results**	
1. Read and verify orders.	P	F
2. Identify the patient.	P	F
3. Explain the procedure to the patient.	P	F
4. Put on sterile gloves.	P	F
5. Monitor the patient's cardiac status.	P	F
6. Preoxygenate the patient for at least one minute.	P	F
7. Advance the suction catheter.	P	F

Performance Measures	Results	
8. Apply intermittent suction.	P	F
9. Reoxygenate the patient.	P	F
10. Untape the ET tube.	P	F
11. Deflate the ET tube cuff.	P	F
12. Turn the patient's head to the side.	P	F
13. Remove the ET tube during exhalation taking no longer than 20 seconds.	P	F
14. Have the patient cough to maintain the airway.	P	F
15. Complete steps 1 through 14 in order.	P	F
16. Start gas therapy.	P	F
17. Dispose of used supplies and store equipment.	P	F
18. Remove gloves and wash hands.	P	F
19. Record the procedure.	P	F

REFERENCES: None

081-830-3000

PREPARE A MEDICAL GAS CYLINDER FOR PATIENT USE

CONDITIONS

A patient care handwash has been performed. Necessary materials and equipment: full gas cylinders, nonsparking cylinder wrench, cylinder regulators, flowmeters for E and M cylinders, yoke attachment, humidifier, sterile water, gas therapy device, and warning signs.

STANDARDS

Set up the gas cylinder without violating safety precautions or endangering patients or self.

TRAINING/EVALUATION

Training Information Outline

1. Obtain the necessary equipment.

   a. Gas cylinder. (See Figure 3-22.)

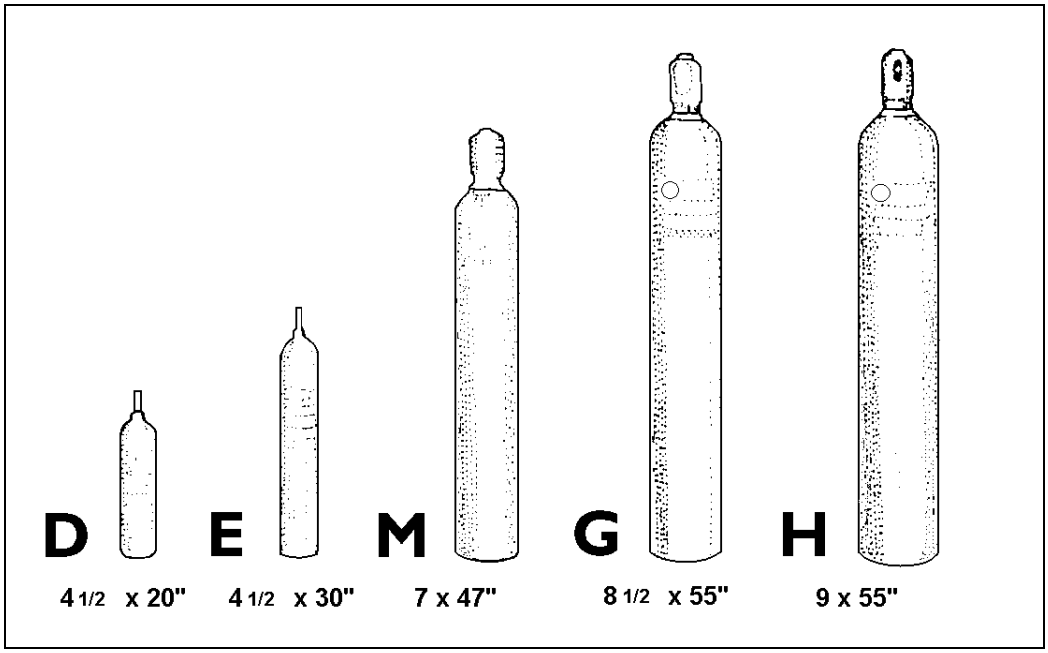


Figure 3-22

(1) Check the gas cylinder tag to determine whether the tank is "FULL", "IN USE" (partially full), or "EMPTY." (See Figure 3-23.)

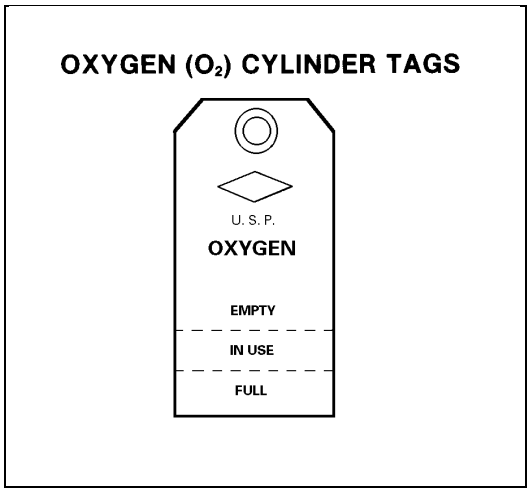


Figure 3-23

(2) Always ensure that the gas cylinder selected corresponds with the appropriate color code. (See Figure 3-24.)

Gas	Color
Oxygen	Green
Carbon dioxide	Gray
Nitrous oxide	Light blue
Cyclopropane	Orange
Helium	Brown
Ethylene	Red
Carbon dioxide and oxygen	Gray and green
Helium and oxygen	Brown and green
Air	Yellow (black, military use only)

Figure 3-24

(3) Verify the cylinder's contents by carefully reading its label.

b. Cylinder regulator with flowmeter. (See Figure 3-25.)

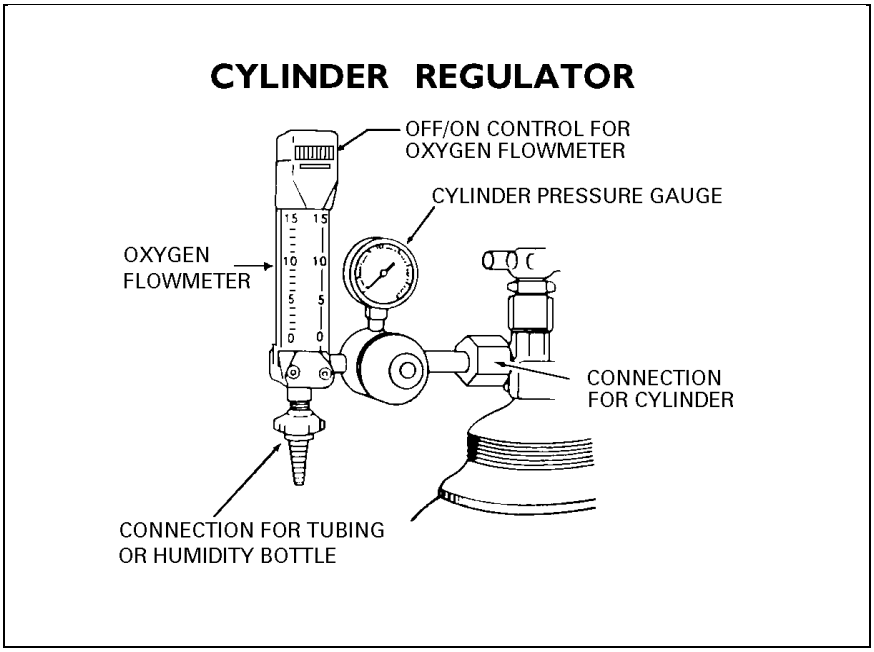


Figure 3-25

NOTE: The function of a regulator is to reduce a high pressure gas source to a low working pressure and maintain a constant working pressure as the flow rate is changed. The function of a flowmeter is to regulate or control the flow rate of a gas.

NOTE: When the cylinder regulator pressure gauge reads 200 psi, the gas cylinder is considered empty.

NOTE: The uncompensated Thorpe-tube flowmeter may give false low readings in the presence of back pressure and is affected by gravity and therefore must be kept in the vertical position. The compensated Thorpe-tube flowmeter is also affected by gravity but not affected by back pressure. The Bourdon gauge flowmeter is not affected by gravity; however, it may give false high readings in the presence of back pressure.

c. Humidifier.

d. Sterile water.

e. Nonsparking cylinder wrench.

f. Gas cylinder transport carrier and/or stand.

g. Gas delivery system ordered by the physician.

h. "OXYGEN IN USE" sign.

CAUTION

Because of the extreme pressure in gas cylinders, they should be handled with great care. Do not allow cylinders to be banged together, dropped, or knocked over.

2. Secure and position the gas cylinder.

   a. Place the tank in an upright position or IAW local SOP.

   b. Secure the tank with straps or place the tank in a stand.

   c. Keep the tank away from door openings and areas of high traffic.

3. Remove the cylinder valve cap.

NOTE: The cylinder valve cap may be noisy or difficult to remove. However, the threads of the cylinder cap should never be oiled.

4. Use either the handwheel or a nonsparking wrench to "crack" (slowly open and quickly close) the cylinder to flush out any debris.

CAUTION

The cylinder outlet valve must point away from you and anyone in the area.

5. Attach the regulator to the cylinder.

NOTE: The indexed connector systems used for medical gas cylinders are the Diameter Index Safety System (DISS) for M, G, and H cylinders and the Pin Index Safety System (PISS) for E and D cylinders.

   a. M, G, and H cylinders.

      (1) Hold the gauge in an upright position.

      (2) Insert the cylinder regulator inlet into the gas cylinder's threaded outlet in an upright position.

      (3) Hand-tighten the inlet nut, located on the cylinder regulator, and then completely tighten the inlet nut with a nonsparking wrench. (See Figures 3-26 and 3-27.)

