



CPR/AED for the Professional Rescuer

I HAVE:

*given more safety demonstrations
than I can count, kept my neighbor's
home from burning to the ground,
and saved 26 lives.*



Trained. Empowered. Prepared.

Build Your Lifesaving Skills with Additional Training from the American Red Cross



Be prepared for any emergency with superior training from the American Red Cross.

First Aid

American Red Cross first aid training provides the knowledge to manage sudden illness and the skills to care for a variety of injuries, including severe bleeding and broken bones.

Administering Emergency Oxygen

Course length: 2 hours, 25 minutes

Certification: 1 year

Learn when and how to use emergency oxygen and breathing devices including bag-valve-mask resuscitators.

Bloodborne Pathogens Training: Preventing Disease Transmission

Course length: 1 hour, 35 minutes

Certification: 1 year

Learn how bloodborne pathogens are spread, how to prevent exposures and what to do if exposed to infectious materials. This course complies with the training component of OSHA's Bloodborne Pathogens Standard.

Training is also available in the use of epinephrine auto-injectors and asthma inhalers.



**American
Red Cross**

Register Today!

For more information or to sign up for training in your community, contact your CPR/AED for the Professional Rescuer instructor or your local American Red Cross chapter, visit www.redcross.org or call (800) 667-2968.



**American
Red Cross**

CPR/AED for the Professional Rescuer



Daniel Cima

This participant's manual was developed and produced through the combined efforts of the American Red Cross, external reviewers and StayWell. Without the commitment to excellence of both employees and volunteers, this manual could not have been created.

StayWell®

A MediMedia USA Company

StayWell®

A MediMedia USA Company



**American
Red Cross**

Copyright © 2006 by The American National Red Cross

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior permission from American Red Cross National Headquarters, Products and Health and Safety Services.

American Red Cross certificates may be issued upon successful completion of a training program, which uses this textbook as an integral part of the course. By itself, the text material does not constitute comprehensive Red Cross training. In order to issue ARC certificates, your instructor must be authorized by the American Red Cross and must follow prescribed policies and procedures. Make certain that you have attended a course authorized by the Red Cross. Ask your instructor about receiving American Red Cross certification, or contact your local chapter for more information.

The content in this text reflects the 2005 Consensus on Science for CPR and Emergency Cardiovascular Care (ECC) and the Guidelines 2005 for First Aid.

The emergency care procedures outlined in this book reflect the standard of knowledge and accepted emergency practices in the United States at the time this book was published. It is the reader's responsibility to stay informed of changes in the emergency care procedures.

Printed in the United States of America.
Composition by Graphic World, Inc.
Printing/Binding by Banta Book Group.

StayWell
780 Township Line Rd.
Yardley, PA 19067

ISBN:1-58480-304-5

Library of Congress Cataloging-in-Publication Data

CPR/AED for the professional rescuer. -- 3rd ed.

p. ; cm.

Includes bibliographical references.

ISBN 1-58480-304-5

1. CPR (First aid) 2. Automated external defibrillation.

I. American Red Cross.

[DNLM: 1. Cardiopulmonary Resuscitation--methods. 2. Defibrillators. WA 292 C8817 2006]

RC87.9.C743 2006

616.1'025--dc22

2006014677

06 07 08 09 10 / 9 8 7 6 5 4 3 2

THE AMERICAN RED CROSS' ADVISORY COUNCIL ON FIRST AID AND SAFETY

In late 1998, the American Red Cross formed an independent panel of nationally recognized health and safety experts known as the Advisory Council on First Aid and Safety (ACFAS). Drawing on a body of collective expertise from such diverse fields as emergency medicine, occupational health, sports medicine, school health, emergency medical services response, disaster mobilization and education, ACFAS was designed as a conduit to establish the standard in first aid care. ACFAS was charged to advise the Red Cross in areas related to the development and dissemination of audience-appropriate information and skills training in first aid and safety.

According to the National First Aid Science Advisory Board, of which the Red Cross is a founding member, first aid is defined as assessments and interventions that can be performed by a bystander (or performed by the patient) with minimal or no medical equipment. A first aid provider is a person with formal first aid, emergency care or medical training (or the patient) who provides assessments and interventions that can be performed by a bystander (or performed by the patient) with minimal or no medical equipment.

TOGETHER WE PREPARE

The American Red Cross mission is to provide relief to victims of disaster and help people prevent, prepare for and respond to emergencies. But we need your help. There are five actions that every organization, individual and family should take to better prepare themselves for an emergency or disaster, these include—

Make a plan. Everyone should design a Family Disaster Plan. The Family Disaster Plan focuses on both families and individuals.

Build a kit. For your home and workplace, assemble a Disaster Supplies Kit, which contains items that you may need if you are 1) confined to your home or place of work for an extended period (e.g., after a disaster or winter storm) or 2) told to evacuate on short notice.

Get trained. Participate in first aid, CPR and AED training and attend Red Cross Community Disaster Education presentations.

Volunteer. Give your time through volunteering.

Give blood. Become a regular and frequent blood donor to ensure a blood supply that meets all needs, all of the time.

For more information visit www.redcross.org

ACKNOWLEDGMENTS

The American Red Cross CPR/AED for the Professional Rescuer program and supporting materials were developed through the dedication of both employees and volunteers. Their commitment to excellence made this program possible.

The American Red Cross team for this edition included:

Pat Bonifer

Director
Research and Product Development

Jennifer Deibert

Project Manager
Research and Product Development

Mike Espino

Manager
Research and Product Development

Greta Petrilla

Manager
Communication and Marketing

John Hendrickson

Senior Associate
Chapter Business Development and Sales Support

Tom Heneghan

Senior Associate
Program Administration and Support

Steve Lynch

Senior Associate
Business Planning

Marc Madden

Senior Associate
Research and Product Development

Lindsay Oaksmith

Senior Associate
Research and Product Development

Kelly Fischbein

Associate
Evaluation

Rhadames Avila

Administrative Assistant
Research and Product Development

Betty J. Butler

Administrative Assistant
Research and Product Development

The StayWell team for this edition included:

Nancy Monahan

Senior Vice President

Bill Winneberger

Senior Director of Manufacturing

Paula Batt

Executive Director
Sales and Business Development

Reed Klanderud

Executive Director
Marketing and New Product Development

Shannon Bates

Managing Editor

Lorraine P. Coffey

Senior Developmental Editor

Kate Plourde

Marketing Manager

Stephanie Weidel

Senior Production Editor

The following members of the American Red Cross Advisory Council on First Aid and Safety (ACFAS) also provided guidance and review:

David Markenson, MD, FAAP, EMT-P

Chair, Advisory Council on First Aid and Safety (ACFAS)
Chief Pediatric Emergency Medicine
Maria Fareri Children's Hospital
Westchester Medical Center
Valhalla, New York

Kim Dickerson, EMT-P, RN

Committee Member, Advisory Council on First Aid and Safety (ACFAS)
Fort Myers, Florida

Paul M. Gannon, MS Ed, RN

Committee Member, Advisory Council on First Aid and Safety (ACFAS)
Ambulatory Surgery Staff Nurse, St. Joseph Hospital
Cheektowaga, New York
Health and Safety Instructor
American Red Cross Greater Buffalo Chapter
West Seneca, New York

Claudia Hines, RN

Committee Member, Advisory Council on First Aid and Safety (ACFAS)
Emergency Medical Services for Children
Children's Hospitals and Clinics of Minnesota
Minneapolis, Minnesota

The following individuals provided external review:

Bryan A. Hoffmann, B.A., EMT-B (I)

UMDNJ-EMS
Lead Instructor of EMT-Basic Programs
Newark, New Jersey

Elaine D. Kyte, LPN

Health and Safety Director
American Red Cross Hazleton Chapter
West Hazleton, Pennsylvania

Sean E. Page, MSN, CRNP, CSN

PA EMS Instructor
PA State Fire Academy Instructor
Instructor Trainer
American Red Cross York County Chapter
York, Pennsylvania

Jude F. Younker, B.A., EMT-B

North Flight EMS
Board of Directors Chairman
American Red Cross of Northwestern Michigan Chapter
Traverse City, Michigan

The American Red Cross and StayWell thank Casey Berg, Ted T. Crites, Terri Eudy, Terry Georgia, Ellen Jones, Vincent Knaus, Adreania McMillian, MaryKate Martelon, Cheryl Murray, Craig Reinertson, Jessica Silver, Greg Stockton, Katherine Tunney, Lynn Whittemore and Stephan Widell for their contributions to the development of this program.

PREFACE

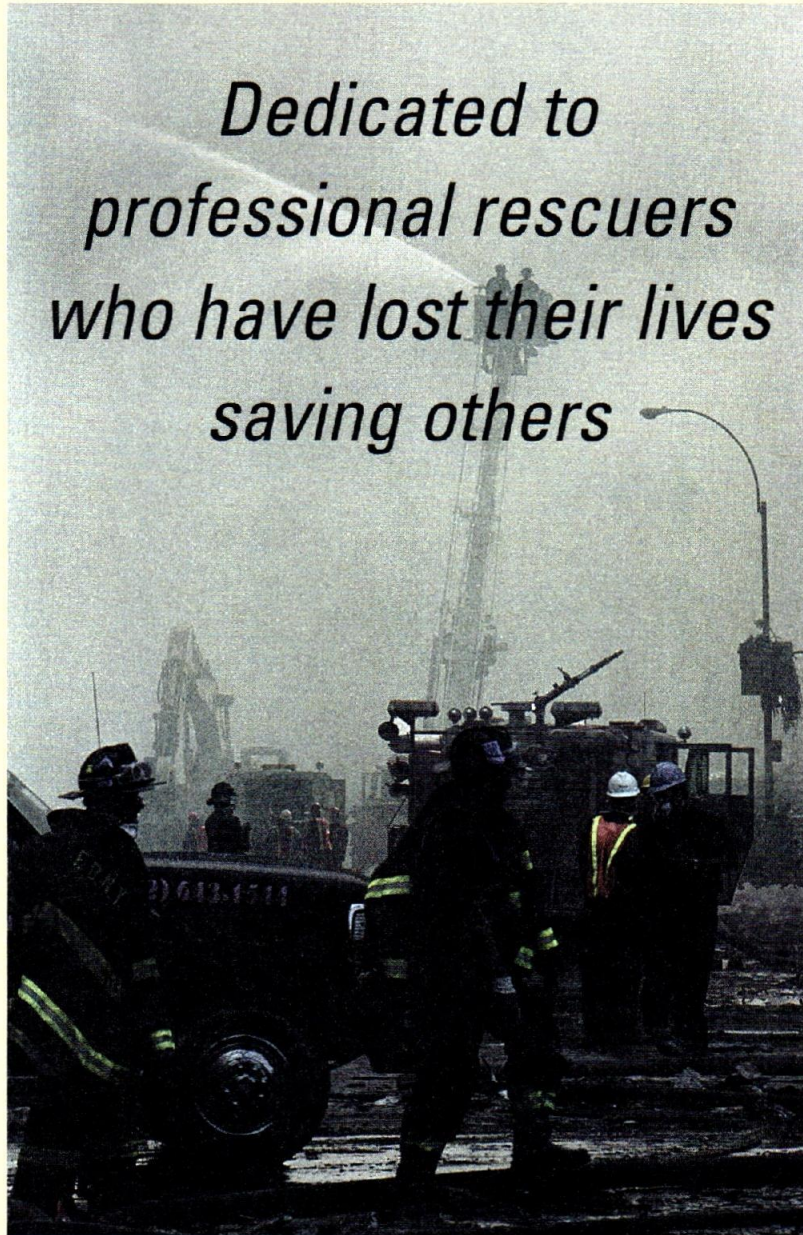
Professional rescuers work as nurses, EMTs, lifeguards, firefighters, first responders, athletic trainers, physicians, health care professionals and numerous other occupations. Despite the wide range of occupations, professional rescuers share a unique responsibility; the responsibility to save lives. This awesome responsibility of saving lives is constantly being tested with new challenges and changes. The skills, knowledge and tools that professional rescuers use to save lives are constantly changing as well.

This new *American Red Cross CPR/AED for the Professional Rescuer Participant's Manual* and course reflect changes based on the *2005 Consensus on Science for CPR and Emergency Cardiovascular Care (ECC) and the Guidelines 2005 for First Aid*. Changes to this program and manual include simplifications to many of the CPR skill sequences, which helps improve retention. There

have also been changes to help improve the quality of CPR. The integration of CPR skills into the operation of AEDs has changed to help improve survival from sudden cardiac arrest. Professional rescuers are now trained to use AEDs on adults and children. Information has been updated and added to this program to help professional rescuers administer epinephrine, aspirin and fixed-flow-rate oxygen.

The skills learned in this course include adult, child and infant rescue breathing, conscious and unconscious choking, CPR, two-rescuer CPR and adult and child AED. Additional training can be added to this course including bloodborne pathogens training and emergency oxygen administration. While the skills and knowledge that professional rescuers use are increasing, this training will help you meet your most important responsibility as a professional rescuer—the responsibility to save lives.

*Dedicated to
professional rescuers
who have lost their lives
saving others*

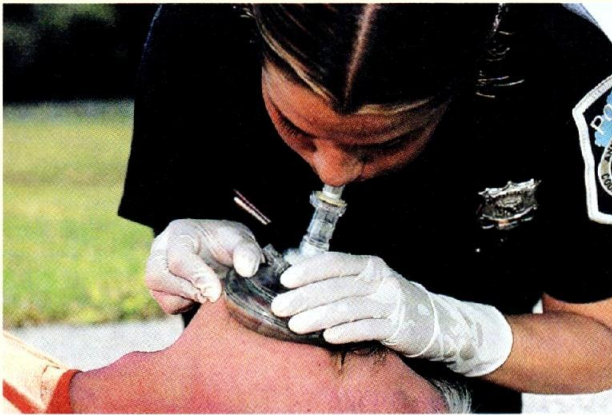


Daniel Cima

TABLE OF CONTENTS

Chapter 1

The Professional Rescuer	1
Responsibilities	2
Personal Characteristics	2
The Emergency Medical Services System	2
Legal Considerations	4
Putting it All Together	5



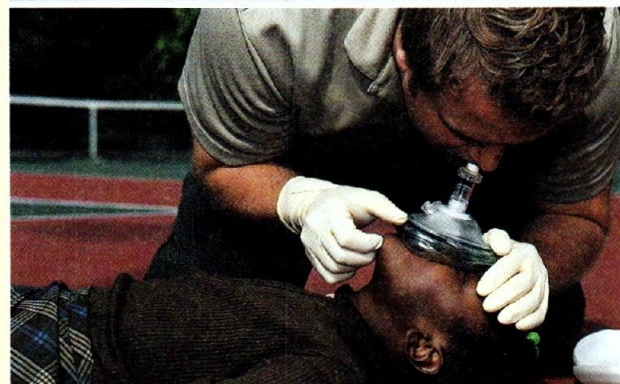
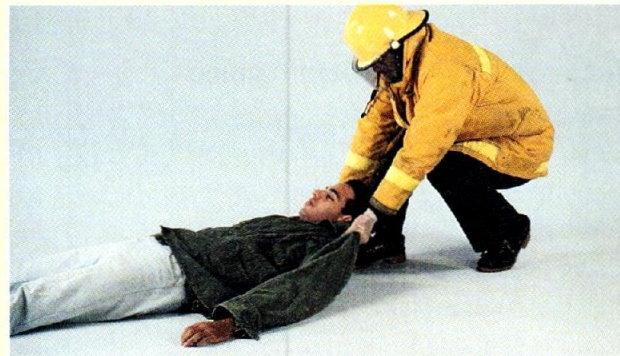
Chapter 2

Bloodborne Pathogens	6
Bloodborne Pathogens	7
How Pathogens Spread	8
Preventing the Spread of Bloodborne Pathogens	10
If You Are Exposed	14
Putting it All Together	14
Skill Sheet—Removing Gloves	15



Chapter 3

Taking Action and Caring for Breathing Emergencies	16
Moving a Victim	19
Breathing Emergencies	22
Rescue Breathing	23
Airway Obstruction	26
Putting it All Together	27
Skill Sheet—Initial Assessment	28
Skill Sheet—Rescue Breathing—Adult	31
Skill Sheet—Rescue Breathing—Child	32
Skill Sheet—Rescue Breathing—Infant	33
Skill Sheet—Using a Bag-Valve-Mask Resuscitator—Two Rescuers	34
Skill Sheet—Conscious Choking—Adult and Child	36
Skill Sheet—Conscious Choking—Infant	38
Skill Sheet—Unconscious Choking—Adult and Child	40
Skill Sheet—Unconscious Choking—Infant	43



Chapter 4

Cardiac Emergencies45

Cardiac Chain of Survival46

CPR48

Automated External Defibrillation51

Administering Emergency Oxygen51

Putting it All Together51

Skill Sheet—CPR—Adult and Child52

Skill Sheet—CPR—Infant54

Skill Sheet—Two-Rescuer CPR—
Adult and Child56

Skill Sheet—Two-Rescuer CPR—Infant58



Chapter 5

Automated External Defibrillation61

The Heart's Electrical System62

When the Heart Stops62

Defibrillation62

AEDs and the Cardiac Chain of Survival63

Using an AED—Adult63

Using an AED—Child63

AED Precautions63

AEDs—Special Situations64

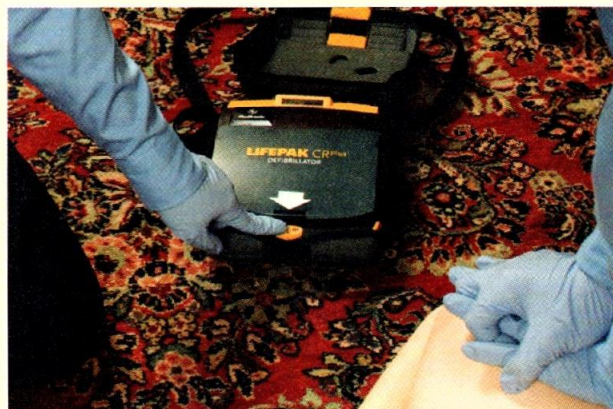
AED Maintenance65

Putting it All Together65

AED Algorithm for the Professional Rescuer66

Skill Sheet—Using an AED—Adult and Child67

Skill Sheet—Using an AED—Adult and Child,
CPR in Progress70



Chapter 6

Administering Emergency Oxygen73

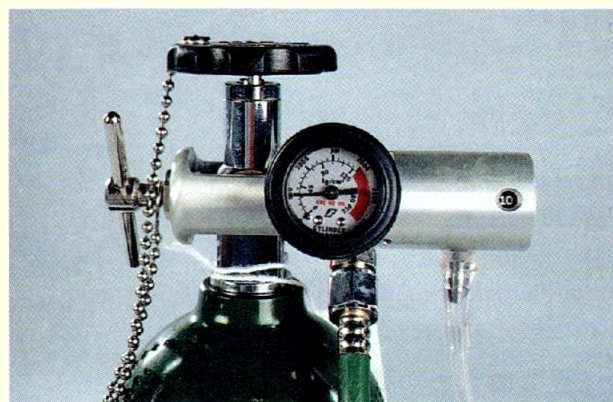
Emergency Oxygen74

Oxygen Delivery Devices76

Putting it All Together77

Skill Sheet—Using a Resuscitation Mask
for Rescue Breathing78

Skill Sheet—Oxygen Delivery81



Appendix A85

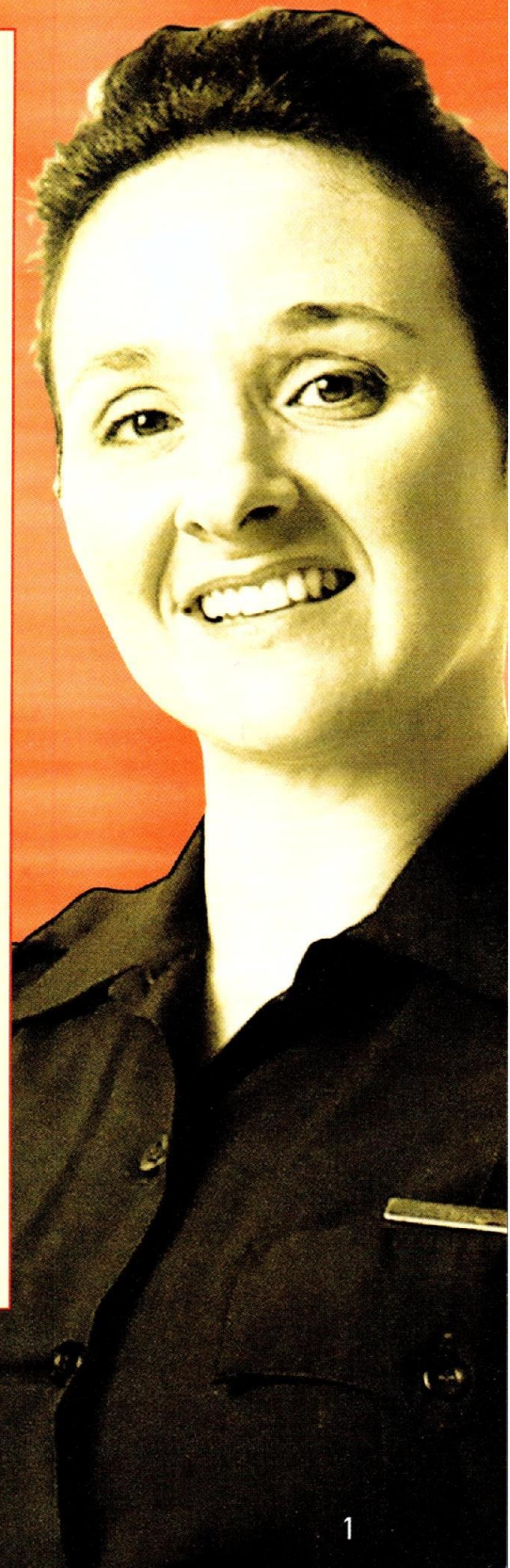
References86

The Professional Rescuer

As a professional rescuer, you are a key part of the emergency medical services (EMS) system. Whether you are paid or volunteer, in your position you will be summoned to provide care in an emergency. Unlike a lay responder, you have a professional duty to act in an emergency and to provide care. Your actions often are critical and may determine whether a seriously injured or ill victim survives. To provide appropriate emergency care, you must have adequate knowledge and skills, as well as self-confidence.