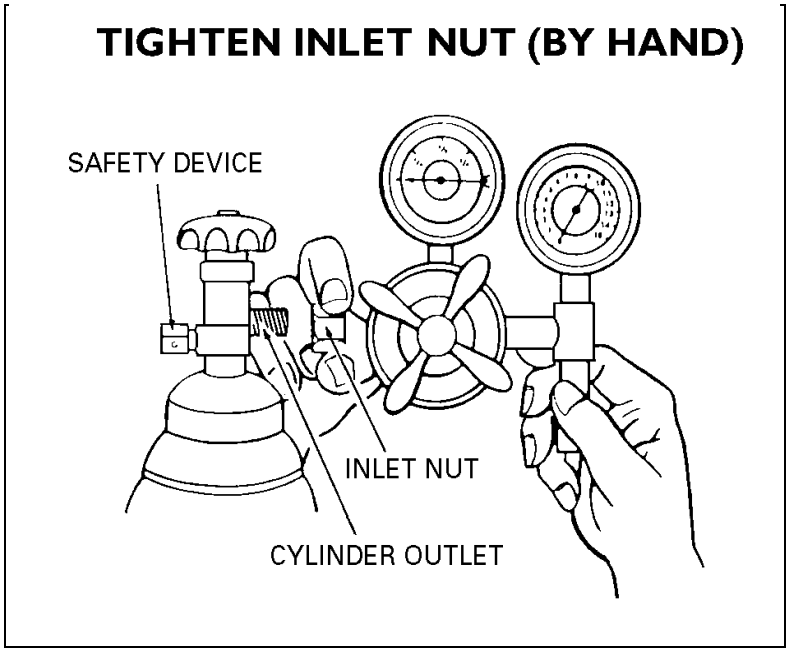


Figure 3-26

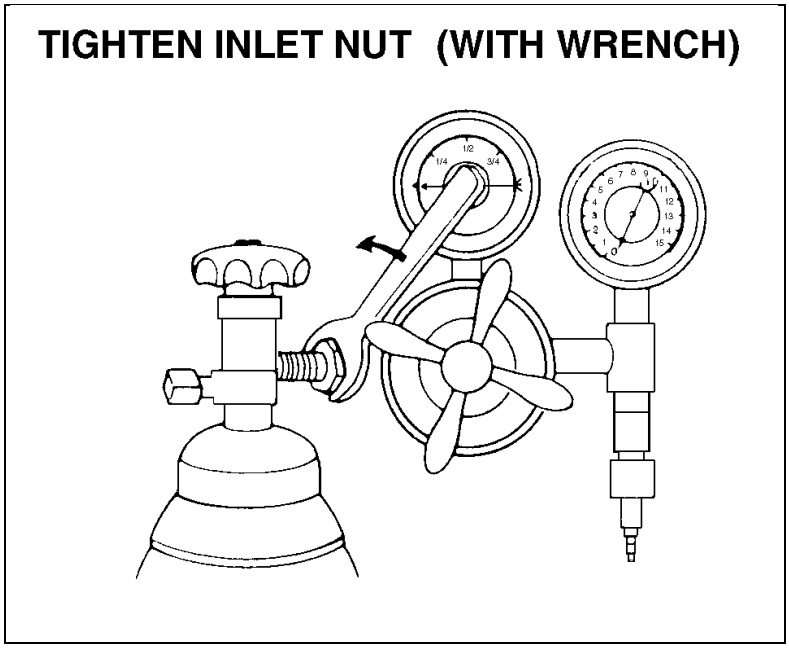


Figure 3-27

(4) Open the valve to test for leaks, and then close it.

N**OTE:** If there is a leak, check the regulator connection and obtain a new regulator and/or cylinder, if necessary.

b. D or E cylinders.

(1) Locate the three holes on the gas cylinder stem and ensure that an "O" ring is present. (See Figure 3-28.)

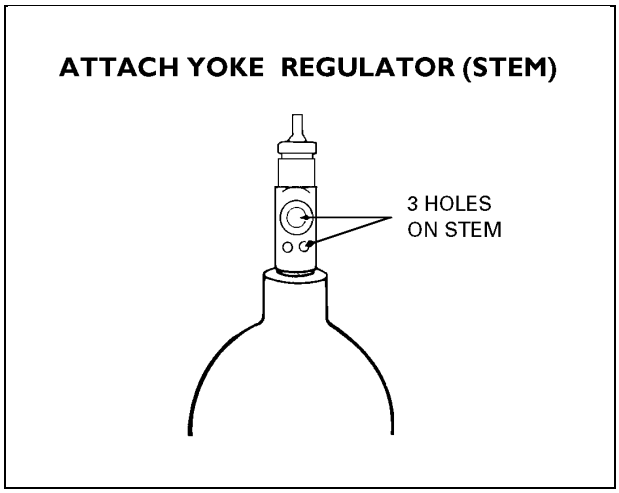


Figure 3-28

NOTE: If the "O" ring is not present, a gas leak will occur.

(2) Examine the yoke attachment and locate the three corresponding pegs on the yoke attachment. (See Figure 3-29.)

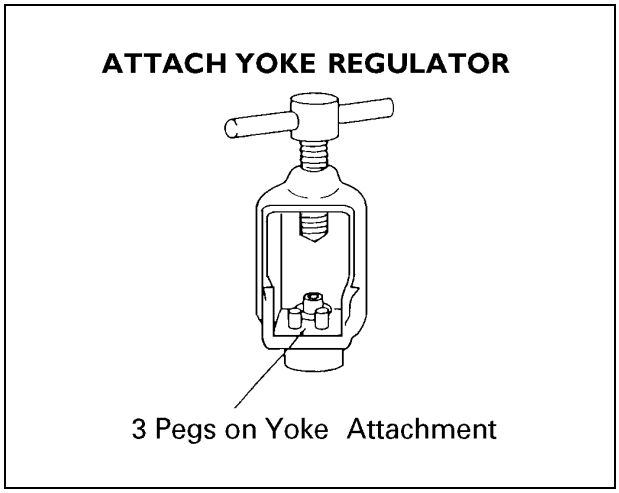
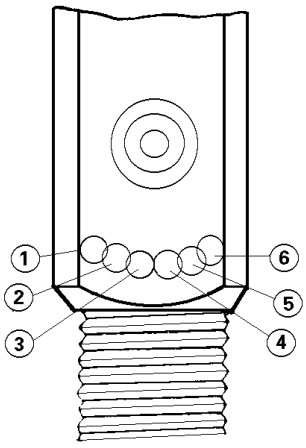


Figure 3-29

(3) Slide the yoke attachment over the cylinder stem and ensure that the pegs are seated in the proper holes. (See Figure 3-30.)



Gas	Index hole position
O_2	2-5
O_2/CO_2 (CO_2 not over 7%)	2-6
He/O_2 (He not over 80%)	2-4
C_2H_4	1-3
N_2O	3-5
$(CH_2)_3$	3-6
He/O_2 (He over 80%)	4-6
O_2/CO_2 (CO_2 over 7%)	1-6
Air	1-5

Figure 3-30

(4) Turn the vise-like screw on the side of the yoke attachment to secure it.

(5) Open the valve to test for leaks, and then close it.

NOTE: If there is a leak, check the regulator connection and obtain a new regulator and/or cylinder, if necessary.

6. Attach the appropriate gas therapy device.

7. Calculate the duration of flow of the gas cylinder.

   a. Determine the pressure in the cylinder by reading the regulator gauge.

   b. Determine the safe residual level of the gas cylinder.

NOTE: The safe residual level is the level of gas at which the cylinder should be replaced. This level has been established to be 200 pounds per square inch (psi).

c. Determine the available cylinder pressure by subtracting the safe residual level from the cylinder pressure. Example: 2000 psi in a cylinder. 2000 psi cylinder pressure minus 200 psi safe residual level = 1800 psi available pressure.

d. Determine the conversion factor for the gas cylinder in use.

NOTE: Each type of gas cylinder, depending on its size, employs a specific conversion factor.

(1) D size gas cylinder--0.16.

(2) E size gas cylinder--0.28.

(3) G size gas cylinder--2.41.

(4) H size gas cylinder--3.14.

(5) M size gas cylinder--1.56.

e. Determine the available liters by multiplying the conversion factor by the amount of available pressure. Example: A "D" size cylinder is being used. A .16 conversion factor x 1800 psi available pressure = 288 liters of gas available for use.

f. Obtain the flow rate as prescribed by the physician's order.

g. Determine the duration of the gas by dividing the available liters by the flow rate. Example: 288 available liters divided by the prescribed flow rate of 10 lpm = 28.8 (29) minutes duration of gas flow.

8. Document the completion of the procedure.

Evaluation Guide

Performance Measures	**Results**	
1. Obtain the necessary equipment.	P	F
2. Secure and position the gas cylinder.	P	F
3. Remove the cylinder valve cap.	P	F
4. "Crack" the cylinder to flush out any debris.	P	F
5. Attach the regulator to the cylinder.	P	F
6. Attach the appropriate gas therapy device.	P	F

Performance Measures	Results
7. Calculate the duration of flow of the gas cylinder.	P F
8. Document the completion of the procedure.	P F

REFERENCES: None

081-830-3001

ADMINISTER GAS THERAPY

CONDITIONS

All equipment is in place. You have performed a patient care handwash and have obtained the physician's order. Necessary materials and equipment: consultation form, humidifier, flowmeter, 50 psi gas source, sterile water, warning signs, nasal cannula, and masks (simple mask, partial rebreathing mask, nonrebreathing mask, Venturi mask).