This course is for people who are responsible for delivering emergency care and/or ensuring public safety. The roles of professional rescuers are varied and include the following:

- Allied health-care professionals (medical assistants, physical therapists, respiratory therapists and X-ray technicians)
- Athletic trainers
- Business and industry emergency response teams
- Camp leaders
- Emergency Medical Technicians (Basic, Intermediate, Paramedic)
- Firefighters
- First aid teams
- First responders
- Flight attendants
- Law enforcement personnel
- Lifeguards
- Nurses
- Park rangers
- Physicians
- Physician assistants
- Public safety personnel
- Search-and-rescue teams
- Security personnel
- Ski patrollers



RESPONSIBILITIES

Professional rescuers share important responsibilities that include—

- Having a duty, when on the job, to respond to an emergency.
- Using techniques learned in professional training.
- Ensuring their personal safety and the safety of fellow team members and bystanders.
- Gaining safe access to the victim.
- Determining any threats to the victim's life.
- Summoning more advanced medical personnel when necessary.
- Providing needed care for the victim.
- Assisting more advanced medical personnel.

PERSONAL CHARACTERISTICS

As someone who deals with the public, your responsibilities extend beyond providing care. These include—

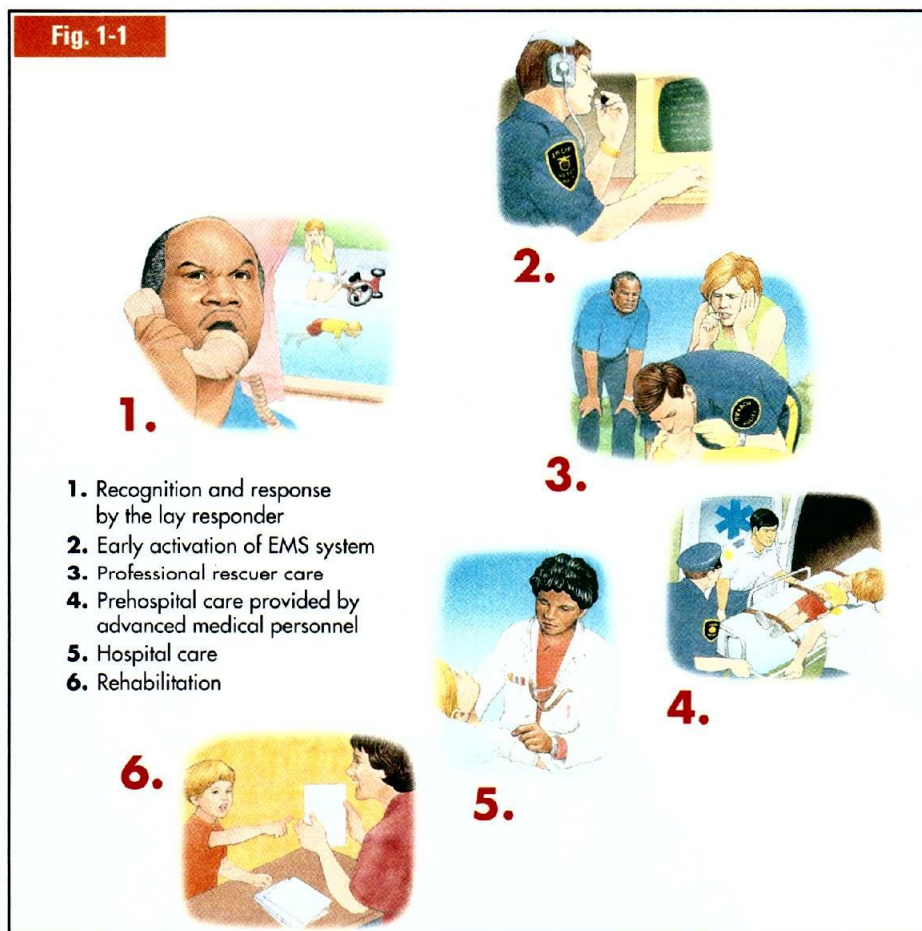
- *Maintaining a professional appearance and attitude.* Working with injured or ill victims is sometimes difficult. Be compassionate, knowing that anger often results from fear. Lay responders who help during an

emergency may also be afraid. Try to be reassuring and thank them for taking action.

- *Keeping your skills and knowledge up to date.* Join professional organizations and take continuing education and refresher trainings.
- *Controlling your own fears.* Try not to reveal your anxieties to the victim or bystanders. The presence of blood, vomit or unpleasant odors is often disturbing. You may need to compose yourself before you act.
- *Maintaining a healthy lifestyle.* Job stress can adversely affect your health. Exercise and diet help you manage your physical, mental and emotional stress. Maintain a healthy lifestyle both on and off the job.

THE EMERGENCY MEDICAL SERVICES SYSTEM

The emergency medical services (EMS) system is a network of community resources and medical personnel that provides emergency care to victims of injury or sudden illness (**Fig. 1-1**). The first step in the EMS system is activated when someone recognizes that an emergency has occurred and takes action. Depending on the situation, a professional rescuer might perform the first



step in the EMS system. You and other highly trained professionals then provide additional care to injured or ill victims as needed. The basic purpose of the EMS system is to bring rapid medical care to victims of life-threatening injuries or illness. You, as a professional rescuer, play a critical role in this system. The survival and recovery of the critically injured or ill depends on—

1. Recognition and response by the lay responder.
2. Early activation of the EMS system.
3. Professional rescuer care.
4. Prehospital care provided by advanced medical personnel.
5. Hospital care.
6. Rehabilitation.

Recognition and Response by the Lay Responder

The first step in the EMS system is recognition and response by a lay responder. This person recognizes the emergency and responds by dialing 9-1-1 or a local emergency number. Lay responders frequently provide first aid and cardiopulmonary resuscitation (CPR) to injured or ill victims while waiting for more highly trained medical personnel to arrive and take over. Often the care provided by lay responders in these first few minutes is critical.

Early Activation of the EMS System

The next step involves the lay responder calling 9-1-1 or the local emergency number to activate the EMS system. A dispatcher quickly determines what help is needed and dispatches the appropriate EMS personnel. The dispatcher may also provide instructions about what care to give before advanced medical personnel arrive.

Professional Rescuer Care

Typically, next to arrive on the scene are professional rescuers trained to provide a higher level of care than lay responders. These rescuers are trained to assess the victim's condition more effectively and to take appro-

priate actions, which include caring for life-threatening conditions. Their care often provides a critical transition between a lay responder's initial actions and the care provided by more advanced medical personnel.

Prehospital Care Provided by Advanced Medical Personnel

Emergency medical technicians (EMTs) comprise the next step in the EMS system. Depending on the level of training and certification (basic, intermediate or paramedic), EMTs provide more advanced care and life-support techniques. Paramedics provide the highest level of prehospital care and serve as the field extension of the emergency care physician. Regardless of the level of training, the EMT's role is to reassess the victim's condition and to provide appropriate care until the victim reaches the hospital.

Hospital Care

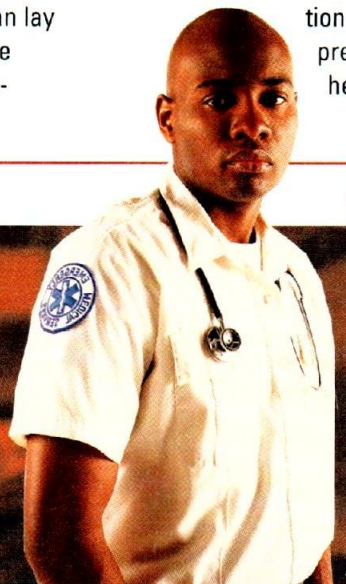
When the victim arrives at the emergency or trauma department, physicians, nurses and other highly skilled professionals take over care. Most hospital emergency departments are staffed by emergency department physicians trained to care for the acutely injured or ill. In addition, other specially trained personnel may also provide care to further stabilize a critically injured or ill victim. These medical specialists include cardiologists, orthopedic surgeons, neurosurgeons, trauma surgeons and allied health-care professionals, such as respiratory therapists, radiology technicians and laboratory technicians. Once stabilized, the victim may be transferred to another department within the hospital to receive more specialized care.

Rehabilitation

Rehabilitation is often the final step in the EMS system. This phase begins after the acute medical problem has been corrected. The goal of rehabilitation is to return the victim to his or her previous state of health. Additional health-care professionals, including family physicians, consulting specialists, social workers and therapists, may work together to rehabilitate the victim.

REMEMBER:

Survival is the result of an EMS system in which all participants fulfill their roles.



Supporting the EMS System

The EMS system depends on all of these people performing their roles promptly and correctly. When each part of the system is working effectively, the victim's chances for a full recovery

are improved. Lay responders must recognize emergencies, quickly activate the EMS system and then take action within the first critical minutes. Professional rescuers must respond quickly and effectively to emergencies when they are summoned. In a serious injury or illness, survival and recovery are not a matter of chance. Survival is the result of an EMS system in which all participants fulfill their roles. For this reason, it is important for professional rescuers to keep their training current and stay abreast of new issues and developments in emergency care.

LEGAL CONSIDERATIONS

Many people are concerned about lawsuits. However, lawsuits against those who provide care at the scene of an emergency are highly unusual and rarely successful. Being aware of basic legal principles and proper emergency medical care can help you avoid legal action.

Following are some important legal principles involved in emergency care. Because laws vary from state to state, you should inquire about your state's specific laws.

- **Duty to Act**—Most professional rescuers, by case law, statute or job description, have a duty to act at the scene of an emergency. This duty applies to public safety officers as well as licensed and certified professionals while on duty. Failure to adhere to this duty could result in legal action.
- **Scope of Practice**—When called upon to act at the scene of an emergency, you may only act within your scope of practice. The scope of practice is the set of skills and knowledge that you have acquired in training and that you are authorized by your certification to practice. The scope of practice establishes the limit of care that you can legally provide. This limit may vary from state to state. Therefore, you should learn about the expectations for your area.
- **Standard of Care**—The public expects a certain level of knowledge and skill from personnel summoned to provide emergency care. This level is called the *standard of care*. For example, the standard of care for cer-

tified first responders and EMTs is based on the training guidelines developed by the U.S. Department of Transportation and by the states and municipalities in which they serve. Other authorities, such as national organizations, may also play a role in developing these standards. The standard of care requires you to—

- Communicate proper information and warnings to help prevent injuries.
- Recognize a victim in need of care.
- Attempt to rescue a victim needing assistance.
- Provide emergency care according to your level of training.
- **Negligence**—If you do not follow the standard of care or your failure to act results in someone being injured or causes further harm to the victim, you may be considered negligent. Negligence includes—
 - Failing to provide care.
 - Providing care beyond your scope of practice or level of training.
 - Providing inappropriate care.
 - Failing to control or stop any behaviors that could result in further harm or injury.
- **Good Samaritan Laws**—The vast majority of states and the District of Columbia have Good Samaritan laws that protect people who willingly give emergency care without accepting anything in return. These laws, which differ from state to state, may protect people from legal liability if they act in good faith, are not negligent and act within their scope of training. However, because of their “duty,” professional rescuers are not usually considered Good Samaritans. Check your local and state laws to see if Good Samaritan laws protect you.
- **Consent**—Before providing care to a conscious victim, you must first obtain his or her consent. For a minor, you must obtain consent from a parent or guardian. To obtain consent—
 - State your name.
 - Tell the victim you are trained to help and what level of training you have.
 - Ask the victim if you can help.
 - Explain to the victim that you would like to assess him or her to find out what is wrong.
 - Explain what you plan to do.

The vast majority of states and the District of Columbia have Good Samaritan laws that protect people who willingly give emergency care without accepting anything in return.

Continue to get consent as you give care. If the victim does not give consent or later withdraws it, summon more advanced medical personnel. A victim who is unconscious, confused or seriously ill may not be able to give consent. In these situations, consent is implied, meaning the law assumes this person would give consent if able to do so. The same is true for minors when a parent or guardian is not present.

- **Refusal of Care**—Some injured or ill victims, even those who desperately need assistance, may refuse

care. Even though the victim may be seriously injured or ill, you must honor his or her wishes. However, you should explain why he or she needs care and what may happen if he or she does not seek medical attention. A parent, if present, can refuse care for a minor. If a witness is available, have him or her listen to, and document in writing, any refusal of care.

- **Advanced Directives**—These are written instructions that describe the wishes of a person regarding medical treatment or health-care decisions in the event the person becomes incapacitated and can no longer express his or her wishes. Advanced directives include do-not-resuscitate (DNR) orders, living wills and durable powers of attorney. Professional rescuers are required to comply with state laws regarding advanced directives. They should receive this specific training from their employer, agency or medical director, as all types of advanced directives are not recognized in every state. Guidance for advanced directives, including any required identification and verification process is documented in state, regional or local laws, statutes and/or protocols.
- **Battery**—Battery is the unlawful, harmful or offensive touching of a person without the person's consent. You must obtain consent before touching a victim.
- **Abandonment**—Once you begin providing care, you must continue until someone with equal or more advanced training arrives and takes over. You can be held legally responsible for abandoning a victim who requires ongoing care, if you leave the scene of an emergency or stop providing care.
- **Confidentiality**—While providing care, you may learn something about an injured or ill victim that is private and confidential. Do not share this information with anyone except EMS personnel directly associated with the victim's medical care. Become familiar with the Health Insurance Portability and Accountability Act of 1996 that was created by the federal government. Sharing personal information with individuals not directly associated with a victim's medical care may constitute a breach in the victim's privacy.
- **Documentation**—By documenting injuries and incidents, you establish a written record of the events that

took place, care you gave and facts you discovered after the incident occurred. This is important for several reasons.

- It assists more advanced medical personnel when they arrive on the scene and can help speed up their care. It becomes part of the victim's overall record of care, along with the report completed by advanced medical personnel.
- If a legal action occurs in the future, a written report can provide legal documentation of what you saw, heard and did at the scene.
- Documentation of injuries and incidents is also useful when analyzing current response practices and protocols and planning preventative action for the future.

Many agencies have printed forms, while others use electronic forms for documentation. Be familiar with your agency's forms and how to complete them.

- Complete the forms as soon as possible after the incident occurs. As time passes, you are likely to forget critical details.
- Be neat and accurate, and record the facts of the incident, not opinion.
- Sign, date and keep a copy of your report, even if you provide care when not on duty.

PUTTING IT ALL TOGETHER

In a serious injury or illness, the victim's survival and recovery are not a matter of chance. Survival depends on a carefully orchestrated series of events in which all participants fulfill their roles within the EMS system. Each part of the EMS system needs to work effectively to increase the victim's chances for a full recovery. You, as a professional rescuer, play a critical role in this system. In your role as an emergency care provider, you are guided by certain legal parameters, such as the duty to act and professional standards of care. Be aware of the legal considerations as you fulfill your duty as a professional rescuer.

Bloodborne Pathogens

WOULD YOU KNOW WHAT TO DO?

A man has collapsed in the lobby of an office building. He is bleeding from the mouth and face. Vomit and blood are on the floor around him. "His face hit the floor when he fell," a bystander says. He does not appear to be breathing. Do you know how to respond and what you can do to protect yourself from possible disease transmission?

To help prevent disease transmission, you need to understand how infections occur, how diseases are spread from one person to another and what you as a professional rescuer can do to protect yourself and others. Infectious diseases are spread from infected people and from animals, insects or objects that have been in contact with them. Professional rescuers must protect themselves and others from infectious diseases.



BLOODBORNE PATHOGENS

Bloodborne pathogens are bacteria and viruses present in blood and body fluids, which can cause disease in humans. Bacteria and viruses are the most common forms of pathogens. They are found almost everywhere in our environment. Bacteria can live outside the body and commonly do not depend on other organisms for life. If a person is infected by bacteria, antibiotics and other medications often are used to treat the infection. Viruses depend on other organisms to live. Once viruses are in the body, they are difficult to kill. That is why prevention is so critical. The bloodborne pathogens of primary concern to professional rescuers are the hepatitis B virus, hepatitis C virus and human immunodeficiency virus (HIV) (Table 2-1).

Hepatitis B

Hepatitis B is a liver infection caused by the hepatitis B virus. Hepatitis B may be severe or even fatal and it can be in the body for up to 6 months before symptoms appear. These may include flu-like symptoms such as fatigue, abdominal pain, loss of appetite, nausea, vomiting and joint pain. Later-stage symptoms include jaundice (a yellowing of the skin and eyes).

Medications are available to treat chronic hepatitis B infection, but they do not work for everyone. The most effective means of prevention is the hepatitis B vaccine. This vaccine, which is given in a series of

three doses, provides immunity to the disease. Scientific data show that hepatitis B vaccines are very safe for adults, children and infants. There is no confirmed evidence indicating that hepatitis B vaccine causes chronic illnesses.

The hepatitis B vaccination series must be made available to all employees who have occupational exposure. It must be made available within 10 working days of initial assignment, after appropriate training has been completed. However, employees may decide not to have the vaccination. If an employee decides not to be vaccinated, he or she must sign a form affirming this decision.

Hepatitis C

Hepatitis C is a liver disease caused by the hepatitis C virus. It is the most common chronic bloodborne infection in the United States. Its symptoms are similar to hepatitis B infection, including fatigue, abdominal pain, loss of appetite, nausea, vomiting and jaundice. There is no vaccine against hepatitis C and no treatment available to prevent infection after exposure. Hepatitis C is the leading cause of liver transplants. For these reasons, hepatitis C is more serious than hepatitis B.

HIV

The human immunodeficiency virus (HIV) is the virus that causes acquired immunodeficiency syndrome (AIDS). HIV attacks white blood cells and destroys the body's ability

TABLE 2-1 HOW BLOODBORNE PATHOGENS ARE TRANSMITTED

Disease	Signs and Symptoms	Mode of Transmission	Infective Material
Hepatitis B	Jaundice, fatigue, abdominal pain, loss of appetite, nausea, vomiting, joint pain.	Direct and indirect contact	Blood, semen
Hepatitis C	Jaundice, fatigue, dark urine, abdominal pain, loss of appetite, nausea.	Direct and indirect contact	Blood, semen
HIV	May or may not be signs and symptoms in early stage. Late-contact stage symptoms may include fever, fatigue, diarrhea, skin rashes, night sweats, loss of appetite, swollen lymph glands, significant weight loss, white spots in the mouth or vaginal discharge (signs of yeast infection) and memory or movement problems.	Direct and possibly indirect	Blood, semen, vaginal fluid, breast milk

to fight infection. This weakens the body's immune system. The infections that strike people whose immune systems are weakened by HIV are called *opportunistic infections*. Some opportunistic infections include severe pneumonia, tuberculosis, Kaposi's sarcoma and other unusual cancers.

People infected with HIV may not feel or look sick. A blood test, however, can detect the HIV antibody. When an infected person has a significant drop in a certain type of white blood cells or shows signs of having certain infections or cancers, he or she may be diagnosed as having AIDS. These infections can cause fever, fatigue, diarrhea, skin rashes, night sweats, loss of appetite, swollen lymph glands and significant weight loss. In the advanced stages, AIDS is a very serious condition. People with AIDS eventually develop life-threatening infections and can die from these infections. Currently, there is no vaccine against HIV.

There are many other illnesses, viruses and infections that a responder may be exposed to. Keep immunizations current, have regular physical checkups and be knowledgeable about other pathogens. For more information on illnesses listed above and other diseases and illnesses of concern, contact the Centers for Disease Control and Prevention (CDC) at (800) 342-2437 or at www.cdc.gov

HOW PATHOGENS SPREAD

Exposures to blood and other body fluids occur across a wide variety of occupations. Health-care workers, emergency response personnel, public safety personnel and other workers can be exposed to blood through injuries from needles and other sharps devices, as well as by direct and indirect contact with skin and mucous membranes. For any disease to be spread, including blood-borne diseases, all four of the following conditions must be met:

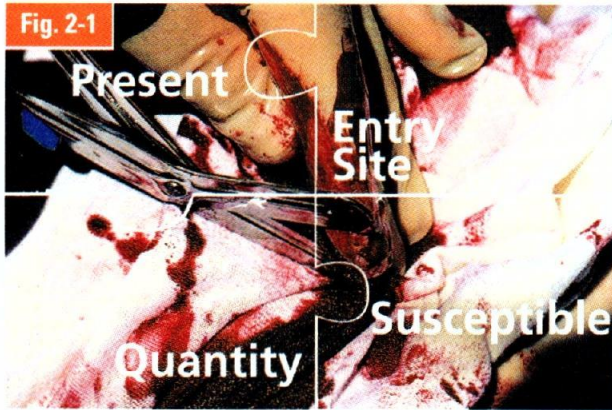
- A pathogen is present.
- A sufficient quantity of the pathogen is present to cause disease.
- A person is susceptible to the pathogen.
- The pathogen passes through the correct entry site (e.g., eyes, mouth and other mucous membranes; non-intact skin or skin pierced by needlesticks, human bites, cuts, abrasions and other means).