STANDARDS

Administer gas therapy without causing further injury or unnecessary discomfort to the patient.

TRAINING/EVALUATION

Training Information Outline

1. Read and verify the order on the consultation form.
2. Identify the patient by asking his or her name and by checking his or her armband.
3. Explain the procedure to the patient and answer any questions about the therapy he or she may have.
4. Attach the flowmeter to the 50 psi gas source.
5. Fill the humidifier with sterile water.
6. Attach the humidifier to the flowmeter.
7. Test the humidifier.
    a. Turn on the gas flow.
    b. Occlude the gas port on the humidifier and listen for the safety valve to release.

NOTE: If the safety valve does not release, change the humidifier and repeat steps 5 through 7.

8. Select the appropriate high-flow or low-flow oxygen delivery device.

NOTE: A low-flow device is one in which the gas flow of the apparatus is insufficient to meet all inspiratory requirements. A high-flow device is one in which the gas flow of the apparatus is sufficient to meet all inspiratory requirements.

NOTE: A low-flow device such as a nasal cannula, simple mask, partial rebreathing mask, and nonrebreathing mask should not be used on patients who do not meet the following criteria: tidal volume between 300-700 ml, ventilatory rate below 25 bpm, and a ventilatory pattern that is regular and consistent.

9. Attach the breathing device to the humidifier gas port.

a. Nasal cannula.

(1) Fractional inspired oxygen concentration (FIO_2) range--24% to 40%.

(2) Flowrate--1 to 6 lpm.

NOTE: Although seldom used, there is also a nasal catheter that may be used in some units. This device is used with a flowrate of 4 to 7 lpm and provides an FIO_2 range of 25% to 50%.

b. Simple oxygen mask.

(1) FIO_2 range--30% to 55%.

(2) Flowrate--6 to 10 lpm.

CAUTION

Never use this device with a flowrate less than 6 lpm because of possible CO_2 retention.

c. Partial rebreathing mask.

(1) FIO_2 range--50% to 70%.

(2) Flowrate--adjusted for each patient so the reservoir bag does not collapse by more than one third during peak inspiration.

d. Nonrebreathing mask.

(1) FIO_2 range--70% to 100%.

(2) Flowrate--same as for the partial rebreathing mask.

e. Venturi mask.

(1) FIO_2 range--precise FIO_2 increments can be delivered ranging from 24% to 50%.

(2) Flowrate--depends on the selected FIO_2.

NOTE: The FIO_2 variation occurs due to alterations in the entrainment port size or by variations in the size of the gas jet orifice.

CAUTION

Accidental aspiration of vomitus is a hazard with any oxygen mask.

10. Adjust the flowrate in accordance with the physician's order or the manufacturer's instructions, depending on the type of device used.

11. Position the required breathing device.

a. Nasal cannula.

(1) Insert the prongs into the patient's nostrils.

(2) While holding the prongs in the patient's nostrils, loop the tubing over and behind the patient's ears.

(3) Adjust the sliding adapter to obtain a comfortable fit under the patient's chin.

b. Mask.

(1) Place the mask over the patient's face.

(2) Adjust the mask to fit snugly over the facial contours to prevent leakage.

NOTE: Manufacturer's instructions are included in the mask package.

12. Place an "OXYGEN IN USE" sign in the vicinity of the patient.

13. Record the treatment given on the consultation form.

a. Flowrate.

b. Time of therapy.

c. Mode of therapy.

d. Patient's response to the therapy.

e. Oxygen percentage.

NOTE: Humidifier and gas therapy devices should be changed at least once every 72 hours.

Evaluation Guide

Performance Measures	Results	
1. Read and verify the order.	P	F
2. Identify the patient.	P	F
3. Explain the procedure to the patient.	P	F
4. Attach the flowmeter to the 50 psi gas source.	P	F
5. Fill the humidifier.	P	F
6. Attach the humidifier to the flowmeter.	P	F
7. Test the humidifier.	P	F
8. Select the appropriate breathing device.	P	F
9. Attach the breathing device to the humidifier port.	P	F
10. Adjust the flowrate.	P	F
11. Position the required breathing device.	P	F
12. Place an "OXYGEN IN USE" sign in the vicinity of the patient.	P	F
13. Record the treatment.	P	F

REFERENCES: None

081-830-3002

ADMINISTER NEBULIZATION THERAPY

CONDITIONS

You have performed a patient care handwash and have obtained the physician's order. Necessary materials and equipment: consultation form, stethoscope, gas or power source, nebulizer device, small-bore tubing, mask or mouthpiece, medication, normal saline, and sterile water.

STANDARDS

Administer nebulization therapy without causing further injury or unnecessary discomfort to the patient.

TRAINING/EVALUATION

Training Information Outline

1. Read and verify the order on the consultation form.
2. Identify the patient by asking his or her name and by checking his or her armband.
3. Explain the procedure to the patient and answer any questions about the therapy.
4. Attach the therapy device to the gas or power source.
5. Add water, normal saline, or medication to the medicine cup or jar.
6. Position the patient in the upright position for maximal diaphragm and chest expansion and distribution of the medication.

NOTE: If the patient is unable to sit upright, raise his or her head and chest as high as possible.

7. Take the patient's vital signs before, during, and after the therapy.
8. Auscultate the patient's lungs. (See task 081-830-3005.)
9. Adjust the flow of gas so that a light cloud or mist appears.
10. Administer the therapy to the patient.
    a. Hold the mask over the patient's face or
    b. Tell the patient to place the mouthpiece between his or her lips.
    c. Instruct the patient on the proper breathing technique.

(1) Tell the patient to inspire slowly and deeply through his or her mouth.

NOTE: Inspiring through the mouth will improve distribution of ventilation and avoid having the aerosol being deposited in the nose.

(2) Have the patient hold his or her breath for a few seconds to maximize diffusion and deposition of the aerosol due to gravity.

(3) Tell the patient to exhale slowly.

NOTE: This slow exhalation allows additional time for aerosol deposition and may prevent air from trapping on exhalation.

CAUTION

If the patient's pulse rate increases or decreases more than 20 beats per minute, immediately stop the treatment and notify the physician.

11. Disconnect the patient from the therapy device upon completion of the therapy.

12. Shut off the gas or power source.

13. Record the treatment given on the consultation form.

    a. Breath sounds before, during, and after therapy.

    b. Pulse rate before, during, and after therapy.

    c. Respiratory rate before, during, and after therapy.

    d. How the patient tolerated the treatment.

    e. Sputum production.

14. Clean the equipment.

    a. Send a nondisposable unit to CMS.

    b. Place a disposable unit in a contaminated trash bag.

Evaluation Guide

Performance Measures	Results	
1. Read and verify orders.	P	F
2. Identify the patient.	P	F
3. Explain the procedure.	P	F
4. Attach therapy device to the gas or power source.	P	F
5. Add water, normal saline, or medication to the medicine cup or jar.	P	F
6. Position the patient.	P	F
7. Take the patient's vital signs.	P	F
8. Auscultate the patient's lungs.	P	F
9. Adjust the flow of gas.	P	F
10. Administer the therapy to the patient.	P	F
11. Disconnect the patient from the therapy device.	P	F
12. Shut off the gas or power source.	P	F
13. Record the treatment.	P	F
14. Clean the equipment.	P	F

REFERENCES: None

081-830-3017

ADMINISTER AEROSOL THERAPY

CONDITIONS

You have performed a patient care handwash and have obtained the physician's order. Necessary material and equipment: consultation form, corrugated tubing, aerosol device, flowmeter, gas source, sterile water, warning signs, Briggs adapter, trach collar, aerosol mask, and face tent.

STANDARDS

Administer aerosol therapy without causing further injury or unnecessary discomfort to the patient.

TRAINING/EVALUATION

Training Information Outline

1. Read and verify the order on the consultation form.
2. Identify the patient by asking his or her name and by checking his or her armband.
3. Explain the procedure to the patient and answer any questions about the therapy.
4. Fill the nebulizer with sterile water.
5. Attach the flowmeter to the gas source.
6. Attach the nebulizer to the flowmeter.
7. Attach the corrugated tubing to the nebulizer gas port.
8. Attach the appropriate breathing device to the corrugated tubing.
    a. Briggs adapter (T-tube).
    b. Trach collar.
    c. Aerosol mask.
    d. Face tent.
9. Turn on the gas flow and adjust the flowrate so that a stream of aerosol is seen at the end of peak inspiration.

CAUTION

Inadequate flowrate for any aerosol device will lead to room air entrainment which will decrease the fractional inspired oxygen concentration (FIO_2).

10. Adjust the FIO_2 IAW the physician's order.

NOTE: The nebulizer FIO_2 range can be set to precise increments ranging from 21% to 100%. A prescribed FIO_2 of 60% or greater may require an additional nebulizer to be set up and blended in line with the other nebulizer using a "Y" connector.

11. Position the required aerosol delivery device.

NOTE: Heating elements should be used for patients who are intubated or have tracheostomy tubes. The proximal airway temperature should be monitored and maintained at body temperature.

a. Briggs adapter (T-tube). (See Figure 3-31.)