To understand how infections occur, think of these four conditions as pieces of a puzzle (**Fig. 2-1**). All of the pieces must be in place for the picture to be complete. If any one of these conditions is missing, an infection cannot occur.

Disease-Causing Agents

Pathogen	Diseases and Conditions They Cause
Viruses	Hepatitis, measles, mumps, chicken pox, meningitis, rubella, influenza, warts, colds, herpes, HIV (the virus that causes AIDS), genital warts, smallpox, Avian flu
Bacteria	Tetanus, meningitis, scarlet fever, strep throat, tuberculosis, gonorrhea, syphilis, chlamydia, toxic shock syndrome, Legionnaires' disease, diphtheria, food poisoning, Lyme disease, anthrax
Fungi	Athlete's foot, ringworm, histoplasmosis
Protozoa	Malaria, dysentery, cyclospora, giardiasis
Rickettsia	Typhus, Rocky Mountain spotted fever
Parasitic Worms	Abdominal pain, anemia, lymphatic vessel blockage, lowered antibody response, respiratory and circulatory complications
Prions	Creutzfeldt-Jakob disease (CJD) or bovine spongiform encephalopathy (mad cow disease), kuru
Yeasts	Candidiasis

For additional information on these or other diseases, visit the Centers for Disease Control and Prevention (CDC) Web site at www.cdc.gov



Bloodborne pathogens such as hepatitis B, hepatitis C and HIV are spread primarily through direct or indirect contact with infected blood or other body fluids. While these diseases can be spread by sexual contact through infected body fluids, such as vaginal secretions and semen, these body fluids are not usually involved in occupational transmission. Hepatitis B, hepatitis C and HIV are not spread by food or water or by casual contact such as hugging or shaking hands. The highest risk of occupational transmission is unprotected direct or indirect contact with infected blood.

Direct Contact

Direct contact transmission occurs when infected blood or body fluids from one person enters another person's body at a correct entry site. For example, direct contact transmission can occur through infected blood splashing in the eye or from directly touching the body fluids of an infected person and that infected blood or other body fluid enters the body through a correct entry site (Fig. 2-2).



Indirect Contact

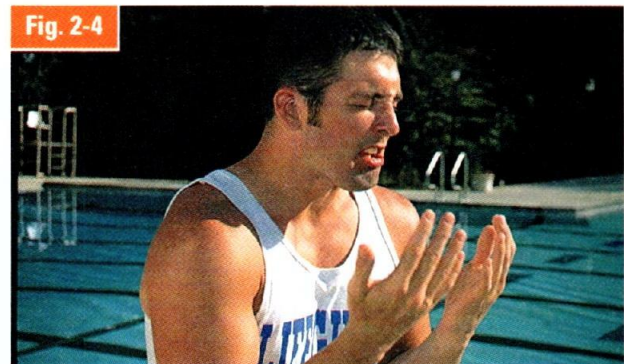
Some bloodborne pathogens are also transmitted by indirect contact (Fig. 2-3). Indirect contact transmission can occur when a person touches an object that contains the blood or other body fluid of an infected person and that infected blood or other body fluid enters the body through a correct entry site. These objects include soiled dressings, equipment and work surfaces that are contaminated



with an infected person's blood or other body fluids. For example, indirect contact can occur when a person picks up blood-soaked bandages with a bare hand and the pathogens enter through a break in the skin on the hand.

Droplet and Vector-Borne Transmission

Other pathogens, such as the flu virus, can enter the body through droplet transmission (Fig. 2-4). This occurs when a person inhales droplets from an infected person's cough or sneeze. Vector-borne transmission (Fig. 2-5) of diseases, such as malaria and West Nile virus, occurs when the body's skin is penetrated by an infectious source such as an animal or insect bite or sting.



Risk of Transmission

Hepatitis B, hepatitis C and HIV share a common mode of transmission—direct or indirect contact with infected blood or body fluids—but they differ in the risk of trans-

mission. Workers who have received the hepatitis B vaccine and have developed immunity to the virus are at virtually no risk for infection by the hepatitis B virus. For an unvaccinated person, the risk for infection from a needlestick or cut exposure to hepatitis B-infected blood can be as high as 30 percent, depending on several factors. In contrast, the risk for infection after a needlestick or cut exposure to hepatitis C-infected blood is about 2 percent and the risk of infection after a needlestick or cut exposure to HIV-infected blood is less than 1 percent.

PREVENTING THE SPREAD OF BLOODBORNE PATHOGENS

OSHA Regulations

The federal Occupational Safety and Health Administration (OSHA) has issued regulations about on-the-job exposure to bloodborne pathogens. OSHA determined that employees are at risk when they are exposed to blood or other body fluids. OSHA therefore requires employers to reduce or remove hazards from the workplace that may place employees in contact with infectious materials.

OSHA regulations and guidelines apply to employees who may come into contact with blood or other body substances that could cause an infection. These regulations apply to you as a professional rescuer because you are expected to give emergency care as part of your job. OSHA has revised its regulations to include the requirements of the federal Needlestick Safety and Prevention Act. These guidelines may help you and your employer meet the OSHA bloodborne pathogens standard to prevent transmission of serious diseases. For more information about the OSHA bloodborne pathogens Standard 29 CFR 1910.1030, visit OSHA's Web site at www.osha.gov

Exposure Control Plan

OSHA regulations require employers to have an exposure control plan. This is a written program outlining the protective measures your employer will take to eliminate or minimize employee exposure incidents. The exposure control plan should include exposure determination, methods for implementing other parts of the OSHA standard (e.g., ways of meeting the requirements and record-keeping) and procedures for evaluating details of an exposure incident. The exposure control plan guidelines should be made available to you and should specifically explain what you need to do to prevent the spread of infectious diseases.

Universal, BSI and Standard Precautions

Universal precautions are OSHA-required practices of control to protect employees from exposure to blood and

Employers' Responsibilities

The OSHA regulations on bloodborne pathogens have placed specific responsibilities on employers for protection of employees that include—

- Identifying positions or tasks covered by the standard.
- Creating an exposure control plan to minimize the possibility of exposure and making the plan easily accessible to employees.
- Developing and putting into action a written schedule for cleaning and decontaminating at the workplace.
- Creating a system for easy identification of soiled material and its proper disposal.
- Developing a system of annual training for all covered employees.
- Offering the opportunity for employees to get the hepatitis B vaccination at no cost.
- Establishing clear procedures to follow for reporting an exposure.
- Creating a system of recordkeeping.
- In workplaces where there is potential exposure to injuries from contaminated sharps, soliciting input from non-managerial employees with potential exposure regarding the identification, evaluation and selection of effective engineering and work practice controls.
- If a needlestick injury occurs, recording the appropriate information in the sharps injury log.
 - Type and brand of device involved in the incident.
 - Location of the incident.
 - Description of the incident.
- Maintaining a sharps injury log in such a way that protects the privacy of employees.
- Ensuring confidentiality of employees' medical records and exposure incidents.

other potentially infectious materials. These precautions require that all human blood and certain body substances be treated as if known to be infectious for hepatitis B, hepatitis C, HIV or other bloodborne pathogens. Other approaches to infection control are called *standard precautions* and *body substance isolation (BSI) precautions*. These precautions mean that you should consider all body fluids and substances as infectious. These approaches to infection control can be applied through the use of personal protective equipment, good hand hygiene, engineering controls, work practice controls, proper equipment cleaning and spill cleanup procedures.

Personal Protective Equipment

Personal protective equipment that is appropriate for your job duties should be available in your workplace and should be identified in the exposure control plan. Personal protective equipment includes all specialized clothing, equipment and supplies that keep you from directly contacting infected materials. These include, but are not limited to, breathing barriers (Fig. 2-6), disposable (single-use) gloves, gowns, masks, shields and protective eyewear (Table 2-2).

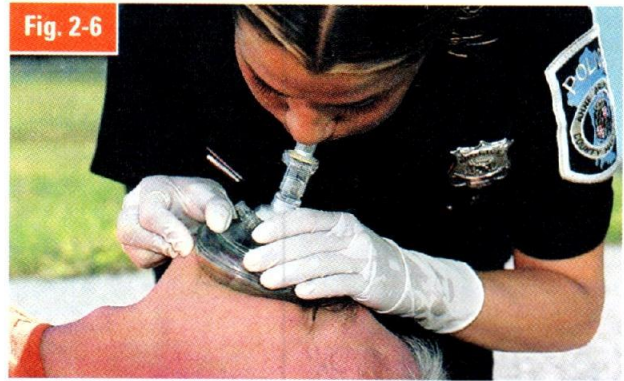


Fig. 2-6

Use disposable gloves made of material such as latex, nitrile or vinyl. Wear disposable gloves when providing care to injured or ill people. For information on glove removal, refer to the Removing Gloves Skill Sheet, page 15. Breathing barriers include resuscitation masks, face shields and bag-valve-mask resuscitators (BVMs). Breathing barriers help protect you against disease transmission when giving rescue breaths to a victim.

TABLE 2-2 RECOMMENDED PROTECTIVE EQUIPMENT AGAINST HEPATITIS B, HEPATITIS C AND HIV TRANSMISSION IN PREHOSPITAL SETTINGS

Task or Activity	Disposable Gloves	Gown	Mask	Protective Eyewear
Bleeding control with spurting blood	Yes	Yes	Yes	Yes
Bleeding control with minimal bleeding	Yes	No	No	No
Emergency childbirth	Yes	Yes	Yes	Yes
Oral/nasal suctioning manually clearing airway	Yes	No	No, unless splashing is likely	No, unless splashing is likely
Handling and cleaning contaminated equipment and clothing	Yes	No, unless soiling is likely	No	No

Department of Health and Human Services, Public Health Services: *A curriculum guide for public safety and emergency response workers prevention of transmission of immunodeficiency virus and hepatitis B virus*, Atlanta, Georgia, February 1989, Dept. Health and Human Services, Centers for Disease Control. With modifications from Nixon, Robert G., *Communicable Diseases and Infection Control for EMS*, Prentice Hall, 2000.

To prevent infection, follow these guidelines:

- Avoid contact with blood and other body fluids.
- Use breathing barriers, such as resuscitation masks, face shields and BVMs, when giving rescue breaths to a victim.
- Wear disposable gloves whenever providing care, particularly if you may come into contact with blood or body fluids.
- Use gloves that are appropriate to the task and provide an adequate barrier.
- Remove jewelry, including rings, before wearing disposable gloves.
- Keep any cuts, scrapes or sores covered before putting on protective clothing.
- Do not use disposable gloves that are discolored, torn or punctured.
- Do not clean or reuse disposable gloves.
- Avoid handling items such as pens, combs or radios when wearing soiled gloves.
- Change gloves before giving care to a different victim.
- In addition to gloves, wear protective coverings, such as a mask, eyewear and gown, whenever you are likely to come in contact with blood or other body fluids that may splash.
- Do not wear gloves and other personal protective equipment away from the workplace.
- Remove disposable gloves without contacting the soiled part of the gloves and dispose of them in a proper container.

Hand Hygiene

Wash your hands before providing care, if possible, so you do not pass pathogens to the victim. Wash your hands frequently and every time after giving care (Fig. 2-7). Hand washing is an effective way to help prevent illness. By washing your hands often, you wash away disease-causing germs that you have picked up from other people, animals or contaminated surfaces. In addition, jewelry, including rings, should not be worn where the potential for risk of exposure exists.



Fig. 2-7

To ensure that you wash your hands correctly, follow these steps:

1. Wet hands with warm water.
2. Apply liquid soap to hands.
3. Rub hands vigorously for at least 15 seconds, covering all surfaces of the hands and fingers. Use soap and warm running water. Scrub nails by rubbing them against the palms.
4. Rinse hands with water.
5. Dry hands thoroughly with a paper towel.
6. Turn off the faucet using the paper towel.

Alcohol-based hand sanitizers and lotions allow you to cleanse your hands when soap and water are not readily available. In addition to washing your hands frequently, keep your fingernails less than one-quarter of an inch long and avoid wearing artificial nails.

Engineering Controls and Work Practice Controls

Engineering controls are control measures that isolate or remove a hazard from the workplace. In other words, engineering controls are the *things you use* in the workplace to help reduce the risk of an exposure incident. Examples of engineering controls include—

- Sharps disposal containers (Fig. 2-8).
- Self-sheathing needles.
- Safer medical devices such as sharps with engineered sharps injury protections or needleless systems.
- Biohazard bags and labels.
- Personal protective equipment.



Fig. 2-8

Work practice controls reduce the likelihood of exposure by changing the way a task is carried out. These are the *things you do* to help reduce the risk of an exposure incident. Examples of work practice controls include—

- Placing sharp items (e.g., needles, scalpel blades) in puncture-resistant, leakproof and labeled containers and having the containers at the point of use.

- Avoiding splashing, spraying and splattering droplets of blood or other potentially infectious materials when performing all procedures.
- Removing and disposing of soiled protective clothing as soon as possible.
- Cleaning and disinfecting all equipment and work surfaces possibly soiled by blood or other body fluids.
- Washing your hands thoroughly with soap and water immediately after providing care, using a utility or restroom sink (not one in a food preparation area).
- Not eating, drinking, smoking, applying cosmetics or lip balm, handling contact lenses or touching your eyes,

The Needlestick Safety and Prevention Act

Blood and other potentially infectious materials have long been recognized as potential threats to the health of employees who are exposed to these materials through penetration of the skin. Injuries from contaminated needles and other sharps have been associated with an increased risk of disease from more than 20 infectious agents. The most serious pathogens are hepatitis B, hepatitis C and HIV. Needlesticks and other sharps injuries resulting in exposure to blood or other potentially infectious materials are a concern because they happen frequently and can have serious health effects.

In 2001, in response to the federal Needlestick Safety and Prevention Act, OSHA revised the Bloodborne Pathogens Standard 29 CFR 1910.1030. The revised standard clarifies the need for employers to select safer needle devices and to involve employees in identifying and choosing these devices. The updated standard also requires employers to maintain a log of injuries from contaminated sharps.

For information on the Needlestick Safety and Prevention Act, visit OSHA's Web site at www.osha.gov

mouth or nose when you are in an area where you may be exposed to infectious materials.

- Using alcohol-based sanitizers or lotions where hand-washing facilities are not available.

You should also be aware of any areas, equipment or containers that may be contaminated. Biohazard warning labels are required on any container holding contaminated materials, such as used gloves, bandages or trauma dressings. Signs should be posted at entrances to work areas where infectious materials may be present.

Equipment Cleaning and Spill Cleanup

After providing care, always clean and disinfect the equipment and surfaces that you used (Fig. 2-9). Handle all soiled equipment, supplies and other materials with care until they are properly cleaned and disinfected. Place all used disposable items in labeled containers. Place all soiled clothing in marked plastic bags for disposal or washing (Fig. 2-10). Take the following steps to clean up spills:

- Wear disposable gloves and other personal protective equipment when cleaning spills.



Fig. 2-9



Fig. 2-10

- Clean up spills immediately or as soon as possible after the spill occurs.
- If the spill is mixed with sharp objects, such as broken glass and needles, do not pick these up with your hands. Use tongs, a broom and dustpan or two pieces of cardboard.
- Dispose of the absorbent material used to collect the spill in a labeled biohazard container.
- Flood the area with a fresh disinfectant solution of approximately 1½ cups of liquid chlorine bleach to 1 gallon of water (1 part bleach per 10 parts water), and allow it to stand for at least 10 minutes.
- Use appropriate material to absorb the solution, and dispose of it in a labeled biohazard container.
- Scrub soiled boots, leather shoes and other leather goods, such as belts, with soap, a brush and hot water. If you wear a uniform to work, wash and dry it according to the manufacturer's instructions.

IF YOU ARE EXPOSED

Exposure incidents involve contact with blood or other potentially infectious materials through a needlestick, broken or scraped skin or the mucous membranes of the eyes, mouth or nose. Take these steps immediately:

- Wash needlestick injuries, cuts and exposed skin with soap and water.
- Flush splashes of blood or other potentially infectious materials to the mouth and nose with water.
- Irrigate eyes with clean water, saline or sterile irrigants.

Following any exposure incident you should—

- Report the exposure incident to your supervisor immediately. Reporting an exposure incident immediately can be critical to the success of post-exposure treatment.
- Write down what happened.
- Get immediate medical attention. Follow the steps in the exposure control plan for confidential medical evaluation and follow up by a health-care professional.

PUTTING IT ALL TOGETHER

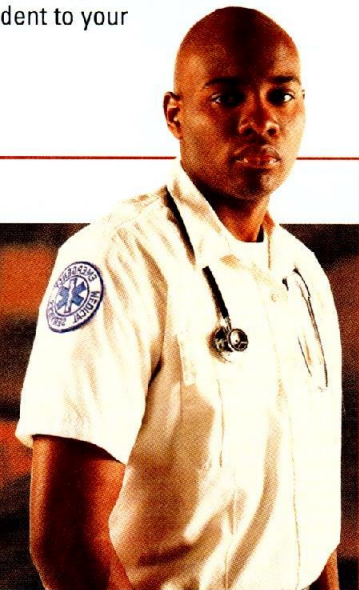
Bloodborne pathogens are bacteria and viruses present in blood and body fluids, which can cause disease in humans. The bloodborne pathogens of primary concern are hepatitis B, hepatitis C and HIV. Bloodborne pathogens such as hepatitis B, hepatitis C and HIV are spread primarily through direct or indirect contact with infected blood or other body fluids.

To prevent the spread of bloodborne pathogens and other diseases, professional rescuers should follow standard precautions. These precautions require that all blood and other potentially infectious materials be treated as if known to be infectious for hepatitis B, hepatitis C, HIV or other bloodborne pathogens. These precautions can be applied by using personal protective equipment, washing your hands frequently, using engineering controls, following work practice controls and following proper equipment cleaning and spill cleanup procedures.

If you become exposed to blood or other potentially infectious materials, you should immediately wash, flush or irrigate the exposed area of your body and report the incident to your supervisor.

REMEMBER:

If you become exposed to blood or other potentially infectious materials, you should immediately wash, flush or irrigate the exposed area of your body and report the incident to your supervisor.

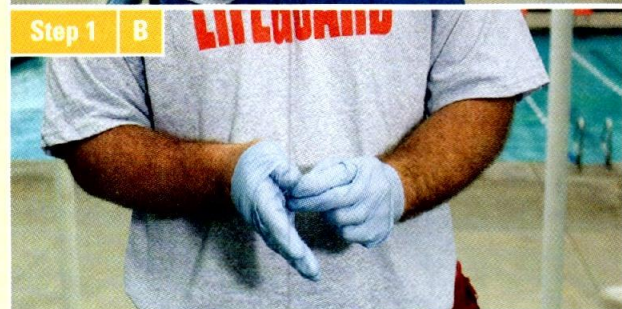


Skill Sheet | Removing Gloves

STEP 1

Partially remove the first glove.

- Pinch the glove at the wrist, being careful to touch only the glove's outside surface (A).
- Pull the glove inside-out toward the fingertips without completely removing it (B).
- The glove is now partly inside out.



STEP 2

Remove the second glove.

- With your partially gloved hand, pinch the outside surface of the second glove.
- Pull the second glove toward the fingertips until it is inside out, and then remove it completely.



STEP 3

Finish removing both gloves.

- Grasp both gloves with your free hand.
- Touch only the clean interior surface of the glove.



STEP 4

After removing both gloves—

- Discard gloves in an appropriate container.
- Wash your hands thoroughly with soap and warm water.

Taking Action and Caring for Breathing Emergencies

WOULD YOU KNOW WHAT TO DO?

While watching a local youth soccer game, you see a young man slowly walking off the field toward you and the bench. It is obvious that he is having difficulty breathing; as he passes you hear a loud wheezing sound with each exhalation, and you notice that with each breath his chest is expanding in an abnormal manner. When he sits down on the bench, you notice that he leans forward and rests his hand on the bench. He appears to be experiencing severe respiratory distress. His eyes are large and he has a frightened look on his face. What would you do in this situation?



As a professional rescuer, you may encounter many emergency situations that require you to act quickly and decisively. In any emergency, first size up the scene, then perform an initial assessment and summon advanced medical personnel if needed.

1. Size up the scene.

- Determine if the scene is safe for you, other rescuers, the victim(s) and any bystanders.
- Look for dangers, such as traffic, unstable structures, downed power lines, swift-moving water, violence, explosions or toxic gas exposure.
- Put on the appropriate personal protective equipment.
- Determine the mechanism of injury or nature of illness. Try to find out what happened and what caused the injury or illness.
- Determine the number of victims.
- Determine what additional help may be needed.

2. Perform an initial assessment.

This is done to identify any life-threatening conditions.

- Check the victim for consciousness and obtain consent if the victim is conscious.
- Check for signs of life (movement and breathing).
- Check for a pulse.
- Check for severe bleeding.

If during the initial assessment you are alone and must leave the victim to summon advanced medical personnel or you find that the victim is moving, breathing and has a pulse but is unconscious, place the victim in a recovery position. This position is used to maintain an open airway for a breathing victim with a decreased level of consciousness (Fig. 3-1). To place the victim in a recovery position, first kneel at the victim's side. Take the arm farthest from you and move it up next to the head and take the other arm and cross it over the chest. Grasp the leg closest to you and bend it up. Then, with your hand on the shoulder and hip, gently roll the body as a unit, keeping the head, neck and back in a straight line. Carefully angle the head toward the ground, allowing fluids to drain away from the throat.

Monitor the airway, breathing and circulation (ABCs). Roll the victim to the opposite side every 30 minutes or if you notice the skin of the lower arm is pale, ashen or

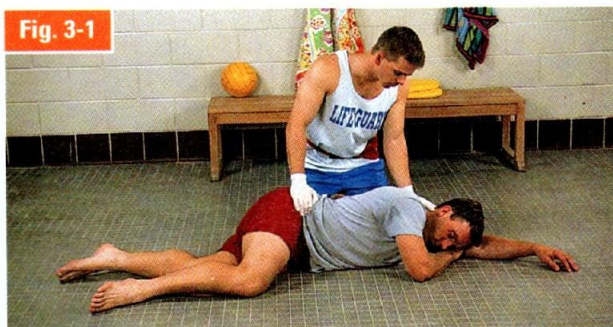


Fig. 3-1

grayish or is cool to the touch. If you suspect a head, neck or back injury and a clear, open airway can be maintained, do not move the victim unnecessarily. If you must leave the victim to get help, or if a clear airway cannot be maintained, move the victim to his or her side while keeping the head, neck and back in a straight line by placing the victim in a modified-high-arm-in-endangered-spine (H.A.I.N.E.S.) position (Fig. 3-2).

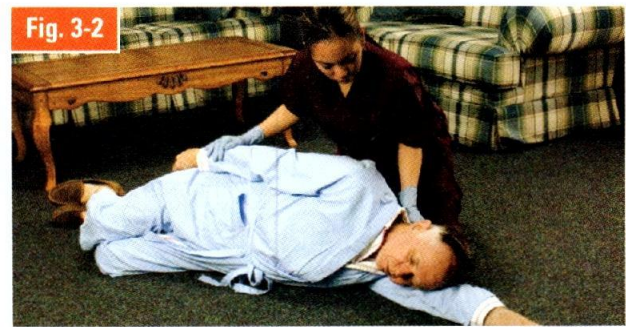


Fig. 3-2

To place a victim in the modified-H.A.I.N.E.S. position, kneel at the victim's side. Reach across the body and lift the far arm up next to the head with the victim's palm facing up. Then take the victim's nearest arm and place it next to his side. Grasp the leg farthest from you and bend it up. Using your hand nearest the victim's head, cup the base of the victim's skull in the palm of your hand and carefully slide your forearm under the victim's near shoulder. Do not lift or push the victim's head or neck. Place your other hand under the arm and hip closest to you. Then, with a smooth motion, roll the victim away from you by lifting with your hand and forearm. The victim's head must remain in contact with his extended arm. Be sure to support the head and neck with your hand. Stop all movement when the victim is on his or her side. Bend the knee closest to you and place it on top of the other knee. Make sure the arm on top is in line with the upper body. Monitor the ABCs and care for the conditions you find.

3. Summon advanced medical personnel. Summon more advanced medical personnel if you find any of the following life-threatening conditions:

- Unconsciousness or disorientation
- Breathing problems (difficulty breathing or no breathing)
- Chest discomfort, pain or pressure lasting more than 3 to 5 minutes or that goes away and comes back
- No pulse
- Severe bleeding
- Persistent abdominal pain or pressure
- Suspected head, neck or back injuries
- Severe allergic reactions
- Stroke (weakness on one side of the face, weakness or numbness in one arm, slurred speech or trouble getting words out)

Call First or Care First?

If you are alone, you will have to decide whether to *Call First* or *Care First*.

Call First means to call for advanced medical personnel before providing care. Always *Call First* if you suspect a cardiac emergency—a situation in which time is critical. Examples include sudden cardiac arrest or the sudden collapse of a child that has been witnessed. In these situations, *Call First*. Next, obtain an automated external defibrillator (AED) if available and then return to the victim to use the AED or begin CPR if an AED is not available. Also, *Call First* for—

- An unconscious adult (12 years or older).
- An unconscious child or infant known to be at high risk for heart problems.

Care First situations are likely to be related to breathing emergencies rather than cardiac emergencies. In these situations, provide support for airway, breathing and circulation through rescue breaths and chest thrusts, as appropriate. *Care First*, that is provide 2 minutes of care, and then summon advanced medical personnel for—

- An unconscious infant or child (younger than 12 years old).
- Any victim of a drowning or nonfatal submersion.
- Any victim who has suffered cardiac arrest associated with trauma.
- Any victim who has taken a drug overdose.

- Seizures that occur in the water
- Seizures that last more than 5 minutes or cause injury
- Repeated seizures (one after another)
- Seizures involving a victim who is pregnant, diabetic or who does not regain consciousness
- Vomiting blood or passing blood
- Severe (critical) burns
- Suspected broken bones
- Suspected poisoning
- Sudden severe headache

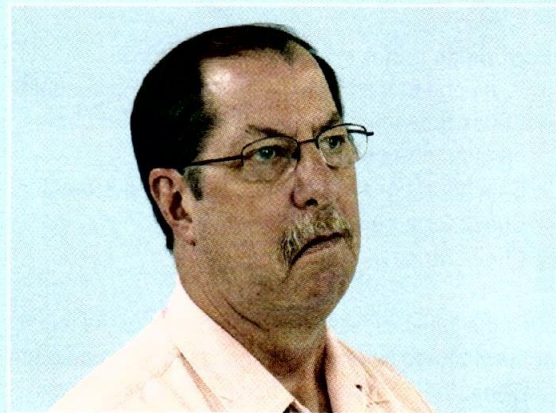
If you are unsure of the victim's condition or notice the condition worsening, call 9-1-1 or the local emergency number.

Stroke

Stroke is the third leading cause of death in the U.S. Successful treatment and recovery depends upon recognizing the signs and symptoms of stroke and summoning advanced medical personnel right away. Look for these signs and symptoms of stroke:

Signs and Symptoms of Stroke, Think F.A.S.T.!

Face—Weakness on one side of the face



Arm—Weakness or numbness in one arm



Speech—Slurred speech or trouble getting words out

Time—Note the time that signs and symptoms were first observed

Adult, Child and Infant: Ages in this Manual

Professional rescuers may have to give care to adults, children and infants. When responding to life-threatening emergencies, the specific care you give may be different depending upon the victim's age. For the purpose of the skills learned in this manual, an adult is considered anyone 12 years old or older. A child is considered 1 to about 12 years of age, and an infant is under 1 year. These age categories are used because the recommendations for care differ according to the victim's size and the cause of the emergency.

These age ranges change when operating an AED. For the purpose of operating an AED, a child is considered 1 to 8 years of age (or less than 55 pounds) and an adult is considered 9 years of age and older.

MOVING A VICTIM

In many cases, you will care for the victim where you find him or her. Do not move the victim unless it is necessary. Moving a victim needlessly can lead to further pain and injury. Move an injured victim only if—

- The scene is unsafe or becoming unsafe (e.g., fire, risk of explosion, a hazardous chemical leak or collapsing structure).
- You have to reach another victim who may have a more serious injury or illness.
- You need to provide proper care (e.g., someone has collapsed on a stairway and needs CPR, which must be performed on a firm, flat surface).

If you must leave a scene to ensure your personal safety, you must make all attempts to move the victim to safety as well. Rescuer safety is of the utmost importance. When moving a victim, a rescuer should consider the following:

- Victim's height and weight
- Physical strength of rescuer
- Obstacles, such as stairs and narrow passages
- Distance to be moved
- Whether others are available to assist
- Victim's condition
- Whether aids to transport are readily available

To improve your chances of successfully moving an injured or ill victim without injuring yourself or the victim—

- Use your legs, not your back, when you bend.
- Bend at the knees and hips and avoid twisting your body.
- Walk forward when possible, taking small steps and looking where you are going.
- Avoid twisting or bending anyone with a possible head, neck or back injury.
- Do not move a victim who is too large to move comfortably.

There are several ways to move a victim from an unsafe scene or to perform proper care. Use any of the following techniques to move a victim if necessary:

Clothes Drag

To move a clothed victim who you think may have a head, neck or back injury—

1. Standing behind the victim's head, gather the victim's clothing behind the victim's neck (**Fig. 3-3**).
2. Pull the victim to safety, cradling the head with the victim's clothes and your hands.

Fig. 3-3

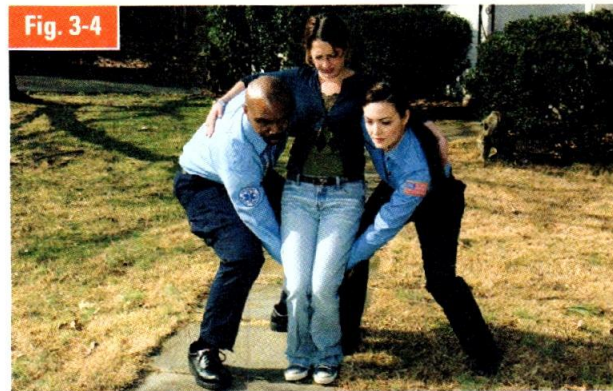


Two-Person Seat Carry

To carry a conscious victim who cannot walk and has no suspected head, neck or back injury—

1. Ask for help from another rescuer or bystander.
2. Put one arm under the victim's thighs and the other across the victim's back.
3. Interlock your arms with those of a second rescuer under the victim's legs and across the victim's back (**Fig. 3-4**).
4. Carry the victim to safety.

Fig. 3-4



Walking Assist

To help a victim who needs assistance walking to safety—

1. Standing at one side of the victim, place the victim's arm across your shoulders and hold onto the victim's forearm.
2. Support the victim's waist with your other hand (Fig. 3-5).
3. Walk the victim to safety. (If the victim begins to fall, this approach will give you more control.)

Fig. 3-5



Pack-Strap Carry

The pack-strap carry can be used with conscious and unconscious victims. Using it with an unconscious victim requires a second responder to help position the injured or ill victim on your back. To move either a conscious or unconscious victim with no suspected head, neck or back injury—

1. Have the victim stand or have a second responder support the victim.
2. Position yourself with your back to the victim. Keep your back straight and knees bent, so that your shoulders fit into the victim's armpits.
3. Cross the victim's arms in front of you and grasp the victim's wrists.
4. Lean forward slightly and pull the victim up and onto your back.
5. Stand up and walk to safety. Depending on the size of the victim, you may be able to hold both of his or her wrists with one hand, leaving your other hand free to help maintain balance, open doors and remove obstructions (Fig. 3-6).

Blanket Drag

To move an unconscious victim in an emergency situation when equipment is limited—

1. Keep the victim between you and the blanket.
2. Gather half of the blanket and place it against the victim's side.



Fig. 3-6

3. Roll the victim as a unit toward you.
4. Reach over and place the blanket so that it will be positioned under the victim.
5. Roll the victim onto the blanket.
6. Gather the blanket at the head and drag the victim (Fig. 3-7).

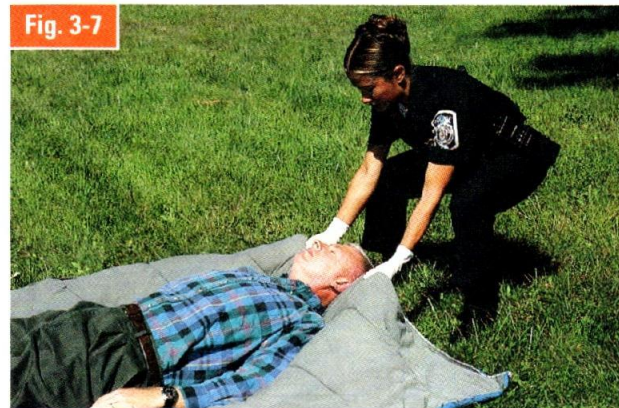


Fig. 3-7

Foot Drag

To move a victim too large to carry or move otherwise—

1. Stand at the victim's feet and firmly grasp the victim's ankles and move backward (Fig. 3-8).
2. Pull the victim in a straight line, and be careful not to bump the victim's head.

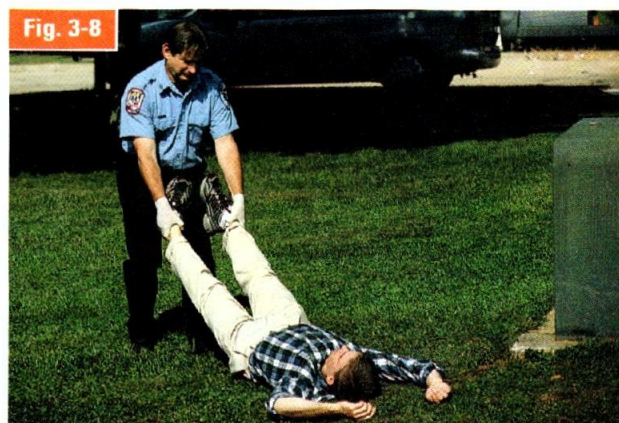


Fig. 3-8

Epinephrine Administration

Approximately 2 million people in the United States are at risk for anaphylaxis, and each year 400 to 800 people die from anaphylactic reactions. Insect stings; penicillin; aspirin; food additives, such as sulfites; and certain foods, such as shellfish, fish and nuts, can trigger anaphylaxis in susceptible people. These reactions may be life threatening and require immediate care. An ID bracelet should be worn by anyone at risk. Some possible signs and symptoms in anaphylactic victims include—

- Swelling of the face, neck, hands, throat, tongue or other body part.
- Itching of tongue, armpits, groin or any body part.
- Dizziness.
- Redness or welts on the skin.
- Red watery eyes.
- Nausea, abdominal pain or vomiting.
- Rapid heart rate.
- Difficulty breathing or swallowing.
- Feeling of constriction in the throat or chest.

Epinephrine is a medication prescribed to treat the signs and symptoms of these reactions. If someone shows any of these signs or symptoms, summon more advanced medical personnel immediately.

Note: Rescuers should follow local protocols or medical directives when applicable.

Use an epinephrine auto-injector when a victim—

- Relates a history of allergies or allergic reactions.
- Is having an allergic reaction.
- Requests assistance to administer epinephrine.
- Provides the epinephrine or auto-injector.
- Has a family member who relates a victim's history of allergies or allergic reactions and provides the victim's auto-injector.

Before assisting or administering epinephrine to the victim—

- Summon more advanced medical personnel.
- Check the label to ensure that the prescription is for the victim.
- Ensure that the person has not already taken epinephrine or antihistamine. If so, do not administer another dose unless directed by emergency medical services (EMS) personnel.
- Ensure that the prescription has not expired.
- Ensure that the medication is clear and not cloudy or discolored.
- Read and follow instructions provided with the auto-injector.

An epinephrine auto-injector is simple and easy to use. However, it needs to be accessed quickly. Assisting the victim with the medication can include getting the pen from a purse, car, home or out of a specially designed carrier on a belt. It may also include taking it out of the plastic tube or assisting the victim with the injection into the thigh.

The standard epinephrine dose is 0.3 mg for an adult or 0.15 mg for a child weighing less than 45 pounds. To administer an intramuscular injection—

1. Locate the middle of the outer thigh or the upper arm to use as the injection site.



Photo courtesy of Dey, L. P.

2. Grasp the auto-injector firmly and remove the safety cap.
3. Hold the auto-injector at a 90-degree angle to the victim's outer thigh.

Continued

4. Firmly jab the tip straight into the thigh. You will hear a click. Hold the auto-injector firmly in place for 10 seconds.



5. Remove it from the thigh and massage the injection site for several seconds.



Continue to check ABCs. Give used auto-injector to EMS personnel.

In all cases of epinephrine administration, follow-up care and transport to a medical facility is needed. The beneficial effect of epinephrine is relatively short in duration. Someone having a severe allergic reaction may require additional medications that can be administered only in a hospital.

BREATHING EMERGENCIES

You may detect a breathing emergency during the initial assessment. A breathing emergency occurs if a victim has difficulty breathing (respiratory distress) or stops breathing (respiratory failure/arrest). Without adequate oxygen, *hypoxia* will result. Hypoxia is a condition in which insufficient oxygen reaches the cells. Signs and symptoms of hypoxia include increased breathing and heart rates, *cyanosis* (a condition that develops when tissues do not get enough oxygen and turn blue, particularly in the lips and nail beds), changes in level of consciousness, restlessness and chest pain. Breathing emergencies can be caused by—

- Obstructed airway (choking).
- Injury to the head, chest, lungs or abdomen.
- Illness, such as pneumonia.
- Respiratory conditions, such as emphysema or asthma.
- Heart attack.
- Coronary heart disease (such as angina).
- Allergic reactions (food or insect stings).
- Electrocution.
- Shock.
- Drowning.
- Nonfatal submersion injury.
- Poisoning.
- Drugs.
- Emotional distress.

Respiratory Distress

A victim who is having difficulty breathing is in respiratory distress. Signs and symptoms of respiratory distress include—

- Slow or rapid breathing.
- Unusually deep or shallow breathing.
- Shortness of breath or noisy breathing.
- Dizziness, drowsiness or light-headedness.
- Changes in the level of consciousness.
- Increased heart rate.
- Chest pain or discomfort.
- Skin that is flushed, pale, ashen or bluish.
- Unusually moist or cool skin.
- Gasping for breath.
- Wheezing, gurgling or making high-pitched noises.
- Inability to speak in full sentences.
- Tingling in the hands or feet.

Injuries and other conditions such as asthma, emphysema and anaphylactic shock can cause respiratory distress.

Asthma is a condition that narrows the air passages and makes breathing difficult. During an asthma attack, the air passages become constricted by a spasm of the muscles lining the bronchi or by swelling of the bronchi themselves. Asthma may be triggered by an allergic reaction, emotional stress or physical activity. A character-

istic sign of asthma is wheezing when exhaling.

Emphysema is a disease in which the lungs lose their ability to exchange carbon dioxide and oxygen efficiently, causing a shortness of breath.

Anaphylactic shock, also known as *anaphylaxis*, is a severe allergic reaction. The air passages may swell and restrict breathing. Anaphylaxis may be caused by insect bites or stings, foods, chemicals, medications or latex allergies. Anaphylactic shock is a life-threatening condition.

Caring for Respiratory Distress

You do not need to know the cause of respiratory distress to provide care. Whenever you find a victim experiencing difficulty breathing—

- Summon advanced medical personnel.
- Help the victim rest in a comfortable position that makes breathing easier.
- Reassure and comfort the victim.
- Assist the victim with any of his or her prescribed medication.
- Keep the victim from getting chilled or overheated.
- Give emergency oxygen, if it is available and you are trained to do so.

Someone with asthma or emphysema who is in respiratory distress may try to do pursed-lip breathing. Have the person assume a position of comfort. After he or she inhales, have the person slowly exhale out through the lips, pursed as though blowing out candles. This creates back pressure, which can help open airways slightly until advanced medical personnel arrive.

Respiratory Arrest

A victim who has stopped breathing is in respiratory arrest or failure. Respiratory arrest may develop from respiratory distress or may occur suddenly as a result of an obstructed airway, heart attack or other cause. If an unconscious victim has a pulse, but is not moving or breathing normally, he or she needs rescue breathing. When checking an unconscious victim you may detect an irregular, gasping or shallow breath. This is known as an *agonal breath*. Do not confuse this with normal breathing. Look for movement and check for breathing and a pulse during the initial assessment. If the person has a pulse but is not moving or breathing normally, begin rescue breathing.

RESCUE BREATHING

Rescue breathing is a technique for breathing air into a victim to give him or her oxygen needed to survive. The air you exhale contains enough oxygen to keep a person alive. When giving rescue breaths, take a normal breath and breathe into the mask. Each breath should last about 1 second and make the chest clearly rise. Give 1 breath

every 5 seconds for an adult. Give 1 breath every 3 seconds for a child or infant.

Continue rescue breathing until—

- The victim begins to breathe on his or her own.
- Another trained rescuer takes over for you.
- You are too exhausted to continue.
- The victim has no pulse, in which case you should begin CPR or use an AED if one becomes immediately available.
- The scene becomes unsafe.

Breathing Barriers

Breathing barriers include resuscitation masks, face shields and bag-valve-mask resuscitators (BVMs). Breathing barriers help protect you against disease transmission when giving rescue breaths. As a professional rescuer, a resuscitation mask with a one-way valve or BVM should be available in your response gear.