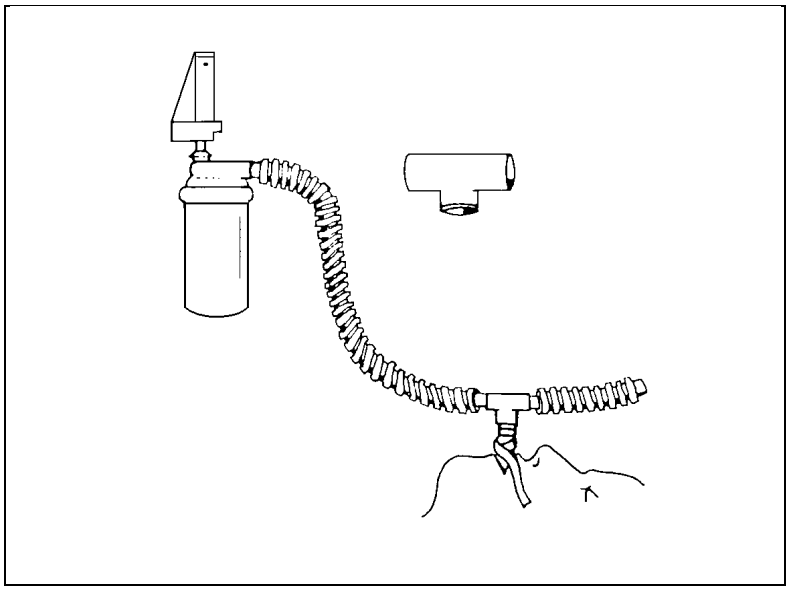


Figure 3-31

(1) Attach the T-tube to the endotracheal or tracheostomy tube.

(2) Position the aerosol tubing so that it does not pull on the patient's airway and does not cause aspiration or "rainout" which would cause the patient discomfort.

NOTE: If "rainout" occurs, unhook the tubing, stretch it out, and allow the moisture to drain out of the tubing.

CAUTIONS

1. If the patient is coherent, warn the patient that the tubing is short and that exaggerated movement could cause accidental extubation.
2. If the patient is not coherent, request the nursing staff to periodically check the patient to ensure that accidental extubation has not occurred.

(3) Periodically check the tubing to ensure secretions are removed to prevent aspiration.

b. Trach collar. (See Figure 3-32.)

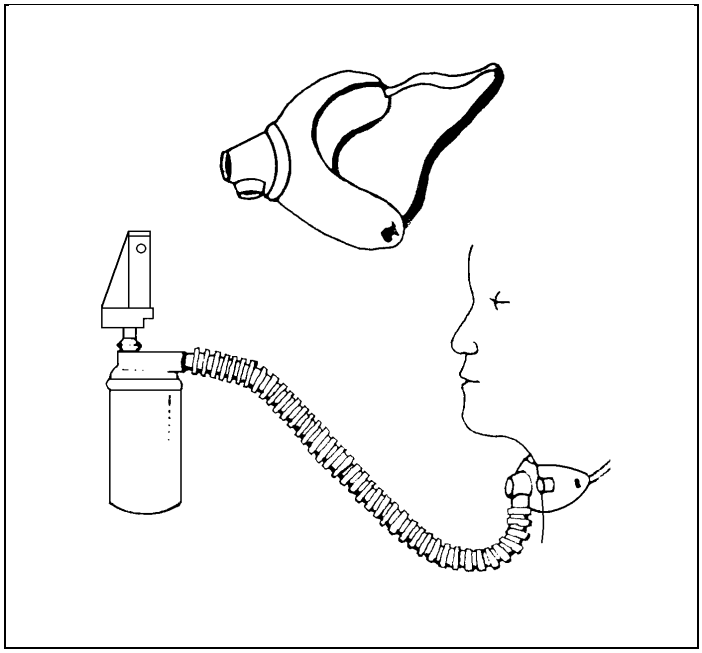


Figure 3-32

(1) Place the opening of the collar over the stoma.

(2) Adjust the collar to ensure a tight fit.

CAUTION

A loose fitting collar can move away from the stoma and block the trach tube.

c. Aerosol mask. (See Figure 3-33.)

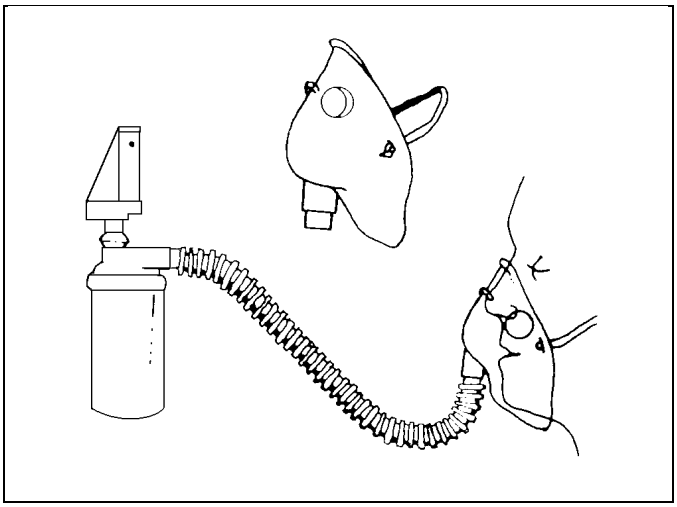


Figure 3-33

(1) Place the mask over the patient's nose and mouth.

(2) Adjust the mask to fit snugly over the facial contours to prevent leakage.

d. Face tent. (See Figure 3-34.)

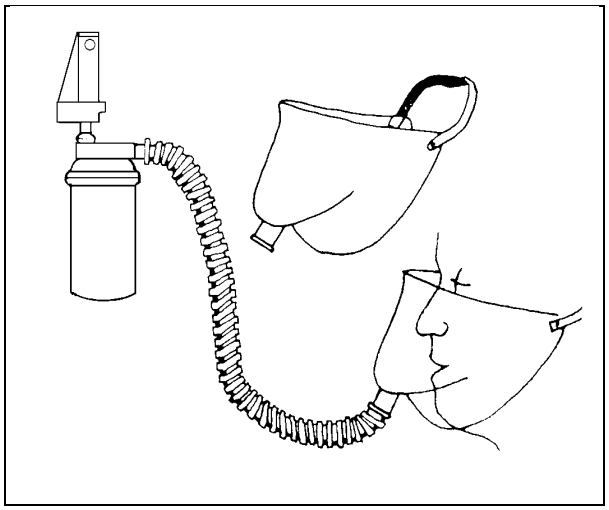


Figure 3-34

(1) Place the face tent over the patient's face and lower jaw.

(2) Adjust the face tent to fit snugly under the patient's chin.

NOTE: Ensure that no part of the face tent touches the patient's face except for under the chin.

NOTE: The face tent is commonly used on patients with facial burns or with oral and/or nasal trauma.

NOTE: Manufacturer's instructions are included in the mask package.

12. Place an "OXYGEN IN USE" sign in the vicinity of the patient.
13. Record the treatment given on the consultation form.
    a. Flowrate.
    b. Time of therapy.
    c. Mode of therapy.
    d. Patient's response to the therapy.
    e. Oxygen percentage.

NOTE: Nebulizer and aerosol therapy devices should be changed at least once every 24 hours.

Evaluation Guide

Performance Measures	**Results**	
1. Read and verify orders.	P	F
2. Identify the patient.	P	F
3. Explain the procedure.	P	F
4. Fill the nebulizer with sterile water.	P	F
5. Attach the flowmeter to the gas source.	P	F
6. Attach the nebulizer to the flowmeter.	P	F
7. Attach the corrugated tubing to the nebulizer gas port.	P	F
8. Attach the appropriate breathing device to the corrugated tubing.	P	F

Performance Measures	Results	
9. Turn on the gas flow.	P	F
10. Adjust the FIO_2 IAW the physician's order.	P	F
11. Position the required breathing device.	P	F
12. Place an "OXYGEN IN USE" sign in the vicinity of the patient.	P	F
13. Record the treatment.	P	F

REFERENCES: None

081-830-3006

PERFORM AN ARTERIAL PUNCTURE

CONDITIONS

You have performed a patient care handwash and have obtained the physician's order. Necessary materials and equipment: syringe and needle and sodium heparin (1:1000) or a preheparinized syringe, labeled lab slips, tray, clean towel (rolled), container with ice, sterile gauze pads, alcohol or betadine swabs, and a cork or cap for the syringe.

STANDARDS

Obtain the required blood sample and send it to the lab without contaminating the sample or causing further injury to the patient.

TRAINING/EVALUATION

Training Information Outline

1. Review the patient's chart for the diagnosis, the medication currently used, previous blood gas tests, and to verify the physician's order for a blood gas analysis. (See Figure 3-35 for normal blood gas values.)

BLOOD GAS VALUES

	Normal	Range
1. pH	7.40	7.35 to 7.45
2. PCO_2	40 mm Hg	35 to 45 mm Hg
3. PO_2	80 mm Hg or greater at sea level	
4. HCO_3	24 mEq/L	22 to 26 mEq/L
5. B.E.	0 mEq/L	-2 to +2 mEq/L

Figure 3-35

2. Identify the patient by asking his or her name and checking his or her armband.

3. Explain the procedure to the patient and answer any questions.

CAUTION

Do not say or do anything that would excite or agitate the patient. To do so will affect the blood gas values obtained.

4. Attach the needle to the syringe and draw sodium heparin into the syringe if a preheparinized syringe is not available. (See task 081-833-0088.)

a. Draw enough sodium heparin into the syringe to lubricate the plunger and barrel.

b. Work the plunger up and down two or three times.

c. Expel all excess sodium heparin by pushing the plunger all the way up.

NOTE: Sufficient sodium heparin will remain in the hub and needle to serve as the anticoagulant for the blood sample.

5. Select the puncture site by determining whether adequate collateral circulation exists using the modified Allen's test.