Resuscitation Masks

Resuscitation masks are flexible, dome-shaped devices that cover a victim's mouth and nose and allow you to breathe air into a victim without making mouth-to-mouth contact. Most employers provide resuscitation masks for professional rescuers. Resuscitation masks have several benefits. They—

- Supply air to the victim more quickly through both the mouth and nose.
- Create a seal over the victim's mouth and nose.
- Can be connected to emergency oxygen if they have an oxygen inlet.
- Protect against disease transmission when giving rescue breaths.

A resuscitation mask should have the following characteristics (Fig. 3-9):

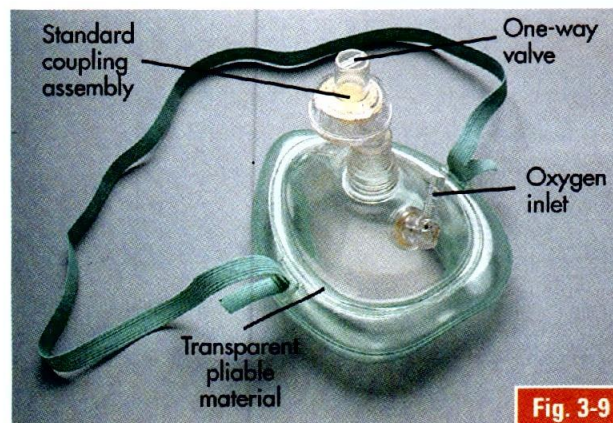


Fig. 3-9

- Be easy to assemble and use
- Be made of transparent, pliable material that allows you to make a tight seal over the victim's mouth and nose
- Have a one-way valve for releasing exhaled air

- Have a standard 15-mm or 22-mm coupling assembly (the size of the opening for the one-way valve)
- Have an inlet for delivering emergency oxygen
- Work well under different environmental conditions, such as extreme heat or cold

Child and infant resuscitation masks are available and should be used to care for children and infants (**Fig. 3-10**). If a pediatric resuscitation mask is not available, an adult mask can be used instead by placing the narrow end of the mask over the mouth. You do not need to rotate all resuscitation masks to create an adequate seal. For additional information on how to use a resuscitation mask, refer to Using a Resuscitation Mask for Rescue Breathing Skill Sheet, pages 78-80.



Face Shields

One of the most compact and easy-to-use breathing devices is a face shield (**Fig. 3-11**). A face shield is a small sheet of plastic with a filter or one-way valve in the middle. It is placed over a victim's face with the one-way valve covering the mouth. This allows you to give rescue breaths to a victim while reducing the risk of disease transmission during rescue breathing. A major limitation of face shields for professional rescuers is that they cannot be used with emergency oxygen like resuscitation masks and BVMs.



BVMs

A BVM is a hand-held device used primarily to ventilate a victim in respiratory arrest (**Fig. 3-12**). It can also be used for a victim in respiratory distress. Because it is necessary to maintain a tight seal on the mask, two rescuers

should operate a BVM (one rescuer positions and seals the mask, while the second rescuer squeezes the bag).



- BVMs have several advantages. They—
- Increase oxygen levels in the blood by using the air in the surrounding environment instead of the air exhaled by the rescuer.
 - Can be connected with emergency oxygen.
 - Are more effective for delivering ventilations when used correctly by two rescuers.
 - Protect against disease transmission.

BVMs come in various sizes. Pediatric BVMs are available for children and infants. Facilities must have BVMs for adults, children and infants in order to be appropriately prepared. If a pediatric BVM is not available, an adult mask can be used by placing the narrow end of the mask over the mouth and making sure not to use as much force when squeezing the bag. Using an adult BVM on an infant has the potential for harm and should only be used in an emergency situation when pediatric BVMs are not available.

For additional information on how to use a BVM, refer to Using a Bag-Valve-Mask Resuscitator—Two Rescuers Skill Sheet, pages 34-35.

Rescue Breathing—Special Situations

Suspected Head, Neck or Back Injury

Suspect a head or neck injury if the victim—

- Was involved in a motor vehicle, motorized cycle or bicycle crash as an occupant, rider or pedestrian.
- Was injured as a result of a fall from greater than a standing height.
- Complains of neck or back pain, tingling in the extremities or weakness.
- Is not fully alert.
- Appears to be intoxicated.
- Appears frail or over 65 years of age.
- Has a head or neck injury.

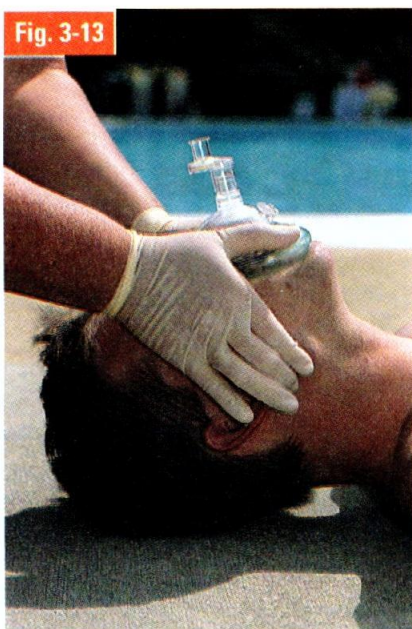
Check for the following signs and symptoms of a possible head, neck or back injury before you attempt to provide care:

- Changes in the level of consciousness
- Severe pain or pressure in the head, neck or back

- Loss of balance
- Partial or complete loss of movement of any body part
- Tingling or loss of sensation in the hands, fingers, feet or toes
- Persistent headache
- Unusual bumps, bruises or depressions on the head, neck or back
- Seizures
- Blood or other fluids in the ears or nose
- Heavy external bleeding of the head, neck or back
- Impaired breathing or vision as a result of injury
- Nausea or vomiting
- Bruising of the head, especially around the eyes and behind the ears

If you suspect an unconscious victim has a head, neck or back injury, remember the priority of care. Airway and breathing take precedence over spinal movement. Try to open the airway by lifting the chin without tilting the head, using the jaw-thrust maneuver (Fig. 3-13):

1. Position the mask.
2. Place your thumbs along each side of the resuscitation mask.
3. Brace your elbows for support.
4. Slide your fingers into position under the angles of the victim's jawbone.
5. Without moving the victim's head, apply downward pressure with your thumbs to seal the mask and lift the jaw to open the airway.
6. Give rescue breaths.



If the jaw-thrust maneuver does not open the airway, use the head-tilt/chin-lift technique to open the airway.

Air in the Stomach

When giving rescue breaths, breathe slowly, just enough to make the victim's chest clearly rise. If you breathe too much air into the victim, it will enter the stomach, causing gastric distention. The victim will then likely vomit, which can obstruct the airway and complicate resuscitation efforts.

Vomiting and Drowning

When you give rescue breaths to a victim of a nonfatal submersion injury, the victim will likely vomit. If this occurs, quickly turn the victim onto his or her side. Support the head and neck and turn the body as a unit (Fig. 3-14). Turning the victim onto his or her side keeps vomit from blocking the airway and entering the lungs. After vomiting stops, quickly wipe the victim's mouth clean. Then turn the victim on his or her back, and continue with rescue breathing.



People with Dentures

If the victim is wearing dentures, leave them in place unless they become loose and block the airway. Dentures help support the victim's mouth and cheeks, making it easier to seal the resuscitation mask during rescue breathing.

Mask-to-Nose Breathing

If the victim's mouth is injured, you may need to give rescue breathing through the nose. To perform mask-to-nose breathing—

- Use a resuscitation mask.
- Maintain the head-tilt position.
- Place the resuscitation mask over the victim's mouth and nose.
- Use both hands to close the victim's mouth.
- Seal the resuscitation mask with both hands.
- Give breaths.

Mask-to-Stoma Breathing

On rare occasions, you may see an opening in a victim's neck as you tilt the head back to check for breathing. This victim may have had an operation to remove part of the windpipe. If so, the victim breathes through this opening, which is called a *stoma*. If a victim with a stoma needs rescue breathing, follow the same steps for mouth-to-mask breathing, except—

- Look, listen and feel for breathing with your ear over the stoma.
- Maintain the airway in a neutral position. (This ensures the victim's airway is neither flexed nor extended, as the stoma provides access to the lower airway.)
- Use a child or infant resuscitation mask over the victim's stoma.
- If possible, pinch the nose and close the mouth, as some victims with a stoma may still have a passage for air that reaches the mouth and nose in addition to the stoma.
- Give rescue breaths.

AIRWAY OBSTRUCTION

An airway obstruction is the most common cause of respiratory emergencies. A victim whose airway is blocked can quickly stop breathing, lose consciousness and die. There are two types of airway obstructions: anatomical and mechanical. An *anatomical obstruction* occurs when the airway is blocked by an anatomical structure, such as the tongue or swollen tissues of the mouth and throat. In an unconscious victim, the tongue is a common cause of airway obstruction. This occurs because the tongue relaxes when the body is deprived of oxygen. As a result, the tongue rests on the back of the throat, inhibiting the flow of air to the lungs. A *mechanical obstruction* occurs when foreign objects, such as a piece of food or a small toy, or fluids, such as vomit, blood, mucus or saliva, block the airway. A conscious victim who is clutching his or her throat with one or both hands is usually choking. This is considered the universal sign of choking. Common causes of choking include—

- Poorly chewed food.
- Drinking alcohol before or during meals. (Alcohol dulls the nerves that aid swallowing, making choking on food more likely.)
- Eating too fast or talking or laughing while eating.

An airway obstruction is the most common cause of respiratory emergencies.

- Walking, playing or running with food or objects in the mouth.
- Wearing dentures. (Dentures make it difficult to sense whether food is fully chewed before it is swallowed.)

Caring for Airway Obstructions

Professional rescuers must be able to recognize when a victim is choking. The airway may be partially or completely obstructed. A victim who is clutching his or her throat with one or both hands is usually choking. Someone with a partial airway obstruction can still move some air to and from the lungs and may make wheezing sounds. Someone with a complete airway obstruction cannot cough, speak or breathe. Get consent before helping a conscious choking victim. If the choking victim is unconscious, consent is implied.

Conscious Choking Adult and Child

When caring for a conscious choking adult or child, perform a combination of 5 back blows followed by 5 abdominal thrusts. Each back blow and abdominal thrust should be a distinct attempt to dislodge the object. Use less force when giving back blows and abdominal thrusts to a child. Using too much force may cause internal injuries. Continue back blows and abdominal thrusts until the object is dislodged and the victim can breathe or cough forcefully, or becomes unconscious. For additional information on how to care for a conscious choking adult or child, refer to Conscious Choking—Adult and Child Skill Sheet, pages 36-37.

Conscious Choking Infant

When caring for a conscious choking infant, use a combination of 5 back blows and 5 chest thrusts. Continue back blows and chest thrusts until the object is dislodged and the infant can breathe or cough forcefully, or becomes unconscious. For additional information on how to care for a conscious choking infant, refer to Conscious Choking—Infant Skill Sheet, pages 38-39.

Special Considerations for Choking Victims

In some situations, abdominal thrusts may not be an effective method of care for conscious choking victims. If you cannot reach far enough around the victim to give effective abdominal thrusts or if the victim is obviously pregnant or known to be pregnant, you should give 5 back blows followed by 5 chest thrusts.

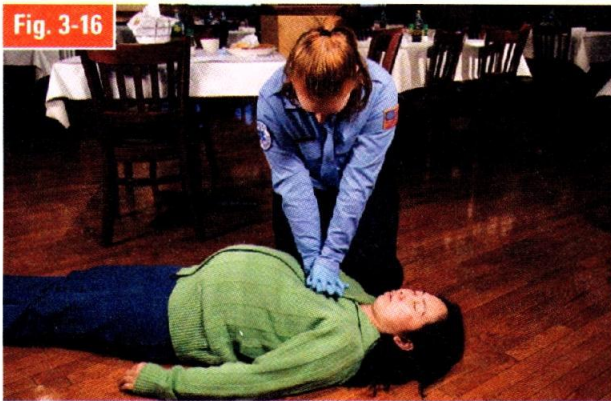
To perform chest thrusts—

- Stand behind the victim.
- Make a fist with one hand and place the thumb side against the center of the victim's chest. If the victim is obviously pregnant or known to be pregnant, position your hands slightly higher on the victim's chest.

- Grab your fist with your other hand and give quick, inward thrusts (Fig. 3-15). Look over the victim's shoulder so that his or her head does not hit your face when you perform the chest thrusts.



- Repeat the back blows and chest thrusts until the object is forced out, the victim begins to breathe or cough forcefully on his or her own or the victim becomes unconscious (Fig. 3-16).



Unconscious Choking Adult and Child

If you give an unconscious adult rescue breaths and they do not make the chest clearly rise, reposition the airway by tilting the head farther back and then try the breaths again. For an unconscious child, if you give rescue breaths and they do not make the chest clearly rise, reposition the airway by retilting the child's head and attempting the rescue breaths again.

If the rescue breaths still do not make the chest clearly rise, position yourself to give 5 chest thrusts. For an adult or child, use two hands in the center of the chest. Compress an adult's chest to a depth of about $1\frac{1}{2}$ to 2 inches. Compress a child's chest to a depth of about 1 to

$1\frac{1}{2}$ inches. Then, look for an object. If you see an object, sweep it out with your index finger (for a child, use your little finger). Try 2 rescue breaths again. Repeat cycles of chest thrusts, foreign object check/removal and rescue breaths until the chest clearly rises. If the chest clearly rises, look for movement and check for breathing and a pulse for no more than 10 seconds. Provide care based on the conditions found. For additional information on how to care for an unconscious choking adult or child, refer to Unconscious Choking—Adult and Child Skill Sheet, pages 40-42.

Unconscious Choking Infant

If you give rescue breaths to an unconscious infant and the breaths do not make the chest clearly rise, reposition the airway by retilting the infant's head and attempt the rescue breaths again. If the rescue breaths still do not make the chest clearly rise, carefully position the infant and give 5 chest thrusts. To give chest thrusts, put 2 or 3 fingers on the center of the infant's chest just below the nipple line. Compress the chest about $\frac{1}{2}$ to 1 inch. Then open the infant's mouth and look for an object. If you see an object, sweep it out using your little finger. Try 2 rescue breaths again. Repeat cycles of chest thrusts, foreign object check/removal and rescue breaths until the chest clearly rises. If the chest clearly rises, look for movement and check for breathing and a pulse for no more than 10 seconds. Provide care based on the conditions found. For additional information on how to care for an unconscious choking infant, refer to Unconscious Choking—Infant Skill Sheet, pages 43-44.

PUTTING IT ALL TOGETHER

When responding to an emergency, size up the scene, perform an initial assessment and summon advanced medical personnel if needed. In some cases, you may need to move a victim in order to care for him or her. Move a victim if the scene is unsafe or becoming unsafe, you have to reach a victim with a more serious injury or you need to move the victim in order to give proper care. As a professional rescuer, you should recognize the signs and symptoms of respiratory distress and respiratory arrest. You also need to know how to give rescue breaths to a victim who has a pulse, but is not moving or breathing normally, and how to care for a conscious or unconscious victim who is choking.

Skill Sheet | Initial Assessment

Remember: Always size up the scene before the initial assessment. Determine the scene safety, mechanism of injury and number of victims. Put on the appropriate personal protective equipment and call for additional help if necessary.

STEP 1

Tap the victim's shoulder and shout, "Are you okay?" (A)

- For an infant, gently tap the shoulder or flick the foot (B).



STEP 2

If no response, summon advanced medical personnel.

Note: If the victim is face-down, roll the victim onto his or her back, while supporting the head and neck.

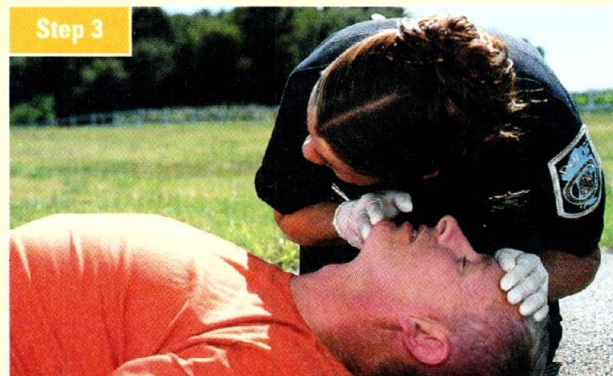
STEP 3

Check for signs of life (movement and normal breathing).

- Tilt the head back and lift the chin to open the airway.
- Look for movement and look, listen and feel for normal breathing for no more than 10 seconds.

Note:

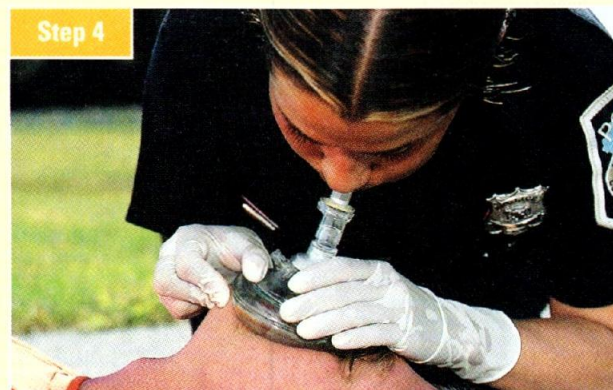
- **Irregular, gasping or shallow breathing is not normal breathing.**
- **Do not tilt a child or infant's head back as far as an adult's. Tilt an infant's head to the neutral position and a child's head slightly past the neutral position.**
- **If you suspect a head, neck or back injury, try the jaw-thrust maneuver to open the airway (see p. 25).**

**STEP 4**

If there is no movement or breathing, give 2 rescue breaths.

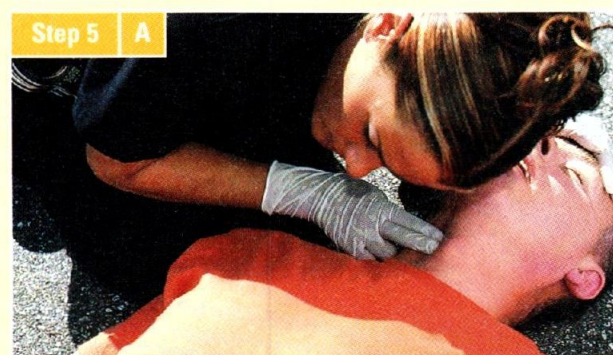
- Assemble and position the resuscitation mask.
- Tilt the head back and lift the chin to open the airway.
- Each breath should last about 1 second and make the chest clearly rise.

Note: Use a pediatric resuscitation mask for a child or infant, if available.

**STEP 5**

If the chest clearly rises, check for a pulse for no more than 10 seconds.

- For a hypothermia victim, check for a pulse for up to 30 to 45 seconds
- **Adult and Child:** Feel for a pulse at the carotid artery. With one hand on the victim's forehead, place 2 fingers on the front of the neck. Slide your fingers toward you and down into the groove at the side of the neck (A).



Continued

Skill Sheet | Initial Assessment—cont'd

- **Infant:** With one hand on the infant's forehead, find the brachial pulse on the inside of the upper arm, between the infant's elbow and shoulder (B).



STEP 6

Quickly scan the victim for severe bleeding.



What to Do—

If there is movement, breathing and a pulse—

- Place the victim in a recovery position (or modified-H.A.I.N.E.S. position if spinal injury is suspected) and continue to monitor the ABCs.
- Administer emergency oxygen, if available and you are trained to do so.

If your first 2 rescue breaths do not make the chest clearly rise, go to—

- Unconscious Choking—Adult and Child Skill Sheet, pages 40-42.
- Unconscious Choking—Infant Skill Sheet, pages 43-44.

If there is a pulse, but no movement or breathing—

Give rescue breathing, go to—

- Rescue Breathing—Adult Skill Sheet, page 31.
- Rescue Breathing—Child Skill Sheet, page 32.
- Rescue Breathing—Infant Skill Sheet, page 33.
- Using a Bag-Valve-Mask Resuscitator—Two Rescuers Skill Sheet, pages 34-35.

If there is no movement, breathing or pulse—

Perform CPR, go to—

- CPR—Adult and Child Skill Sheet, pages 52-53.
- CPR—Infant Skill Sheet, pages 54-55.
- Two-Rescuer CPR—Adult and Child Skill Sheet, pages 56-57.
- Two-Rescuer CPR—Infant Skill Sheet, pages 58-60.

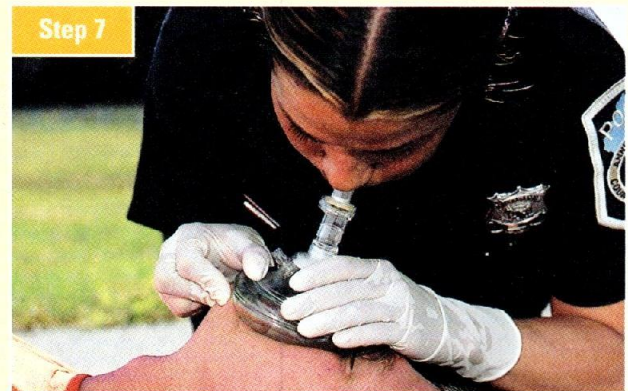
Skill Sheet | Rescue Breathing—Adult

Complete Steps 1-6, Initial Assessment Skill Sheet, pages 28-30.

STEP 7

If there is a pulse, but no movement or breathing, give 1 rescue breath about every 5 seconds.

- Position the resuscitation mask.
- Tilt the head back and lift the chin to open the airway.
- Breathe into the mask.
- Each rescue breath should last about 1 second and make the chest clearly rise.



STEP 8

Continue to give 1 rescue breath about every 5 seconds.

- Watch the chest clearly rise when giving each rescue breath.
- Do this for about 2 minutes.

STEP 9

Remove the resuscitation mask, look for movement and recheck for breathing and a pulse for no more than 10 seconds.

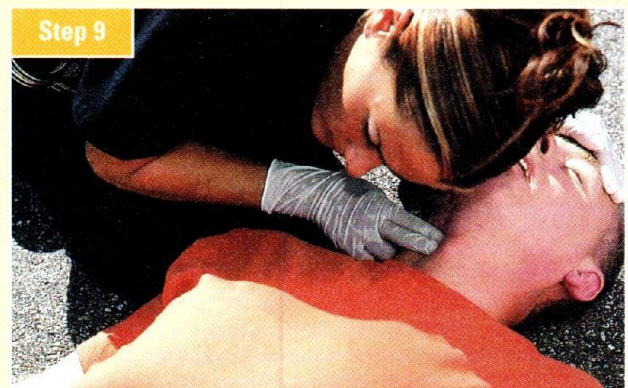
What to Do—

If there is a pulse, but still no movement or breathing—

- Replace the mask and continue rescue breathing.
- Look for movement and recheck for breathing and a pulse about every 2 minutes.

If there is movement, breathing and a pulse—

- Place the victim in a recovery position (or modified-H.A.I.N.E.S. position if spinal injury is suspected) and continue to monitor the ABCs.
- Administer emergency oxygen, if available and you are trained to do so.



If there is no movement, breathing or pulse—

Perform CPR, go to—

- CPR—Adult and Child Skill Sheet, pages 52-53.
- Two-Rescuer CPR—Adult and Child Skill Sheet, pages 56-57.

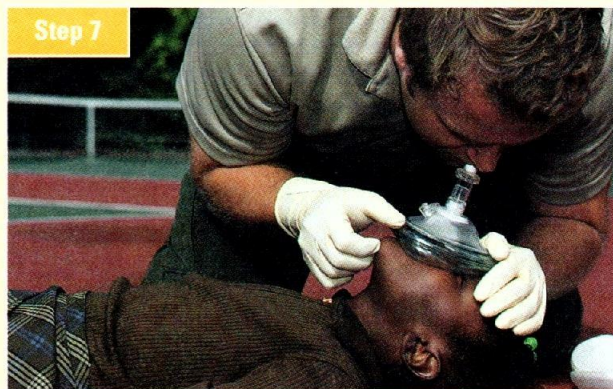
Skill Sheet | Rescue Breathing—Child

Complete Steps 1-6, Initial Assessment Skill Sheet, pages 28-30.

STEP 7

If there is a pulse, but no movement or breathing, give 1 rescue breath about every 3 seconds.

- Position the resuscitation mask.
- Tilt the head slightly past neutral and lift the chin to open the airway.
- Breathe into the mask.
- Each rescue breath should last about 1 second and make the chest clearly rise.



STEP 8

Continue to give 1 rescue breath about every 3 seconds.

- Watch the chest clearly rise when giving each rescue breath.
- Do this for about 2 minutes.

STEP 9

Remove the resuscitation mask, look for movement and recheck for breathing and a pulse for no more than 10 seconds.



What to Do—

If there is a pulse, but still no movement or breathing—

- Replace the mask and continue rescue breathing.
- Look for movement and recheck for breathing and a pulse about every 2 minutes.

If there is movement, breathing and a pulse—

- Place the victim in a recovery position (or modified-H.A.IN.E.S. position if spinal injury is suspected) and continue to monitor the ABCs.
- Administer emergency oxygen, if available and you are trained to do so.

If there is no movement, breathing or pulse—

Perform CPR, go to:

- CPR—Adult and Child Skill Sheet, pages 52-53.
- Two-Rescuer CPR—Adult and Child Skill Sheet, pages 56-57.

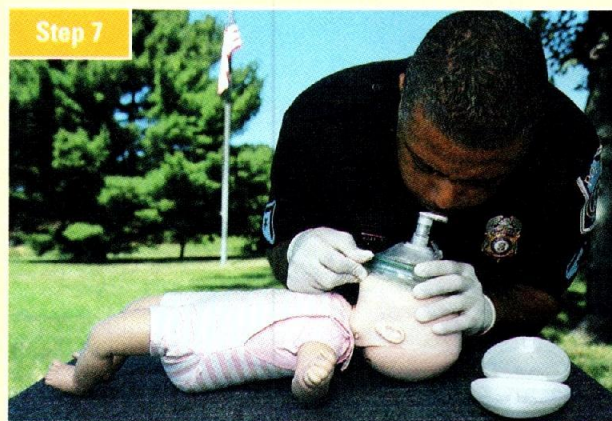
Skill Sheet | Rescue Breathing—Infant

Complete Steps 1-6, Initial Assessment Skill Sheet, pages 28-30.

STEP 7

If there is a pulse, but no movement or breathing, give 1 rescue breath about every 3 seconds.

- Position the resuscitation mask.
- Tilt the head to a neutral position and lift the chin to open the airway.
- Breathe into the mask.
- Each rescue breath should last about 1 second and make the chest clearly rise.



STEP 8

Continue to give 1 rescue breath about every 3 seconds.

- Watch the chest clearly rise when giving each rescue breath.
- Do this for about 2 minutes.

STEP 9

Remove the resuscitation mask, look for movement and recheck for breathing and a pulse for no more than 10 seconds.

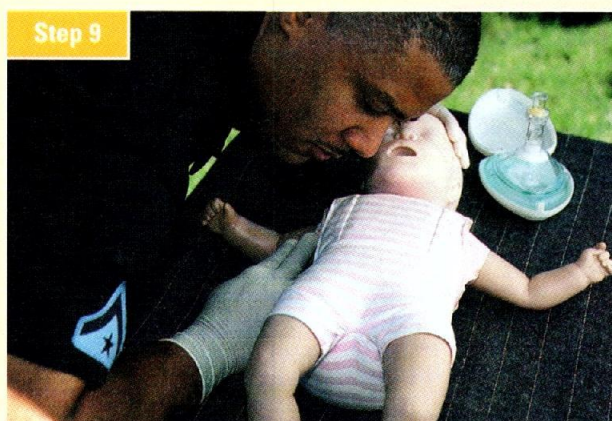
What to Do—

If there is a pulse, but still no movement or breathing—

- Replace the mask and continue rescue breathing.
- Look for movement and recheck for breathing and a pulse about every 2 minutes.

If there is movement, breathing and a pulse—

- Maintain an open airway and continue to monitor the ABCs.
- Administer emergency oxygen, if available and you are trained to do so.



If there is no movement, breathing or pulse—

Perform CPR, go to—

- CPR—Infant Skill Sheet, pages 54-55.
- Two-Rescuer CPR—Infant Skill Sheet, pages 58-60.

Skill Sheet | Using a Bag-Valve-Mask Resuscitator— Two Rescuers

Remember: Rescuer 1 performs the Initial Assessment Skill Sheet Steps 1-6 and Rescuer 2 arrives and assists.

STEP 7

Rescuer 2 arrives and assembles the bag-valve-mask resuscitator (BVM).

✓ **PROFESSIONAL RESCUER TIP:**
Use pediatric BVMs for children and infants.



STEP 8

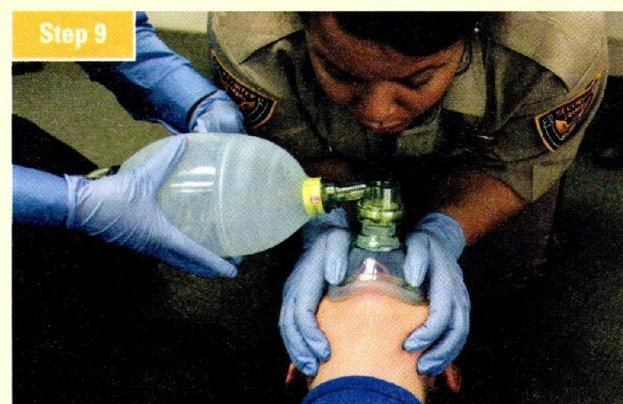
Rescuer 1 kneels behind the victim's head and puts the mask over the victim's mouth and nose.



STEP 9

Rescuer 1 seals the mask and opens the airway.

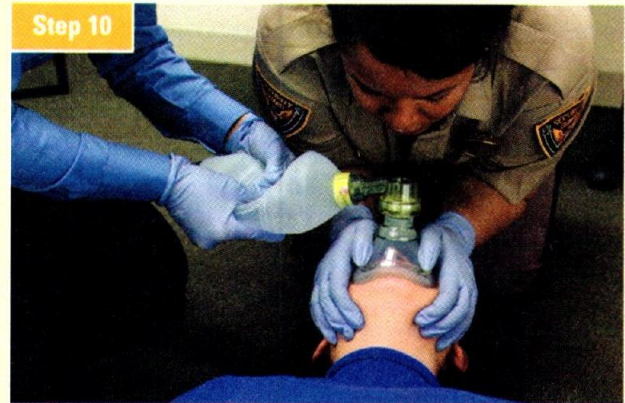
- Kneel behind the victim's head.
- Place your thumbs along each side of the mask.
- Slide your fingers behind the angles of the jawbone.
- Push down on the mask with your thumbs, lift the jaw and tilt the head back.



STEP 10

Rescuer 2 begins ventilations.

- Squeeze the bag slowly for about 1 second using just enough force to make the chest clearly rise with each ventilation.
- Give 1 ventilation about every 5 seconds for an adult and 1 ventilation about every 3 seconds for a child or infant.
- Do this for about 2 minutes.

**STEP 11**

Remove the BVM, look for movement and recheck for breathing and a pulse for no more than 10 seconds.

What to Do—**If there is a pulse, but still no movement or breathing—**

- Replace the BVM and continue ventilations.
- Continue to look for movement and recheck for breathing and a pulse about every 2 minutes.

If there is movement, breathing and a pulse—

- Place the victim in a recovery position (or modified-H.A.I.N.E.S. position if spinal injury is suspected) and continue to monitor the ABCs.
- Administer emergency oxygen, if available and you are trained to do so.

If there is no movement, breathing or pulse—

Perform CPR, go to—

- CPR—Adult and Child Skill Sheet, pages 52-53.
- CPR—Infant Skill Sheet, pages 54-55.
- Two-Rescuer CPR—Adult and Child Skill Sheet, pages 56-57.
- Two-Rescuer CPR—Infant Skill Sheet, pages 58-60.

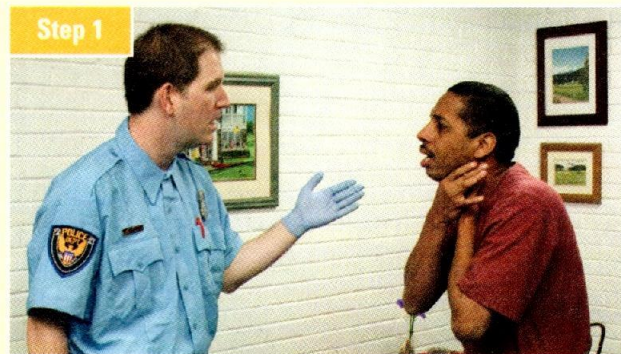
Skill Sheet | Conscious Choking—Adult and Child

Remember: *If a parent or guardian is present, obtain consent before caring for a conscious choking child. Tell the child's parent or guardian your level of training and the care you are going to provide. If the parent or guardian is not available, consent is implied.*

STEP 1

Ask the victim "Are you choking?"

- Identify yourself and ask if you can help.
- If the victim is coughing forcefully, encourage continued coughing.



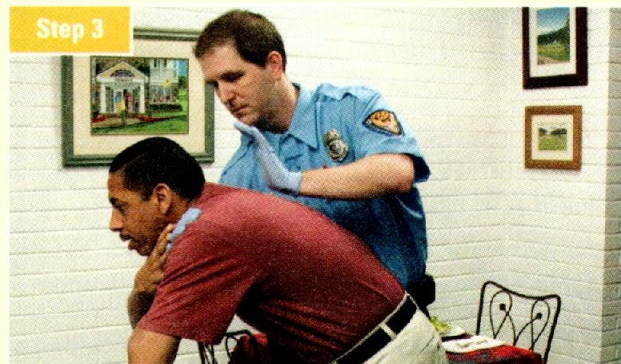
STEP 2

If the victim cannot cough, speak or breathe, have someone else summon advanced medical personnel.

STEP 3

Lean the victim forward and give 5 back blows with the heel of your hand.

- Position yourself slightly behind the victim.
- Provide support by placing one arm diagonally across the chest and lean the victim forward.
- Firmly strike the victim between the shoulder blades with the heel of your hand.
- Each blow is a distinct attempt to dislodge the object.



STEP 4

Give 5 abdominal thrusts.

- **Adult:** Stand behind the victim.
- **Child:** Stand or kneel behind the child depending on the child's size. Use less force on a child than you would on an adult (A).
- Use one hand to find the navel.
- Make a fist with your other hand and place the thumb side of your fist against the middle of the victim's abdomen, just above the navel (B).
- Grab the fist with your other hand.
- Give quick, upward thrusts. Each thrust should be a distinct attempt to dislodge the object (C).

Continue giving 5 back blows and 5 abdominal thrusts until—

- The object is forced out.
- The victim begins to breathe or cough forcefully on his or her own.
- The victim becomes unconscious.

What to Do—

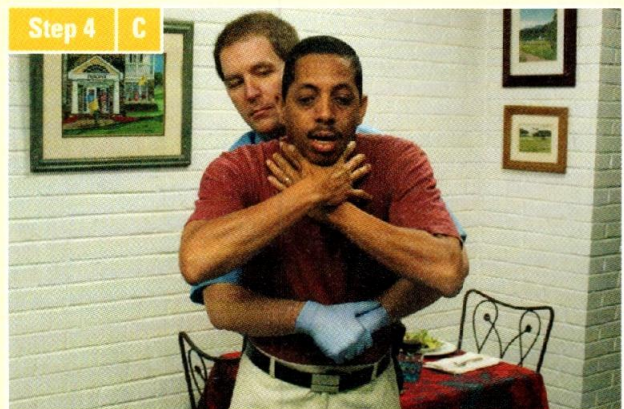
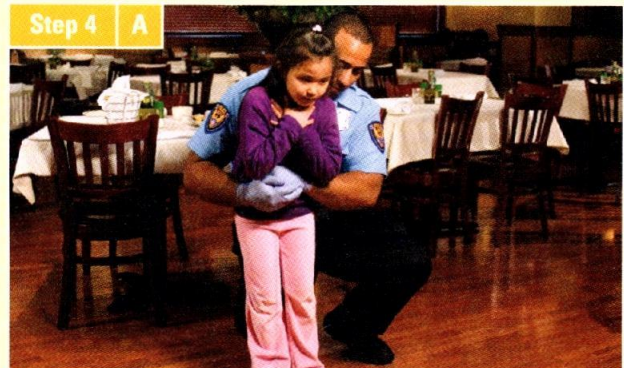
If the victim becomes unconscious, go to—

- Unconscious Choking—Adult and Child Skill Sheet, pages 40-42.

Note: Some conscious choking victims may need chest thrusts instead of abdominal thrusts.

Use chest thrusts if—

- You cannot reach far enough around the victim to give abdominal thrusts.
- The victim is obviously pregnant or known to be pregnant.



Skill Sheet | Conscious Choking—Infant

Remember: *If a parent or guardian is present, obtain consent before caring for a conscious choking infant. Tell the infant's parent or guardian your level of training and the care you are going to provide. If the parent or guardian is not available, consent is implied.*

STEP 1

If the infant cannot cough, cry or breathe, carefully position the infant face-down along your forearm.

- Support the infant's head and neck with your hand.
- Lower the infant onto your thigh, keeping the infant's head lower than his or her chest.

STEP 2

Give 5 back blows.

- Use the heel of your hand.
- Give back blows between the infant's shoulder blades.
- Each back blow should be a distinct attempt to dislodge the object.



STEP 3

Position the infant face-up along your forearm.

- Position the infant between both of your forearms, supporting the infant's head and neck.
- Turn the infant face-up.
- Lower the infant onto your thigh with the infant's head lower than his or her chest.

STEP 4

Give 5 chest thrusts.

- Put 2 or 3 fingers on the center of the chest just below the nipple line.
- Compress the chest 5 times about $\frac{1}{2}$ - 1 inch.
- Each chest thrust should be a distinct attempt to dislodge the object.

Continue giving 5 back blows and 5 chest thrusts until—

- The object is forced out.
- The infant begins to cough or breathe on his or her own.
- The infant becomes unconscious.

What to Do—**If the infant becomes unconscious, go to—**

- Unconscious Choking—Infant Skill Sheet, pages 43-44.



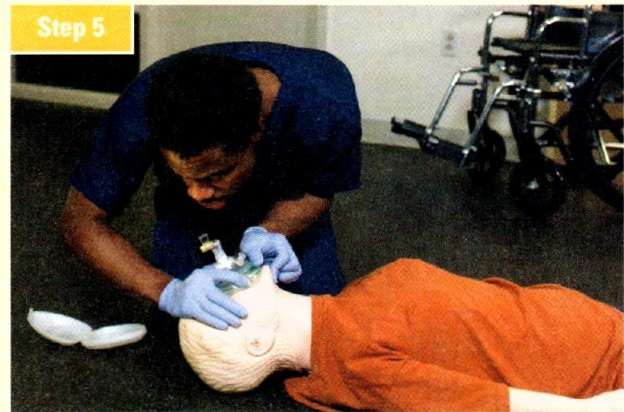
Skill Sheet | Unconscious Choking—Adult and Child

Complete Steps 1-4, Initial Assessment Skill Sheet, pages 28-29.

STEP 5

If rescue breaths do not make the chest clearly rise, reposition the airway by tilting the head farther back and try 2 rescue breaths again.

- For a child, reposition the airway by retilting the child's head and try 2 rescue breaths again.



STEP 6

If rescue breaths still do not make the chest clearly rise, give 5 chest thrusts.

- Place the heel of one hand on the center of the chest.
- Place the other hand on top of the first hand and compress the chest 5 times.
- **For an adult**, compress the chest about 1½ to 2 inches.
- **For a child**, compress the chest about 1 to 1½ inches.
- Each chest thrust should be a distinct attempt to dislodge the object.
- Compress at a rate of about 100 compressions per minute.



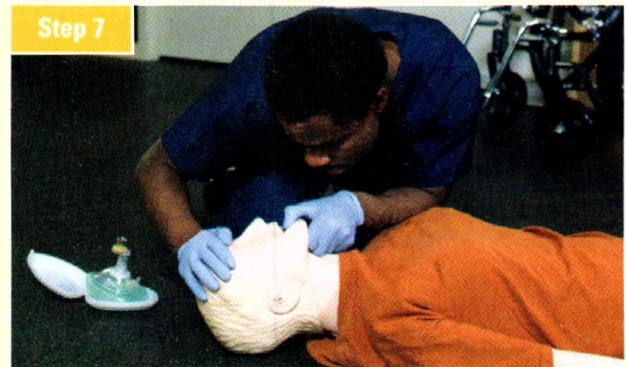
✓ PROFESSIONAL RESCUER TIPS:

- *Keep your fingers off the chest when giving chest thrusts.*
- *Use your body weight, not your arms, to compress the chest.*
- *Position your shoulders over your hands with your elbows locked.*
- *You can also use one hand to compress the chest of a child. If you are using one hand, place one hand on the center of the child's chest and the other hand on the child's forehead.*

STEP 7

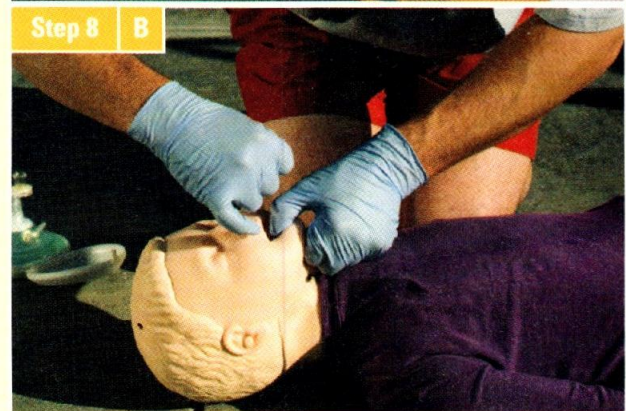
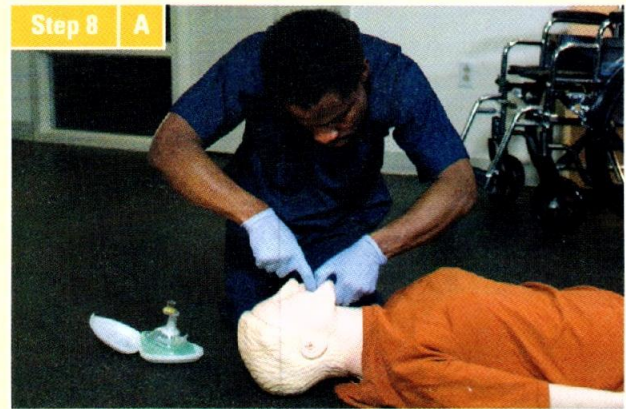
Look inside the victim's mouth.