NOTE: The radial artery is the primary site. The brachial artery is the primary alternate site. The femoral artery lacks collateral circulation; therefore, it would be the next alternate site.

a. Direct the patient to extend one arm, palm up.

b. Locate and palpate the radial and ulnar arteries.

c. Instruct the patient to make a fist to force the blood from the hand area.

d. Apply pressure to the patient's wrist to compress and obstruct both the radial and ulnar arteries.

e. Direct the patient to relax his or her hand but to not fully extend the fingers. The palm and fingers should appear blanched.

f. Release the pressure from the ulnar artery only.

g. Observe the palm, fingers, and thumb to ensure they become flushed within 10 to 15 seconds due to blood return.

NOTE: Flushing of the hand within 10 to 15 seconds verifies that the ulnar artery alone is capable of supplying the entire hand with blood while the radial artery is occluded.

CAUTION

If blood does not return to the patient's hand after removal of occluding pressure from the ulnar artery, check the other wrist before proceeding to the brachial artery.

6. Puncture the radial artery.

a. Position the patient's arm using a rolled or folded towel to hyperextend the arm to expose the puncture site.

b. Clean the skin surface with a 70% isopropyl alcohol pad using a circular motion starting at the center.

NOTE: Use universal precautions such as wearing gloves and eye protection.

c. Locate and palpate the puncture site.

d. Stabilize the artery to prevent movement during puncture by placing the index finger of the free hand over the artery.

e. Hold the heparinized syringe with a 22 gauge needle at a 45° angle to the arm with the bevel up.

f. Tell the patient of the "stick" and insert the needle through the skin into the subcutaneous tissue.

CAUTION

If the needle is advanced too rapidly, it may pass through the artery without obtaining blood.

g. While palpating the artery, advance the needle slightly until blood pulsates into the syringe barrel.

h. Obtain the appropriate blood volume and smoothly withdraw the needle.

NOTE: Draw approximately 1 to 2 millimeters for adults.

WARNING

Do not attempt to recap the needle.

7. Immediately apply pressure to the puncture site for a minimum of five minutes.

CAUTION

If the patient is on anticoagulant therapy such as heparin or Coumadin, pressure may be required for a longer period of time to stop the bleeding.

a. Observe the area to ensure that the bleeding has stopped.

NOTE: If bleeding persists, apply firm pressure to the site and elevate the wrist above the patient's head. Then, notify the physician.

CAUTION

Do not allow the patient to compress the puncture site.

b. Apply a bandage to the puncture site.

8. Prepare the blood sample for delivery to the laboratory.

a. Hold the syringe with the needle up.

b. Tap gently on the sides of the syringe to force the air bubbles to the top of the syringe.

c. Gently push in the plunger until blood appears at the tip of the needle to expel any air present.

d. Plug the needle with a cork or remove the needle from the syringe and place a rubber cap over the end of the syringe.

e. Gently roll the syringe between the hands or between the fingers and thumb to mix the blood.

9. Label the blood sample with the following information:

a. Patient's name.

b. Patient's identification number.

c. Time the sample was drawn.

d. Fractional inspired oxygen concentration (FIO_2).

10. Place the syringe in a plastic bag or cup of crushed ice and immediately deliver the sample to the blood gas laboratory for proper analysis.

11. Record the procedure on the consultation form.

NOTE: If the patient is intubated and receiving mechanical ventilation, information regarding positive end expiratory pressure, tidal volume, respiratory rate, etc., should also be recorded.

Evaluation Guide

Performance Measures	Results	
1. Review the patient's chart and consultation form.	P	F
2. Identify the patient.	P	F
3. Explain the procedure to the patient.	P	F
4. Attach the needle to the syringe.	P	F
5. Select the puncture site.	P	F
6. Puncture the artery.	P	F
7. Immediately apply pressure to the puncture site.	P	F
8. Prepare the blood sample.	P	F
9. Label the blood sample.	P	F
10. Deliver the sample to the laboratory.	P	F
11. Record the procedure.	P	F

REFERENCES: None

081-830-3018

PERFORM ARTERIAL BLOOD GAS INTERPRETATION

CONDITIONS

You have obtained the results from an arterial blood gas analysis. Necessary materials and equipment: consultation form and arterial blood gas lab slip.

STANDARDS

Given arterial blood gas values, interpret the blood gas results to include the presence of hypoxemia.

TRAINING/EVALUATION

Training Information Outline

DEFINITIONS

1. Acidosis: a pH less than 7.35.
2. Alkalosis: a pH greater than 7.45.
3. Respiratory Acidosis: PCO_2 greater than 45 mm Hg due to hypoventilation (lungs retaining CO_2).
4. Respiratory Alkalosis: PCO_2 less than 35 mm Hg due to hyperventilation (lungs eliminating CO_2).
5. Metabolic Acidosis: a decrease in base excess (B.E.) below normal range (kidneys eliminating HCO_3).
6. Metabolic Alkalosis: an increase in base excess (B.E.) above normal range (kidneys retaining HCO_3).
7. Hypoxemia: an arterial O_2 tension (PO_2) below normal, for example, less than (<) 80 mm Hg at sea level; different at varying altitudes.

1. Obtain the arterial blood gas results.
2. Determine the disease state of the pH.
   a. If the pH is less than 7.35, it is considered acidosis.

b. If the pH is greater than 7.45, it is considered alkalosis.

NOTE: Even if the pH is in the normal range, determine if it is on the acidotic or alkalotic side of 7.40. For example, a pH of 7.36 is normal but is closer to the acidotic side of the pH scale.

3. Identify which component is the cause of the disease state.

a. Respiratory.

(1) If the PCO_2 has risen above 45 mm Hg and if the pH indicates the disease state is acidosis, it is considered a respiratory acidosis.

(2) If the PCO_2 has fallen below 35 mm Hg and if the pH indicates the disease state is alkalosis, it is considered a respiratory alkalosis.

b. Metabolic.

(1) If the B.E. (Base Excess) has risen above 2 mEq/L and if the pH indicates the disease state is alkalosis, it is considered a metabolic alkalosis provided the PCO_2 is not also contributing to the problem.

(2) If the B.E. has fallen below -2 mEq/L and if the pH indicates the disease state is acidosis, it is considered a metabolic acidosis provided the PCO_2 is not also contributing to the problem.

NOTE: Often the PCO_2 may be compensating for a metabolic problem by rising above 45 mm Hg in alkalosis and falling below 35 mm Hg for acidosis.

c. Mixed. When both the PCO_2 and the B.E. are contributing to the diseased condition, the interpretation would be a mixed alkalosis or acidosis.

4. Determine the degree of compensation.

a. Partially compensated.

(1) Determine which component is causing the problem, PCO_2 or B.E.

(2) Look at the other component to see if it is outside its normal range. If it is and if the pH is outside the normal range, then this condition is partially compensated.

b. Fully compensated.

(1) Determine if the pH is on the acidotic or alkalotic side of the normal range.

(2) Determine which component is causing the problem, PCO_2 or B.E.

(3) Look at the other component to see if it is outside its normal range. If it is and if the pH is in the normal range, then the condition is considered fully compensated.

c. Uncompensated.

(1) Determine which component is causing the problem, PCO_2 or B.E.

(2) Look at the other component to see if it is outside its normal range. If it is not and if the pH is outside its normal range, then the condition is considered uncompensated.

5. Determine the degree of hypoxemia.

a. If the PO_2 is greater than 80 mm Hg, the condition is without hypoxemia.

b. If the PO_2 is between 60 and 80 mm Hg, the condition is mild hypoxemia.

c. If the PO_2 is between 40 and 59 mm Hg, the condition is moderate hypoxemia.

d. If the PO_2 is less than 40 mm Hg, the condition is severe hypoxemia.

NOTE: Example: pH 7.44, PCO_2 24, PO_2 65, HCO_3 16, B.E. -6. The complete interpretation would be a fully compensated respiratory alkalosis with mild hypoxemia.

6. Record lab results on the consultation form.

Evaluation Guide

Performance Measures	**Results**	
1. Obtain the arterial blood gas results.	P	F
2. Determine the disease state of the pH.	P	F
3. Identify which component is the cause of the disease state.	P	F
4. Determine the degree of compensation.	P	F
5. Determine the degree of hypoxemia.	P	F
6. Record lab results on the consultation form.	P	F

REFERENCES: None

081-830-3009

SET UP A PRESSURE/VOLUME CYCLED VENTILATOR

CONDITIONS

A ventilator is set up and checked for proper functioning before placing it on standby. Necessary materials and equipment: ventilator with test lung and patient circuit, ventilator check sheet, any special adapters and/or monitors, cover, humidifier, 50 psi gas source, and electrical outlet (if applicable).

STANDARDS

Set up and check the ventilator for proper functioning before storage.

TRAINING/EVALUATION

Training Information Outline

1. Assemble equipment.

   a. Assemble the patient circuit in accordance with the manufacturer's instructions packed with each patient circuit. Connect the circuit to the ventilator.

   b. Connect additional special adapters, if required by the physician's order.

   c. Add external alarms and monitoring devices, as necessary.

2. Plug the ventilator into an electrical source, if applicable.

3. Connect the ventilator to a 50 psi gas source.

4. Turn on the ventilator.

5. Perform a pressure check on the circuit.

   a. Adjust the peak flowrate to 20 lpm.

   b. Adjust the high pressure limit to 80 cm H_2O.

NOTE: Certain types of ventilators may require adjustment of the working pressure, for example, Servo.

   c. Check for leaks in the circuit by aseptically occluding the circuit at the patient connector during the inspiratory phase. Monitor the appropriate gauges and alarms for leaks.

NOTE: There should be a steady rise in the needle of the manometer until it reaches the pressure limit, at which time the ventilator should cycle into the expiratory phase. If a leak is found in the patient circuit, obtain a new circuit and repeat steps 1 through 5.

6. Check to ensure all appropriate systems are functioning properly.

NOTE: In order to check the tidal volume, a Wright's respirometer or another type of spirometer device along with a test lung may be necessary.

7. Reset all controls to 0 and unplug the ventilator from the gas and/or electrical source, as applicable.
8. Fill out the ventilator check sheet.
    a. Check all appropriate boxes.
    b. Initial the check sheet.
    c. Date and indicate the time of the procedure.
    d. Attach the check sheet on the ventilator.
9. Cover the ventilator to protect it while in storage.

Evaluation Preparation

Setup: For training and evaluation test with the model of ventilator that is used most often at the soldier's job site.

Brief soldier: Tell the soldier to set up the ventilator.

Evaluation Guide

Performance Measures	**Results**	
1. Assemble equipment.	P	F
2. Plug the ventilator into an electrical source, if applicable.	P	F
3. Connect to a gas source.	P	F
4. Turn on the ventilator.	P	F
5. Perform a pressure check.	P	F
6. Check appropriate systems.	P	F

Performance Measures	Results
7. Reset the controls.	P F
8. Fill out the check sheet.	P F
9. Cover the ventilator.	P F

REFERENCES: None

081-830-3011

PROVIDE ASSIST VENTILATION

CONDITIONS

You have performed a patient care handwash and have obtained the physician's order. Necessary materials and equipment: consultation form, ventilator, patient circuit, ventilator flow sheet, 50 psi gas source, sterile water, and electrical source.

STANDARDS

Provide and monitor assist ventilation without causing further injury to the patient.

TRAINING/EVALUATION

Training Information Outline

1. Read and verify the order on the consultation form.
2. Identify the patient by his or her armband.
3. Explain the procedure to the patient.
4. Plug the ventilator into the electrical source, if applicable.
5. Connect the ventilator to a 50 psi gas source.
6. Turn the ventilator on.
7. Select the assist mode on the ventilator.
8. Set the proper tidal volume or pressure limit as ordered by the physician.

NOTE: If the tidal volume is not provided, calculate the minimum required volume by using the following formula:

Patient's weight in kilograms (kg) x 10 = Tidal volume in ml.

The patient's kg weight is determined by dividing the weight in pounds by 2.2. For example, the minimum tidal volume for a 170 pound individual would be calculated as follows: 170 divided by 2.2 = 77.28 kg. Tidal volume in ml = 77.28 kg x 10 or 772.8 ml. Calculation of the maximum tidal volume is computed in the same manner as the minimum tidal volume with the exception that the patient's weight in kg is multiplied by 15 instead of 10.

9. Remove the test lung and attach the patient circuit to the patient's tracheostomy tube or endotracheal tube.

10. Adjust the ventilator's sensitivity control so the patient must draw a negative 1 to 2 cm H_2O pressure to trigger a ventilator breath.

11. Adjust the peak flow to meet the patient's required inspiratory flow.

NOTE: The goal in establishing a ventilatory pattern is to find the lowest system pressure at the lowest flowrate that will deliver the desired minute ventilation at a safe I:E ratio.

a. The needle should rise smoothly without being pulled below the baseline, once inspiration begins.

b. Adjust for adequate inspiratory/expiratory ratio, if necessary.

NOTE: Normal I:E ratios for adults are in the range 1:1.5 to 1:3. At normal rates and tidal volumes, inspiratory flowrates of 40 to 50 liters per minute will provide for I:E ratios in the normal adult range. Higher flowrates tend to result in a poor distribution of gases within the lungs as well as requiring higher driving pressures. This increases gas compression and less volume reaches the patient. Reduced flowrates may produce better gas distribution and lower driving pressures, but they will also increase inspiratory time and raise the mean intrathoracic pressure.

12. Set and check all controls to ensure that the patient is ventilated properly.

NOTE: Patient comfort is of the utmost importance. Observe the patient and communicate with him or her if possible. Adjustments in flowrate can make a big difference in the patient's adjustment to mechanical ventilation.

13. Set and check all alarms to ensure that the patient is properly monitored.

14. Readjust the ventilator to fulfill the physician's order.

NOTE: The respiratory specialist must continually monitor the patient and ventilator.

Evaluation Guide

Performance Measures	**Results**	
1. Read and verify the order.	P	F
2. Identify the patient.	P	F
3. Explain the procedure.	P	F
4. Plug the ventilator into the electrical source, if applicable.	P	F
5. Connect the ventilator to a 50 psi gas source.	P	F
6. Turn the ventilator on.	P	F

Performance Measures	Results	
7. Select the assist mode.	P	F
8. Set the proper tidal volume or pressure.	P	F
9. Remove the test lung and attach the patient circuit to the patient.	P	F
10. Adjust the ventilator's sensitivity control.	P	F
11. Adjust the peak flow.	P	F
12. Set and check all controls.	P	F
13. Set and check all alarms.	P	F
14. Readjust the ventilator to fulfill the physician's order.	P	F

REFERENCES: None

081-830-3010

PROVIDE CONTINUOUS VENTILATION

CONDITIONS

You have performed a patient care handwash and have obtained the physician's order. Necessary materials and equipment: consultation form, ventilator with test lung and patient circuit, ventilator flow sheet, 50 psi gas source, electrical source, and sterile water.

STANDARDS

Provide continuous ventilation without causing further injury to the patient.

TRAINING/EVALUATION

Training Information Outline

1. Read and verify the order on the consultation form.
2. Identify the patient by his or her armband.
3. Set the required ventilator controls.
   a. Tidal volume or pressure limit. (See task 081-830-3011.)
   b. Ventilatory rate.
   c. Oxygen percentage.
   d. Positive end expiratory pressure (PEEP).
   e. Mode of ventilation.

(1) Control - ventilator initiates inspiration; both frequency and depth of tidal volume are preset; the patient is unable to alter or influence any portion of the ventilatory cycle.

(2) Assist - ventilator has capability to initiate a positive pressure breath in response to an effort made by the patient; frequency is determined by patient, tidal volume is preset; the patient is unable to alter or influence any portion of the volume.

(3) Assist/Control - combines patient triggering with a mechanically set rate as a "backup"; allows the patient to establish a breathing rate by assisting or triggering the mechanical breath; tidal volume is preset; the patient is unable to alter or influence any portion of the volume.

(4) Intermittent Mandatory Ventilation (IMV) - combines a controlled mechanical rate and volume with the patient's own spontaneous rate and desired volume; spontaneous breathing occurs between the preset mechanical breaths.

(5) Synchronized Intermittent Mandatory Ventilation (SIMV) - same as IMV except that the mechanical breaths are synchronized with the patient's inspiratory efforts; prevents the stacking of breaths.

(6) Pressure Control (PC) - the delivery of mandatory breaths, but at a preset inspiratory pressure and time or I:E ratio. The volume and flow to the patient may vary on a breath-to-breath basis depending on changes in the patient's compliance and airway resistance.

(7) Continuous Positive Airway Pressure (CPAP) - the application of airway pressures greater than ambient to the spontaneously breathing patient during inspiration and exhalation; no mechanical breaths involved.

4. Remove the test lung and attach the patient circuit to the patient's tracheostomy tube or endotracheal tube.

5. Adjust the following controls:

a. High pressure limit.

(1) Minimum--10 cm H_2O above the peak inspiratory pressure.

(2) Maximum--15 cm H_2O above the peak inspiratory pressure.

WARNING

Failure to adjust the high pressure limit will compromise patient safety.

b. Peak flow. (See task 081-830-3011.)

c. Set the temperature so that it does not exceed the normal body temperature of 98.6° F or 37° C.

6. Set any additional ventilator controls, as appropriate.

7. Check all controls for the correct settings and make any adjustments necessary to meet the physician's orders.

8. Set and test any additional alarms.

a. Low inspiratory pressure (LIP): set at 3 to 5 cm H_2O below peak inspiratory pressure.

b. Low PEEP/CPAP pressure: set at a few cm H_2O below PEEP/CPAP setting.

c. Low exhaled tidal volume: set at 80% of the tidal volume setting or the patient's spontaneous volume, whichever is lower.

d. Low exhaled minute volume: set at 80% of the minute volume setting.

e. High respiratory rate: set at 20% above observed rate.

NOTE: Some ventilators are not equipped with various alarms and may require the use of external monitoring devices.

9. Readjust the ventilator to meet the patient's demands, as necessary.

10. Fill out the ventilator flow sheet.

a. Patient/ventilator rate.

b. Oxygen percentage.

c. Peak flow.

d. Peak inspiratory pressure.

e. Tidal volume.

f. PEEP.

g. Mode of ventilation.

h. Temperature of the ventilator patient tubing.

i. High pressure limit.

j. Most recent arterial blood gas values, if available.

11. Monitor the ventilator and the patient.

a. Every 30 minutes until stable.

b. At a minimum of every two hours after stability is attained.