- Grasp the tongue and lower jaw between your thumb and fingers and lift the jaw.

**STEP 8**

If you see the object, take it out.

- **For an adult**, remove the object with your index finger by sliding the finger along the inside of the cheek, using a hooking motion to sweep the object out (A).
- **For a child**, remove the object with your little finger by sliding it along the inside of the cheek, using a hooking motion to sweep the object out (B).

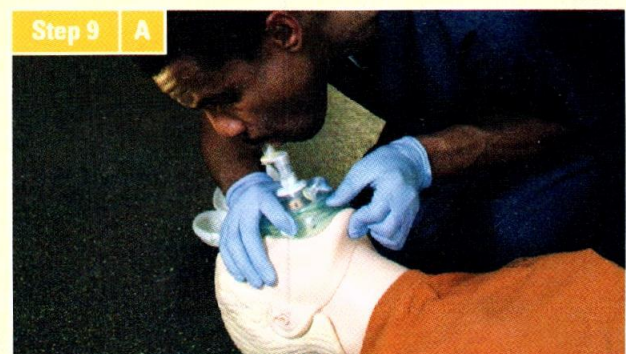
**STEP 9**

Replace the resuscitation mask and give 2 rescue breaths (A).

What to Do—

If the rescue breaths still do not make the chest clearly rise—

- Repeat Steps 6-9.



Continued

Skill Sheet | Unconscious Choking—Adult and Child—cont'd

If the rescue breaths make the chest clearly rise—

- Remove the mask, look for movement and check for breathing and a pulse for no more than 10 seconds (B).

If there is movement, breathing and a pulse—

- Place the victim in a recovery position (or modified-H.A.I.N.E.S. position if spinal injury is suspected) and continue to monitor the ABCs.
- Administer emergency oxygen, if available and you are trained to do so.

If there is a pulse, but no movement or breathing—

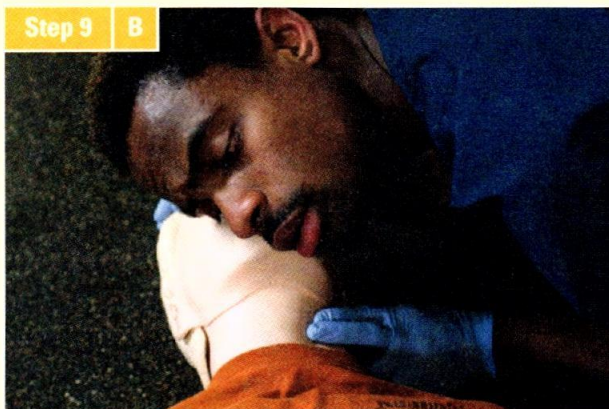
Give rescue breathing, go to—

- Rescue Breathing—Adult Skill Sheet, page 31.
- Rescue Breathing—Child Skill Sheet, page 32.

If there is no movement, breathing or pulse—

Perform CPR, go to—

- CPR—Adult and Child Skill Sheet, pages 52-53.
- Two-Rescuer CPR—Adult and Child Skill Sheet, pages 56-57.

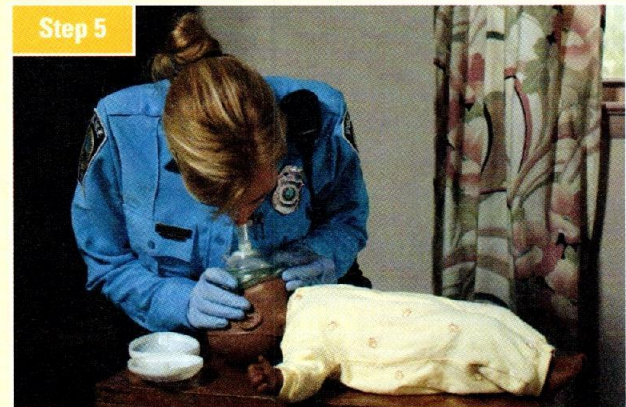


Skill Sheet | Unconscious Choking—Infant

Complete Steps 1-4, Initial Assessment Skill Sheet, pages 28-29.

STEP 5

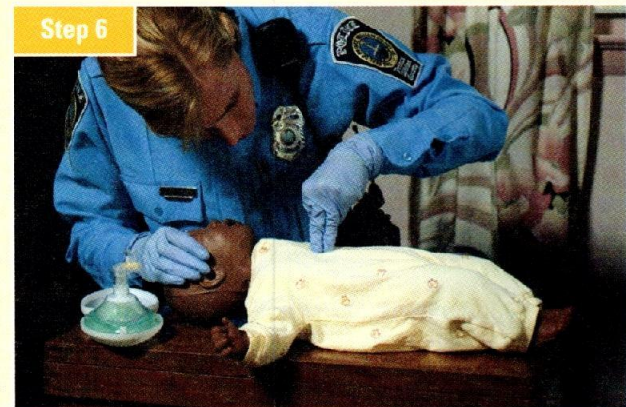
If rescue breaths do not make the chest clearly rise, reposition the airway by rettiling the infant's head and try 2 rescue breaths again.



STEP 6

If rescue breaths still do not make the chest clearly rise, remove the resuscitation mask and give 5 chest thrusts.

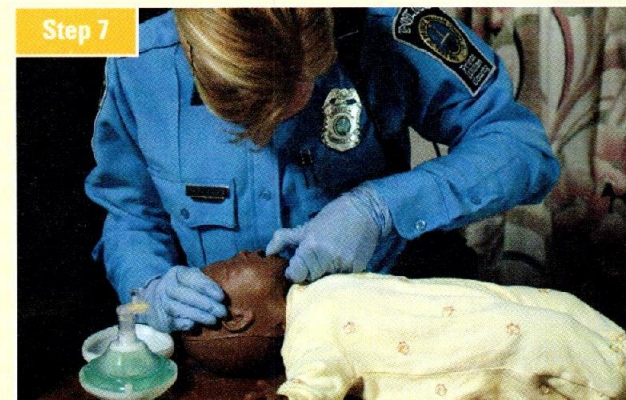
- Keep 1 hand on the infant's forehead to maintain an open airway.
- Put 2 or 3 fingers on the center of the chest just below the nipple line.
- Compress the chest about $\frac{1}{2}$ - 1 inch.
- Each chest thrust should be a distinct attempt to dislodge the object.
- Compress at a rate of about 100 compressions per minute.



STEP 7

Look for an object.

- Grasp the tongue and lower jaw between your thumb and fingers and lift the jaw.



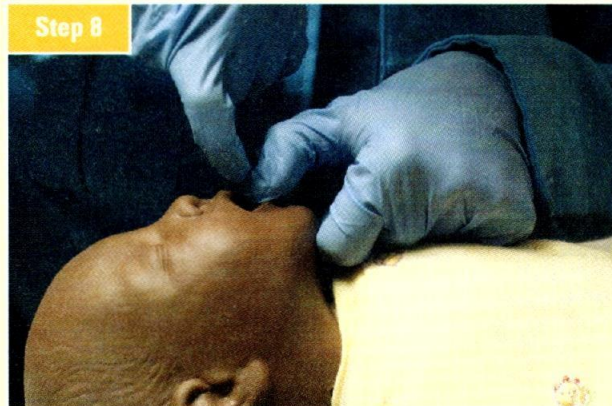
Continued

Skill Sheet | Unconscious Choking—Infant—cont'd

STEP 8

If you see the object, take it out.

- If you see an object, remove it with your little finger by sliding it along the inside of the cheek, using a hooking motion to sweep the object out.



STEP 9

Replace the resuscitation mask and give 2 rescue breaths (A).

What to Do—

If the rescue breaths still do not make the chest clearly rise—

- Repeat Steps 6-9.

If the rescue breaths make the chest clearly rise—

- Look for movement and check for breathing and a pulse for no more than 10 seconds (B).

If there is movement, breathing and a pulse—

- Maintain an open airway and continue to monitor the ABCs.
- Administer emergency oxygen, if available and you are trained to do so.

If there is a pulse, but no movement or breathing—

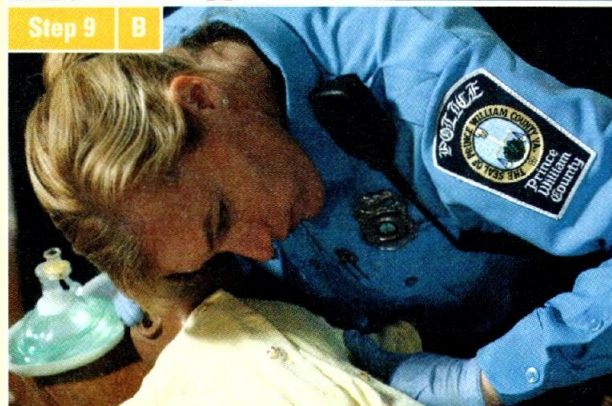
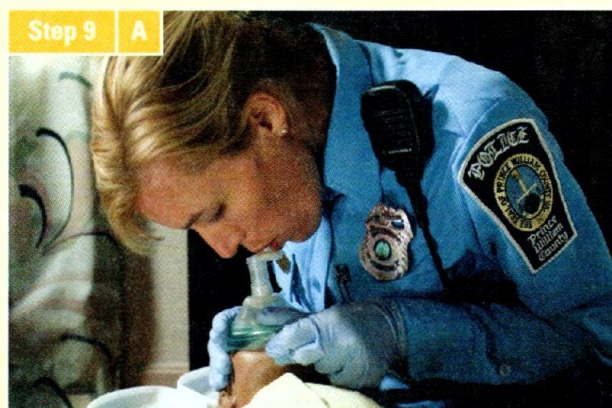
Give rescue breathing, go to—

- Rescue Breathing—Infant Skill Sheet, page 33.

If there is no movement, breathing or pulse—

Perform CPR, go to—

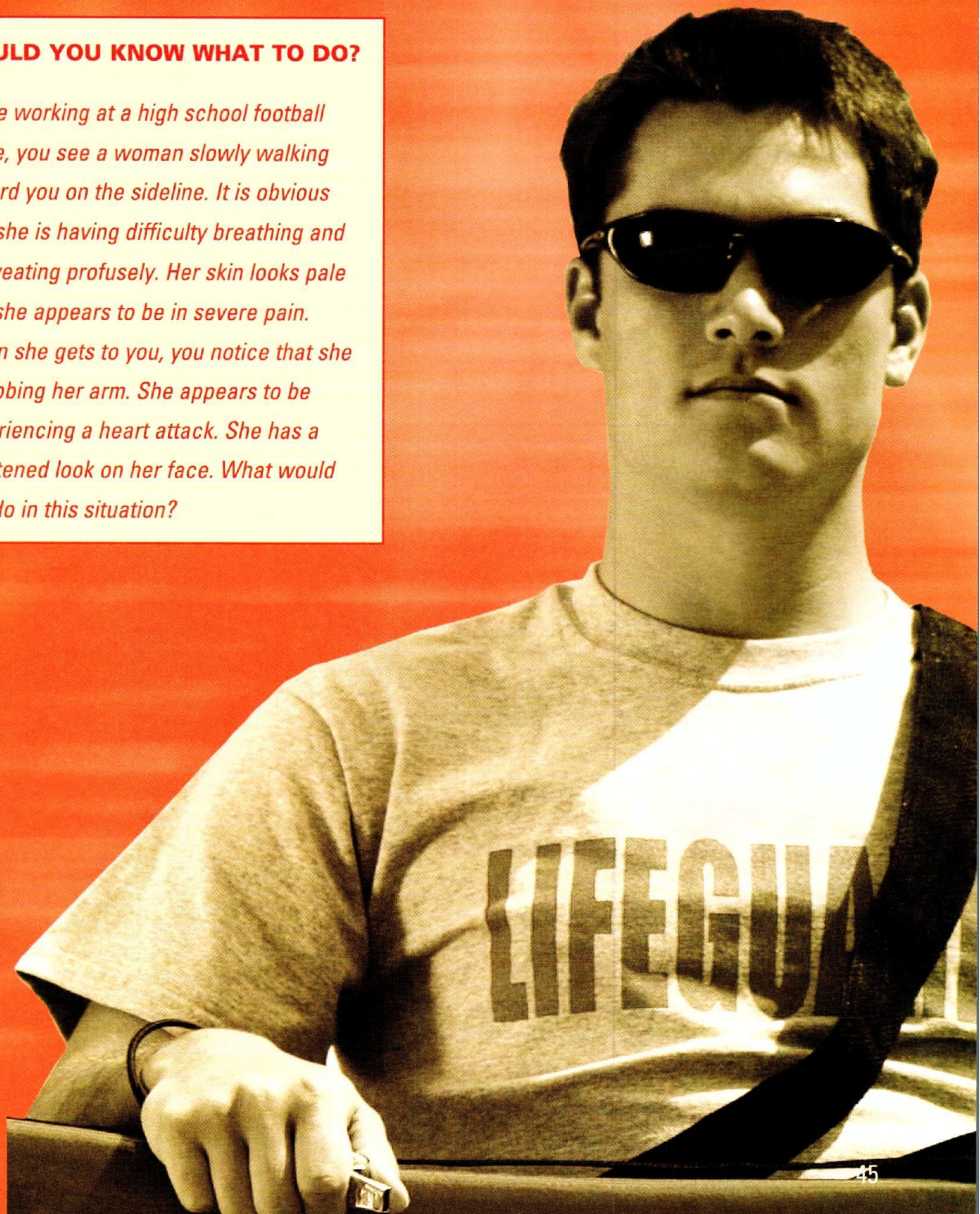
- CPR—Infant Skill Sheet, pages 54-55.
- Two-Rescuer CPR—Infant Skill Sheet, pages 58-60.



Cardiac Emergencies

WOULD YOU KNOW WHAT TO DO?

While working at a high school football game, you see a woman slowly walking toward you on the sideline. It is obvious that she is having difficulty breathing and is sweating profusely. Her skin looks pale and she appears to be in severe pain. When she gets to you, you notice that she is rubbing her arm. She appears to be experiencing a heart attack. She has a frightened look on her face. What would you do in this situation?



CARDIAC CHAIN OF SURVIVAL

During the initial assessment, you learned to identify and care for life-threatening conditions. Your priorities focused on the victim's airway, breathing and circulation (ABCs). As a professional rescuer, you must learn how to provide care for cardiac emergencies, such as heart attack and cardiac arrest. To effectively respond to cardiac emergencies, it helps to understand the importance of the Cardiac Chain of Survival. The four links in the cardiac chain of survival are—

1. **Early recognition of the emergency and early access to EMS.** The sooner more advanced medical personnel or the local emergency number is called, the sooner EMS personnel arrive and take over.
2. **Early cardiopulmonary resuscitation (CPR).** CPR helps supply oxygen to the brain and other vital organs to keep the victim alive until an automated external defibrillator (AED) is used or advanced medical care is given.
3. **Early defibrillation.** An electrical shock called defibrillation may restore a normal heart rhythm. Each minute defibrillation is delayed reduces the victim's chance of survival by about 10 percent.

4. **Early advanced medical care.** EMS personnel provide more advanced medical care and transport the victim to the hospital.

Common Causes of a Heart Attack

Heart attacks usually result from cardiovascular disease. Cardiovascular disease is the leading cause of death for adults in the United States. Cardiovascular disease develops slowly. Deposits of cholesterol, a fatty substance made by the body, and other material may gradually build up on the inner walls of the arteries (Fig. 4-1). This condition, called *atherosclerosis*, causes these vessels to progressively narrow. When coronary arteries narrow, a heart attack may occur. Other common causes of heart attack include respiratory distress, electrocution and traumatic injury.

Recognizing a Heart Attack

When the muscle of the heart suffers a loss of oxygenated blood, the result is a myocardial infarction (MI), or heart attack. The sooner you recognize the signs and symptoms of a heart attack and act, the better chance you have to save a life. Many people will deny they are

having a heart attack. Summon advanced medical personnel if the victim shows some or all of the following signs and symptoms:

- **Discomfort, pressure or pain.** The major signal is persistent discomfort, pressure or pain in the chest that does not go away. Unfortunately, it is not always easy to distinguish heart attack pain from the pain of indigestion, muscle spasms or other conditions. This often causes people to delay getting medical care. Brief, stabbing pain or pain that gets worse when you bend or breathe deeply is not usually caused by a heart problem.

The pain associated with a heart attack can range from discomfort to an unbearable crushing sensation in the chest. The victim may describe it as pressure, squeezing, tightness, aching or heaviness in the chest. Many heart attacks start slowly, as mild pain or discomfort. Often the victim feels discomfort or pain in the center of the chest (Fig. 4-2). It may spread to the shoulder, arm, neck, jaw or back. The discomfort or pain becomes constant. It is usually not relieved by resting, changing posi-

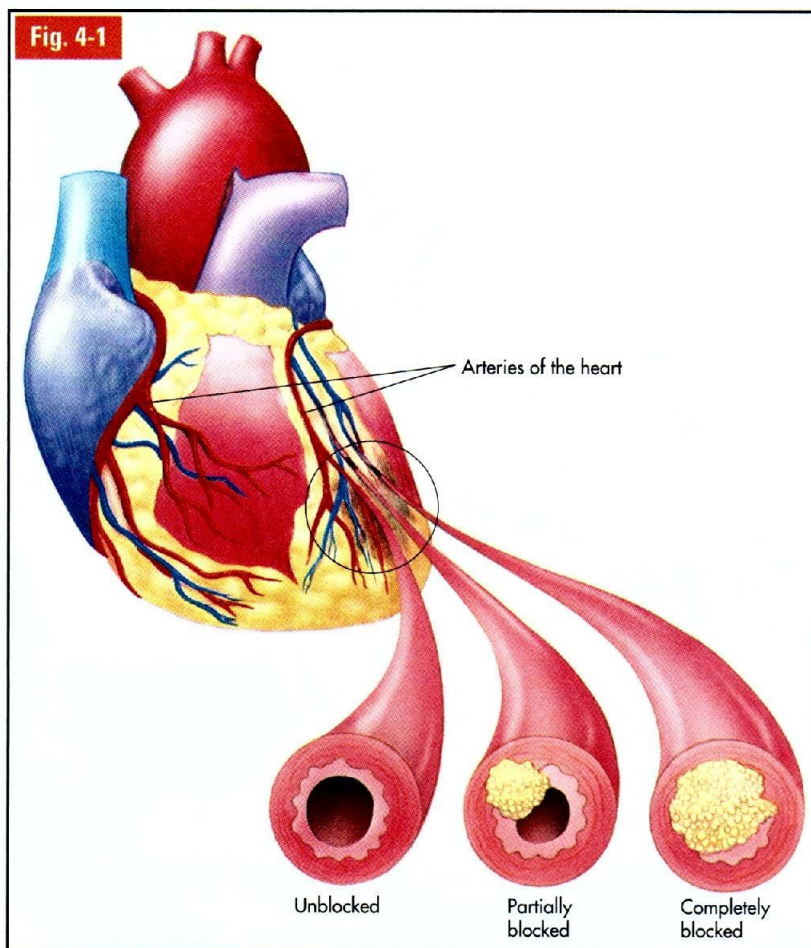
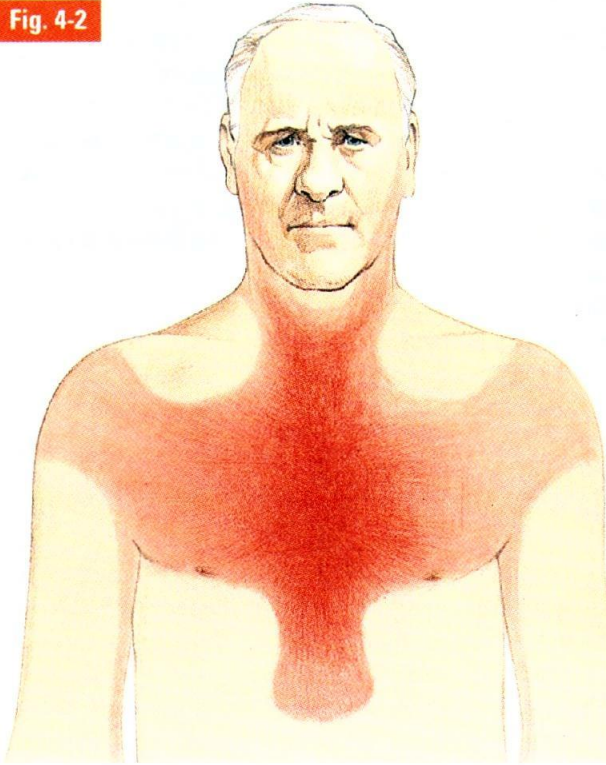


Fig. 4-2



tion or taking medicine. When interviewing the victim, a rescuer should ask open-ended questions, such as “Can you describe the pain for me?” and allow the victim to respond in his or her own words.

Any chest pain that is severe, lasts longer than 3 to 5 minutes, goes away and comes back or persists even during rest requires medical care at once. Even people who have had a previous heart attack may not recognize the signs and symptoms because each heart attack can have entirely different signs and symptoms.