Evaluation Guide

Performance Measures	Results	
1. Read and verify the order.	P	F
2. Identify the patient.	P	F
3. Set the required ventilator controls.	P	F
4. Remove the test lung and attach the circuit to the patient.	P	F
5. Adjust the following controls: high pressure limit, peak flow, and temperature.	P	F
6. Set any additional ventilator controls.	P	F
7. Check all controls.	P	F
8. Set and test any additional alarms.	P	F
9. Readjust the ventilator to meet the patient's demands.	P	F
10. Fill out the ventilator flow sheet.	P	F
11. Monitor the ventilator and the patient.	P	F

REFERENCES: None

081-830-3019

CHANGE OUT VENTILATION THERAPY EQUIPMENT DURING CONTINUOUS VENTILATION

CONDITIONS

An assistant is available. Necessary materials and equipment: disposable ventilator circuit, disposable corrugated tubing, humidifier, sterile water, manual resuscitator, flowmeter, oxygen extension tubing, oxygen, disposable gloves, alcohol pads, tape, and bacteria filter.

STANDARDS

Change out the patient's ventilatory circuit while maintaining aseptic technique and without causing further injury or discomfort to the patient. Complete steps 8 through 18 in order.

TRAINING/EVALUATION

Training Information Outline

1. Read and verify orders for current ventilator settings.

2. Explain the procedure to the patient and answer any questions about the procedure.

NOTE: Be sure to inform the patient that an assistant will be assisting him or her to breathe with the manual resuscitator during the time he or she is off the ventilator.

3. Wash hands and put on gloves.

4. Gather and assemble equipment.

NOTE: Assemble the equipment as much as possible before taking it to the patient's bedside.

a. Take the equipment to the ventilator to be changed out (use a cart if possible).

CAUTION

Do not place clean equipment on the floor.

b. Attach the flowmeter to the oxygen source.

c. Connect the manual resuscitator to the flowmeter with the extension tubing.

d. Set the oxygen flowrate to the maximum setting.

NOTE: Give the resuscitator to the assistant standing by.

5. Check the maximum peak pressure, volume delivered, and exhaled volume returned.

6. Auscultate the patient and check the heart rate on the monitor. (See task 081-830-3005.)

NOTE: If there is water in the tubing, drain it away from the patient.

7. Detach the old circuit from the support arm and stabilize it to the bedrail with tape.

NOTE: Another way to do this is to remove only one side of tubing from the support arm.

8. Bypass the heated humidifier.

   a. Loosen the tubing coming from the inspiratory filter outlet and from the humidifier outlet.

   b. Remove the tubing from both areas simultaneously and place the inspiratory limb from the humidifier outlet onto the filter outlet.

NOTE: This maneuver should be attempted during the mechanical expiratory phase.

9. Perform a 3 point check.

   a. Check the monitor for possible heart rate fluctuations.

   b. Observe the patient for signs of discomfort.

   c. Check the maximum peak pressure, volume delivered, and exhaled volume.

NOTE: Minor heart rate changes are common reactions due to patient anxiety. Reassure and calm the patient.

WARNING

If an adverse reaction occurs or the ventilator fails to function properly, disconnect the patient from the tubing and manually ventilate him or her until the problem is corrected. Then, notify your supervisor.

10. Change out humidifier components.

    a. Remove the old humidifier with the 3 section tubing and place it in the sink.

    b. Attach the new humidifier.

    c. Fill the humidifier with sterile water.

    d. Attach the new 3 section tubing to the inspiratory side of the humidifier.

e. Attach the inspiratory side of the new circuit to the humidifier outlet.

f. Attach the new circuit to the support arm.

g. Remove the temperature probe/thermometer from the old circuit and seal the hole with a plug.

h. Perform a 3 point check.

i. Wipe the thermometer/temperature probe with an alcohol pad and insert it into the proper area of the new circuit.

NOTE: Remind the patient that your assistant will help him or her to breathe.

11. Disconnect the patient from the ventilator and have your assistant attach the resuscitator and start ventilating the patient.

WARNING

Ensure proper functioning of the resuscitator before continuing.

CAUTION

The amount of time allotted for the patient to be off the ventilator should not exceed two minutes.

12. Change out the ventilator circuit.

a. Disconnect the inspiratory side tubing and filter from the ventilator.

b. Connect the new filter to the inspiratory side of the ventilator.

c. Connect the open end of the 3 section piece of tubing from the humidifier to the open end of the inspiratory filter.

d. Disconnect the exhalation side tubing and let the tubing fall to the floor.

CAUTION

Some ventilator circuits have additional tubing for the airway pressure and exhalation valve. Disconnect the old tubing and connect the new circuit's tubing to the appropriate connection.

e. Connect the exhalation side of the new tubing to the ventilator.

13. Pressure check the circuit.

a. Set the peak flow to 20 lpm.

b. Set the pressure limit to 80 cm H_2O.

c. Aseptically occlude the opening of the patient connector.

d. If the pressure limit is not reached, find and correct the leak.

e. If the pressure limit is met, return the peak flow and pressure limit to the original values.

NOTE: The respiratory rate may need to be decreased if the decrease in peak flow causes an inspiratory time greater than 75% of the respiratory cycle.

14. Have the assistant disconnect the manual resuscitator.

15. Attach the new circuit onto the patient's artificial airway.

16. Perform a 3 point check to ensure patient comfort and proper functioning of the ventilator.

NOTE: Make a mental note of the peak pressure and exhaled volume. They should be close to what they were prior to beginning the changeout.

17. Auscultate for bilateral breath sounds.

18. Reset the alarms.

WARNING

Do not walk away from the ventilator until the alarms are properly reset.

19. Chart the circuit change on the ventilator flow sheet.

20. Remove the old circuit and discard the disposable parts.
NOTE: Place the reusable parts on the bottom part of the cart (if available) or in a plastic bag to go back for proper cleaning.

21. Discard gloves and wash hands.

22. Chart the changeout on the patient's consultation form.

Evaluation Guide

Performance Measures	Results	
1. Read and verify the orders for current ventilator settings.	P	F
2. Explain the procedure to the patient.	P	F
3. Wash hands and put on gloves.	P	F
4. Gather and assemble the equipment.	P	F
5. Check the maximum peak pressure, volume delivered, and exhaled volume returned.	P	F
6. Auscultate the patient.	P	F
7. Detach the old circuit from the support arm.	P	F
8. Bypass the humidifier.	P	F
9. Perform a 3 point check.	P	F
10. Change out humidifier components.	P	F
11. Disconnect the patient.	P	F
12. Change out the ventilator circuit.	P	F
13. Pressure check the circuit.	P	F
14. Disconnect the manual resuscitator.	P	F
15. Attach the patient connector to the artificial airway.	P	F
16. Perform a 3 point check.	P	F
17. Auscultate the patient.	P	F
18. Reset all alarms.	P	F
19. Complete steps 8 through 18 in order.	P	F
20. Chart the circuit change on the ventilator flow sheet.	P	F
21. Remove and discard the old circuit.	P	F

Performance Measures	Results
22. Discard gloves and wash hands.	P F
23. Chart the changeout on the consultation form.	P F

REFERENCES: None

081-830-3012

REMOVE A PATIENT FROM A VENTILATOR

CONDITIONS

You have performed a patient care handwash and have obtained the physician's order. Necessary materials and equipment: consultation form, ventilator cover, bag valve system, 50 psi gas source, aerosol therapy device, suction equipment, and suction catheter. Additional materials and equipment, if applicable: ABG kit, Wrights respirometer with adapters, and pressure gauge.

STANDARDS

Perform all procedures without causing further injury or unnecessary discomfort to the patient or damage to the equipment.

TRAINING/EVALUATION

Training Information Outline

1. Read and verify the order on the consultation form.
2. Identify the patient by his or her armband.
3. Explain the procedure to the patient.
4. Verify that the patient meets the criteria for weaning.

NOTE: If no weaning parameters have been done, obtain the additional equipment and materials as needed and perform the procedures.

CAUTION

If no arterial blood gases have been done, obtain a physician's order prior to performing the procedure.

a. Arterial blood gases.

(1) A PO_2 greater than 70 mm Hg at an FIO_2 of 0.40.

NOTE: A PO_2 greater than 250 mm Hg on an FIO_2 of 1.00; an A-a gradient of no more than 300-350 mm Hg on an FIO_2 of 1.00; or a shunt fraction less than 15% are also acceptable.

(2) A PCO_2 that is acceptable for that patient.

NOTE: An acceptable PCO_2 for some patients, for example a COPD patient, may not be within normal range, especially if preparing them to return to breathing on their own.

(3) A pH between 7.35 and 7.45.

b. Respiratory rate of 25 breaths per minute or less.

NOTE: Rate and tidal volume are subject to change after extubation.

c. Inspiratory effort (IE) of at least -20 cm H_2O.

NOTE: A normal IE is greater than -80 cm H_2O within 10 seconds.

d. Vital capacity (VC) of 10 to 15 cc/kg of body weight.

e. Minute ventilation (MV) - should be less than 10 lpm. Maximal voluntary ventilation (MVV) - should be double the MV.

f. Deadspace/tidal volume (VD/VT) ratio - less than 0.60.

NOTE: A normal VD/VT is .33 to .35 and increases with age.

$$VD/VT = \frac{PCO_2 - P_ECO_2}{PCO_2}$$

g. Compliance greater than 30 ml/cm H_2O.

CAUTION

If any of the parameters are outside the normal guidelines, recheck the orders with the physician.

NOTE: These weaning parameters are only guidelines to assess if the patient is capable of being removed from the ventilator. Additional consideration must be given to other clinical data to include the patient's psychological and nutritional status.

5. Disconnect the ventilator from the patient's tracheostomy tube or endotracheal tube.

6. Start aerosol therapy. (See task 081-830-3017.)

CAUTION

When beginning aerosol therapy, ensure the fractional inspired oxygen concentration (FIO_2) is increased by 10% over the last ventilator setting. For example, if the ventilator setting is at 30% FIO_2, increase the aerosol device to 40% FIO_2.

NOTE: Ensure that a stream of aerosol is visible during the inspiratory phase while the patient is spontaneously breathing. If the aerosol is not detected, it indicates that the total flow of gas is insufficient to meet the patient's inspiratory demands.

7. Take and record the patient's vital signs.
8. Place the ventilator on standby at the patient's bedside.
    a. Turn the ventilator off, leave it connected to the gas and power source, and leave all settings set.
    b. Cover the patient adapter to prevent contamination.
    c. Place a cover over the ventilator.
9. Perform an arterial puncture 20 to 30 minutes after aerosol therapy has started. (See task 081-830-3006.)
10. Report the findings to the physician.
11. Record all findings on the consultation form.

Evaluation Guide

Performance Measures	**Results**	
1. Read and verify the orders.	P	F
2. Identify the patient.	P	F
3. Explain the procedure to the patient.	P	F
4. Verify that the patient meets the criteria for weaning.	P	F
5. Disconnect the ventilator from the patient.	P	F
6. Start aerosol therapy.	P	F
7. Take and record the patient's vital signs.	P	F

Performance Measures	Results	
8. Place the ventilator on standby.	P	F
9. Perform an arterial puncture.	P	F
10. Report the findings to the physician.	P	F
11. Record all findings on the consultation form.	P	F

REFERENCES: None

APPENDIX A

RESPIRATORY THERAPY EQUATIONS

			NORMAL
RQ	=	CO_2/O_2	0.8
CaO_2	=	$Hgb(1.34 \times SaO_2) + PaO_2(.003)$	20 vol%
PAO_2	=	$FIO_2(BP-H_2O) - PCO_2/.8$	100 mm Hg
TF	=	$LPM(.79/FIO_2 - .21)$	lpm
O_2 Flow	=	$TF(FIO_2 - .21/.79)$	lpm
FIO_2	=	O_2 flow + air flow(.21)/TF	%
Raw	=	PIP - PLAT/PF/60	0.6-2.4 cm H_2O/L/sec
a/A	=	PaO_2/PAO_2	0.8
V_D/Vt	=	$\frac{PCO_2 - P_ECO_2}{PCO_2}$	0.33
C_{DYN}	=	$Vt - \frac{(PIP - PEEP)T.C.}{PIP - PEEP}$	L/cm H_2O
C_{STAT}	=	$Vt - \frac{(PLAT - PEEP)T.C.}{PLAT - PEEP}$	L/cm H_2O
Ideal V_E	=	$\frac{\text{Actual } PCO_2 \times \text{actual } V_E}{\text{desired } PCO_2}$	lpm
FIO_2 Estimation	=	PAO_2 desired = $\frac{PaO_2 \text{ desired}}{a/A \text{ ratio}}$	
		$FIO_2 = \frac{PAO_2 + (PCO_2/RQ)}{(BP - PH_2O)}$	

GLOSSARY

SECTION I

DEFINITION OF TERMS

Army Training and Evaluation Program (ARTEP). The ARTEP is the US Army's collective training program. ARTEP establishes unit training objectives critical to unit survival and performance in combat. It combines the training and the evaluation process into one integrated function. The ARTEP is a training program and not a test. The sole purpose of external evaluation under this program is to diagnose unit requirements for future training.

Collective training. Collective training prepares cohesive teams and units to accomplish their combined arms and services missions on the integrated battlefield.

Common task. A critical task for which all soldiers at a given skill level are accountable, regardless of their MOS.

Critical task. A task which is essential for accomplishment of the unit mission, successful individual skill performance, and/or survival in battle, that requires training.

Cross training. Cross training allows an individual the opportunity to train in additional jobs within his or her MOS.

Drill. A drill is a standardized technique or procedure which serves as a link between individual and collective proficiency. There are battle, crew, and situational drills.

Individual training. Individual training is training which the officer, NCO, or soldier receives in the training base, units, on the job, or by self-study. This training prepares the individual to perform specified duties or tasks related to the assigned or next higher specialty code of MOS skill level and duty position.

Integration training. Integration training is the completion of initial entry training in skill specific tasks for an individual newly arrived in a unit, but limited specifically to tasks associated with the mission, organization, and equipment of the unit to which the individual is assigned. It may be conducted by the unit using training materials supplied by the school, by troop schools, or by inservice or contract mobile training teams. In all cases, this training is supported by the school proponent.

Merger training. Merger training prepares an NCO to supervise one or more different MOSs at lower skill levels when the soldier advances in skill level in his career management field.

Mission essential task list. A compilation of collective mission essential tasks which must be successfully performed if an organization is to accomplish its wartime mission(s).

Self-development. Self-development is a planned, progressive, and sequential program followed by leaders to enhance and sustain their military competencies. Self-development consists of individual study, research, professional reading, practice, and self-assessment.

Performance measures. Performance measures are those behaviors/product characteristics which the trainer observes/checks to determine if the soldier has performed the task correctly.

Shared task. A shared task is any critical task performed by soldiers from two or more MOSs.

Sustainment training. The provision of instruction and opportunities for practice to ensure that individual or collective task proficiency is maintained at a requisite level. The frequency will vary with individual and collective tasks; the role, location, and personnel fill of the unit; and the desires of the commander.

Train-up. Train-up is the process of increasing the skills and knowledge of an individual to a higher skill level in the appropriate MOS. It may involve certification.

Unit training. Unit training is training (individual, collective, and joint or combined) conducted in a unit.

SECTION II

ACRONYMS AND ABBREVIATIONS

ARTEP	Army Training and Evaluation Program
ATPD	ambient temperature, ambient pressure, dry
B.E.	base excess
BTPS	body temperature, ambient pressure, saturated with water vapor
BVM	bag-valve-mask
C	Centigrade
CaO_2	content of arterial oxygen
cc	cubic centimeter
C_{DYN}	dynamic compliance
cm H_2O	centimeter of water
CMS	Centralized Materiel Service/Section
CO_2	carbon dioxide
CPR	cardiopulmonary resuscitation
C_{STAT}	static compliance

CTT	common task test
ERV	expiratory reserve volume
ET	endotracheal
ETO	ethylene oxide
F	Fahrenheit
FIO_2	fractional inspired oxygen concentration
FRC	functional residual capacity
FVC	forced vital capacity
HCO_3	bicarbonate
IAW	in accordance with
IC	inspiratory capacity
IE	inspiratory effort
IM	intramuscular
IMV	intermittent mandatory ventilation
IRV	inspiratory reserve volume
ITEP	Individual Training Evaluation Program
IV	intravenous
kg	kilogram
lpm	liters per minute
mEq/L	milliequivalent per liter
METL	mission essential task list
mg	milligram
ml	milliliter

mm Hg	millimeters of mercury
MOS	military occupational specialty
MOSC	military occupational specialty code
MTP	MOS training plan
MV	minute volume
MVV	maximum voluntary ventilation
NBC	nuclear, biological, chemical
NCO	noncommissioned officer
PAO_2	partial pressure of alveolar oxygen
PaO_2	partial pressure of arterial oxygen
PCO_2	partial pressure of arterial carbon dioxide
P_ECO_2	partial pressure of exhaled carbon dioxide
PEEP	positive end expiratory pressure
pH	negative common logarithm of molar hydrogen ion concentration
PIP	peak inspiratory pressure
psi	pounds per square inch
Raw	airway resistance
RH	relative humidity
RR	respiratory rate
RV	residual volume
SaO_2	arterial oxygen saturation
SL	skill level
SM	soldier's manual

SMCT	soldier's manual of common tasks
SOP	standing operation procedure
SQ	subcutaneously
STPD	standard temperature (0°C), standard pressure (760 mm Hg), dry
SVC	slow vital capacity
T.C.	tubing compliance
TG	trainer's guide
TLC	total lung capacity
VC	vital capacity
V_D	volume of deadspace
V_{Danat}	volume of anatomical deadspace
V_{Dphys}	volume of physiological deadspace

REFERENCES

New reference material is being published all the time. Present references, as listed below, may become obsolete. To keep up-to-date, see the DA Pam 25-30 (FICHE) publications and Extension Training Materials (ETM) catalog DA Pam 350-100. If referenced documents are not available through your unit, borrow them from your post learning center or library.

Required References

None

Related References

Army Training and Evaluation Program (ARTEP)

8-705-MTP	Mission Training Plan for the Combat Support Hospital
8-715-MTP	Mission Training Plan for the Field Hospital
8-725-MTP	Mission Training Plan for the General Hospital (500 Bed)
8-765-30-MTP	Mission Training Plan for the Mobile Army Surgical Hospital

Department of the Army Pamphlet (DA Pam)

DA Pam 351-20	Correspondence Course Program Catalog

Field Manuals (FM)

FM 8-230	Medical Specialist
FM 25-4	How to Conduct Training Exercises
FM 25-5	Training for Mobilization and War
FM 25-100	Training the Force
FM 25-101	Battle Focused Training

Soldier Training Publications (STP)

STP 21-1-SMCT	Soldier's Manual of Common Tasks (Skill Level 1)
STP 21-24-SMCT	Soldier's Manual of Common Tasks (Skill Levels 2/3/4)

DA Form

DA Form 2028	Recommended Changes to Publications and Blank Forms

STP 8-91V14-SM-TG
3 OCTOBER 1995

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Active Army, USAR, and ARNG: To be distributed in accordance with DA Form 12-11E, requirements for STP 8-91V14-SM-TG, *Respiratory Specialist* (Qty rqr block no. 3171)

*U.S. GOVERNMENT PRINTING OFFICE: 1995 628-027/40009