- **Pain that comes and goes.** Some people with coronary heart disease may have chest pain or pressure that comes and goes. This type of pain is called *angina pectoris*, a medical term for pain in the chest. It develops when the heart needs more oxygen than it gets because the arteries leading to it are too narrow. When a person with angina is exercising, excited or emotionally upset, the heart might not get enough oxygen. This lack of oxygen can cause chest discomfort or pain.

A person who knows he or she has angina may tell you

so. People with angina usually have medicine to take to stop the pain. Stopping physical activity or easing the distress and taking the medicine usually ends the discomfort or pain of angina.

- **Trouble breathing.** Another signal of a heart attack is trouble breathing. The victim may be breathing faster than normal because the body tries to get much-needed oxygen to the heart.
- **Other signs and symptoms.** The victim’s skin may be pale or ashen, especially around the face. The face also may be damp with sweat. Some people suffering from a heart attack sweat heavily or feel dizzy. These signs and symptoms are caused by the stress put on the body when the heart does not work as it should. Both men and women experience the most common signs and symptoms of a heart attack—chest pain or discomfort. But women are somewhat more likely to experience some of the other warning signals, particularly shortness of breath, nausea or vomiting and back or jaw pain. Women also tend to delay telling others about their signs and symptoms to avoid bothering or worrying them.

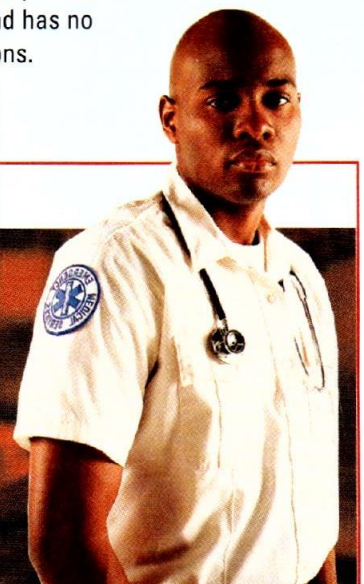
Care for a Heart Attack

If you think someone is having a heart attack—

- Take immediate action and summon advanced medical personnel.
- Have the victim stop what he or she is doing and rest.
- Loosen any tight or uncomfortable clothing.
- Closely monitor the victim until advanced medical personnel arrive. Notice any changes in the victim’s appearance or behavior.
- Comfort the victim.
- If medically appropriate and local protocols or medical direction permit, give aspirin if the victim can swallow and has no known contraindications.

REMEMBER:

Take immediate action
if you suspect someone
is having a heart attack.



- Assist the victim with his or her prescribed medication and give emergency oxygen, if it is available and you are trained to do so.
- Be prepared to give CPR or use an AED.

Aspirin Administration

You may be able to help a conscious victim who is showing early signs and symptoms of a heart attack by offering him or her an appropriate dose of aspirin when the signs and symptoms first begin. However, offer aspirin only if medically appropriate and local protocols allow and never delay calling 9-1-1 to do this. Always call 9-1-1 as soon as you recognize the signs and symptoms, and then help the victim to be comfortable before you give the aspirin.

Then, if the victim is able to take medicine by mouth, ask the victim—

- Are you allergic to aspirin?
- Do you have a stomach ulcer or stomach disease?
- Are you taking any blood thinners, such as Coumadin™ or Warfarin™?
- Have you been told by a doctor not to take aspirin?

If the victim answers no to all of these questions, you may offer him or her two chewable (162-mg) baby aspirins, or up to one 5-grain (325-mg) adult aspirin tablet with a small amount of water. Be sure that you only use aspirin and not Tylenol™, acetaminophen, Motrin™, Advil™ or ibuprofen, which are painkillers. Likewise, do not use coated aspirin products or products meant for multiple uses such as cold, fever and headache.

You may also offer these doses of aspirin if you have cared for the victim and he or she has regained consciousness and is able to take the aspirin by mouth.

Note: Rescuers should follow local protocols or medical directives when applicable.

Cardiac Arrest

Cardiac arrest is a life-threatening emergency. It may be caused by a heart attack, electrocution, respiratory arrest, drowning or other conditions. Cardiac arrest occurs when the heart stops beating or is beating too irregularly or weakly to circulate blood effectively. It can occur suddenly and without warning. In many cases, the victim may already be experiencing the signs and symptoms of a heart attack.

The signs of a cardiac arrest include—

- Unconsciousness.
- No movement or breathing.
- No pulse.

CPR

A victim who is unconscious, not moving or breathing and has no pulse is in cardiac arrest and needs CPR. CPR is a combination of rescue breaths and chest compressions. Summoning advanced medical personnel immediately is critical for the victim's survival. If you are trained and an AED is available, use it according to your local protocol and in combination with CPR until more advanced medical personnel arrive and take over.

Effective chest compressions are essential for quality CPR. Effective chest compressions circulate blood to the victim's brain and other vital organs. Chest compressions can also increase the likelihood that a successful shock can be delivered to a victim suffering a sudden cardiac arrest, especially if more than 4 minutes have elapsed since the victim's collapse. To ensure quality CPR (**Table 4-1**)—

- Chest compressions should be performed at a rate of about 100 compressions per minute for any victim.
- Chest compressions should be deep. Compress the chest of an adult about 1½ to 2 inches, a child about 1-1½ inches and an infant about ½ to 1 inch.
- Let the chest fully recoil to its normal position after each compression before starting the next compression.

Continue CPR until another trained rescuer arrives and takes over, an AED is available and ready to use, you are too exhausted to continue, the scene becomes unsafe or you notice an obvious sign of life. When giving CPR, it is not unusual for the victim's ribs to break or cartilage to separate. The victim may vomit and the scene may be chaotic. As a professional rescuer with a duty to respond, you need to understand that despite your best efforts to give quality care, not all victims of cardiac arrest survive.

Adult CPR

If an unconscious adult is not moving or breathing and has no pulse, begin CPR. Give cycles of 30 chest compressions and 2 rescue breaths. Give compressions at the rate of about 100 compressions per minute. Use two hands in the center of the chest for compressions. Compress the chest about 1½ to 2 inches. Let the chest fully recoil to its normal position after each compression.

For additional information on Adult CPR, refer to CPR—Adult and Child Skill Sheet, pages 52-53.

Child and Infant CPR

CPR for children and infants is similar to the technique used for adults but is modified because of their smaller body sizes. Cardiac arrest in children and infants is usually caused by a respiratory emergency. If you recognize that a child or infant is in respiratory distress or arrest, provide care immediately. If cardiac arrest occurs, begin CPR. Give cycles of 30 chest compressions and 2 rescue breaths. Give compressions at the rate of about 100 compressions per minute. For a child, use two hands on the


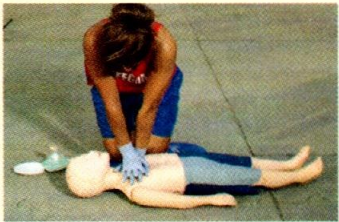

center of the chest for compressions. For an infant, use 2 or 3 fingers on the center of the chest, just below the nipple line for compressions. Compress the chest about 1 to 1½ inches for a child and about ½ to 1 inch for an infant. Let the chest fully recoil to its normal position after each compression.

For additional information on Child and Infant CPR, refer to CPR—Adult and Child Skill Sheet, pages 52-53 or CPR—Infant Skill Sheet, pages 54-55.

Two-Rescuer CPR

When an additional rescuer is available, provide two-rescuer CPR. One rescuer gives rescue breaths and the other rescuer gives chest compressions. When providing two-rescuer CPR to an adult, rescuers should perform 30 compressions and 2 rescue breaths during each cycle. When performing two-rescuer CPR on a child or infant, rescuers should change the compression to ventilation ratio to 15:2. This provides more frequent respiration for children and infants. Professional rescuers should change positions (alternate turns giving compressions

TABLE 4-1 SUMMARY OF TECHNIQUES FOR ADULT, CHILD AND INFANT CPR

	Adult	Child	Infant
			
Hand Position:	Two hands on the center of the chest	Two hands or one hand on the center of the chest.	Two or three fingers on the center of the chest (just below the nipple line)
Compress:	About 1½-2 inches	About 1-1½ inches	About ½ -1 inch
Breathe:	Until chest clearly rises (about 1 second per breath)	Until chest clearly rises (about 1 second per breath)	Until chest clearly rises (about 1 second per breath)
Cycle: (1 rescuer)	30 compressions 2 breaths	30 compressions 2 breaths	30 compressions 2 breaths
Cycle: (2 rescuers)	30 compressions 2 breaths	15 compressions 2 breaths	15 compressions 2 breaths
Rate:	About 100 compressions per minute	About 100 compressions per minute	About 100 compressions per minute

and breaths) every 2 minutes for an adult, child or infant. Changing positions should take less than 5 seconds. When providing two-rescuer CPR to an infant, rescuers should perform the two-thumb-encircling-hands chest compression technique with thoracic squeeze. Perform two-rescuer CPR in the following situations:

- Two rescuers arrive on the scene at the same time and begin CPR together
- One rescuer is giving CPR and a second rescuer becomes available

When CPR is in progress by one rescuer and a second rescuer arrives, the second rescuer should ask whether advanced medical personnel have been summoned. If advanced medical personnel have not been summoned, the second rescuer should do so before getting the AED or assisting with care. If advanced medical personnel have been summoned, the second rescuer should get the AED or if an AED is not available the

second rescuer should help perform two-rescuer CPR. For additional information on two-rescuer CPR, refer to Two-Rescuer CPR—Adult and Child Skill Sheet, pages 56-57 and Two-Rescuer CPR—Infant Skill Sheet, pages 58-60.

CPR—Special Situations

Professional rescuers should continue CPR without interruptions for as long as possible. They should limit any interruptions to only seconds, except for specific interventions, such as insertion of an advanced airway or use of a defibrillator. You may have to move a victim to give CPR:

- In a stairwell, move the victim to a flat area at the head or foot of the stairs to perform CPR (do not interrupt CPR for longer than about 30 seconds).
- Do not interrupt CPR while a victim is being transferred to an ambulance or into the emergency department.

REMEMBER:

When CPR is in progress by one rescuer and a second rescuer arrives, the second rescuer should ask whether advanced medical personnel have been summoned. If advanced medical personnel have not been summoned, the second rescuer should do so before getting the AED or assisting with care.



AUTOMATED EXTERNAL DEFIBRILLATION

Each year, approximately 500,000 Americans die of cardiac arrest. CPR started promptly can help by keeping blood containing oxygen flowing to the brain and other vital organs. However, in many cases, CPR alone cannot correct the underlying heart problem. An automated external defibrillator (AED) is needed to correct the problem. An AED is an automated device that recognizes a heart rhythm that requires a shock. It can then charge itself and prompt the operator to deliver a life-saving shock to the victim by pressing a button. For additional information on AEDs, refer to Chapter 5, AEDs, page 61.

ADMINISTERING EMERGENCY OXYGEN

The normal concentration of oxygen in the air is approximately 21 percent. Under normal conditions, this is more than enough oxygen to sustain life. However, when serious injury or sudden illness occurs, the body does not function properly and can benefit from emergency

oxygen. Emergency oxygen provides a substantially higher oxygen concentration, in some cases nearly 100 percent, to the victim. A higher concentration of oxygen being delivered to a victim can help counter the effects of a life-threatening injury or illness to the body. The American Red Cross offers optional training in the use of emergency oxygen. For additional information on administering emergency oxygen, refer to Chapter 6, Emergency Oxygen, page 73.

PUTTING IT ALL TOGETHER

As a professional rescuer, you should be able to recognize and respond to cardiac emergencies. You should understand the importance of the four links of the Cardiac Chain of Survival: early recognition of the emergency and early access to EMS, early CPR, early defibrillation and early advanced medical care. You should be able to recognize and care for the signs and symptoms of a heart attack. You also should know how to recognize and care for a victim of cardiac arrest.

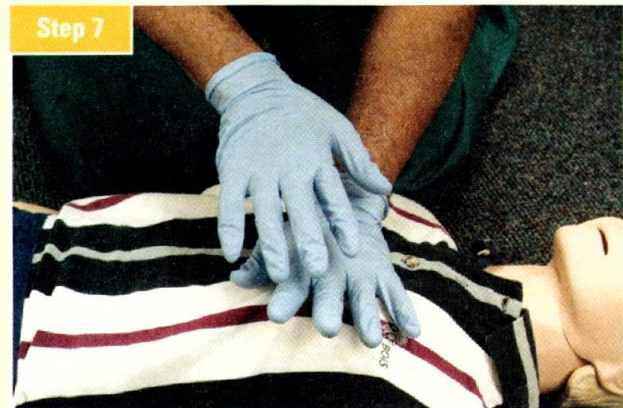
Skill Sheet | CPR—Adult and Child

Complete Steps 1-6, Initial Assessment Skill Sheet, pages 28-30.

STEP 7

Find the correct hand position to give compressions.

- Place the heel of one hand on the center of the chest.
- Place the other hand on top.



STEP 8

Give 30 chest compressions.

- **For an adult**, compress the chest about 1½ to 2 inches
- **For a child**, compress the chest about 1 to 1½ inches.
- Let the chest fully recoil to its normal position after each compression.
- Compress at a rate of about 100 compressions per minute.



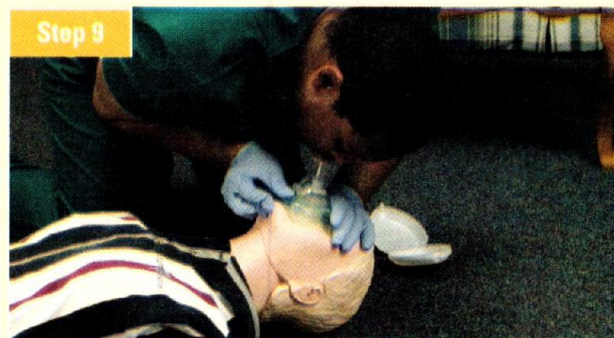
✓ PROFESSIONAL RESCUER TIPS:

- *Keep your fingers off the chest when giving compressions.*
- *Use your body weight, not your arms, to compress the chest.*
- *Position your shoulders over your hands with your elbows locked.*
- *Counting out loud helps keep an even pace.*
- *You can also use one hand to compress the chest of a child. If you are using one hand, place one hand on the center of the child's chest and the other hand on the child's forehead.*

STEP 9

Replace the resuscitation mask and give 2 rescue breaths.

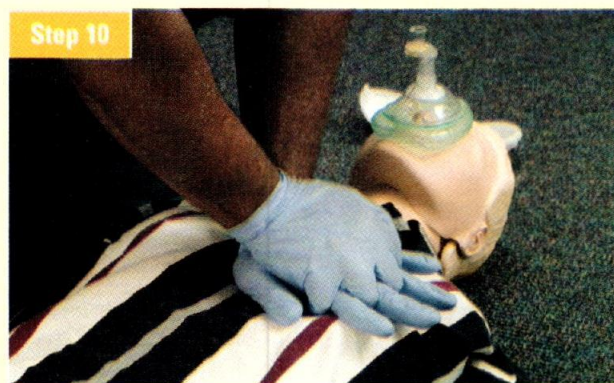
- Each rescue breath should last about 1 second.
- Give rescue breaths that make the chest clearly rise.

**STEP 10**

Do cycles of 30 compressions and 2 rescue breaths.

Continue CPR until—

- Another trained rescuer arrives and takes over.
- An AED is available and ready to use.
- You are too exhausted to continue.
- The scene becomes unsafe.
- You notice an obvious sign of life.



Skill Sheet | CPR—Infant

Complete Steps 1-6, *Initial Assessment Skill Sheet*, pages 28-30.

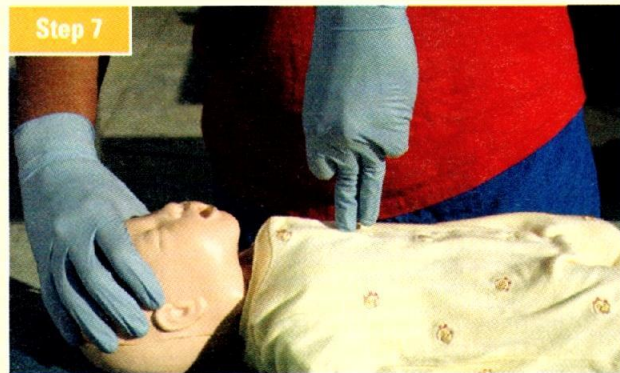
✓ PROFESSIONAL RESCUER TIP:

Place the infant on his or her back on a firm, flat surface, such as the floor or a table.

STEP 7

Find the correct hand position to give compressions.

- Put 2 or 3 fingers on the center of the chest just below the nipple line.
- Keep one hand on the infant's forehead to maintain an open airway.



STEP 8

Give 30 chest compressions.

- Compress the chest about $\frac{1}{2}$ - 1 inch.
- Let the chest fully recoil to its normal position after each compression.
- Compress at a rate of about 100 compressions per minute.



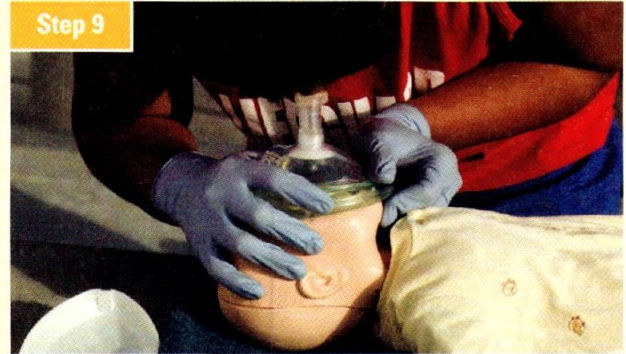
✓ PROFESSIONAL RESCUER TIP:

- *Counting out loud helps keep an even pace.*

STEP 9

Replace the resuscitation mask and give 2 rescue breaths.

- Each rescue breath should last about 1 second.
- Give rescue breaths that make the chest clearly rise.



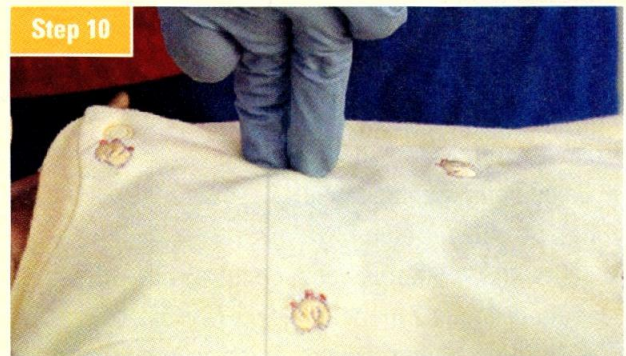
Step 9

STEP 10

Do cycles of 30 compressions and 2 rescue breaths.

Continue CPR until—

- Another trained rescuer arrives and takes over.
- You are too exhausted to continue.
- The scene becomes unsafe.
- You notice an obvious sign of life.



Step 10

Skill Sheet | Two-Rescuer CPR—Adult and Child

Rescuer 1 completes Steps 1-6, Initial Assessment Skill Sheet, pages 28-30.

STEP 7

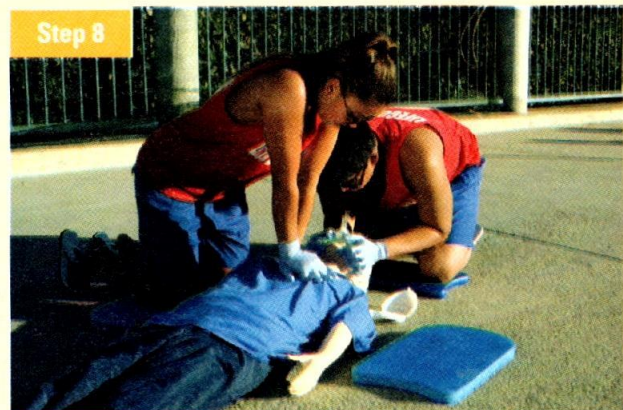
Rescuer 2 finds the correct hand position to give compressions.

- Places the heel of one hand on the center of the chest.
- Places the other hand on top.

STEP 8

Rescuer 2 gives chest compressions.

- Gives compressions when Rescuer 1 says “Victim has no pulse. Begin CPR.”
 - **Adult:** 30 compressions, compress the chest about 1½ to 2 inches
 - **Child:** 15 compressions, compress the chest about 1 to 1½ inches
- Lets the chest fully recoil to its normal position after each compression.
- Compresses at a rate of about 100 compressions per minute.



✓ PROFESSIONAL RESCUER TIPS:

- *Keep your fingers off the chest when giving compressions.*
- *Use your body weight, not your arms, to compress the chest.*
- *Position your shoulders over your hands with your elbows locked.*
- *Counting out loud helps keep an even pace.*
- *You can also use one hand to compress the chest of a child. If you are using one hand, place one hand on the center of the child's chest and the other hand on the child's forehead.*

STEP 9

Rescuer 1 replaces the mask and gives 2 rescue breaths.

- Each rescue breath should last about 1 second.
- Gives rescue breaths that make the chest clearly rise.

STEP 10

Do about 2 minutes of compressions and breaths.

- **Adult:** cycles of 30 compressions and 2 rescue breaths
- **Child:** cycles of 15 compressions and 2 rescue breaths

STEP 11

Change positions.

- Rescuer 2 calls for a position change by using the word “change” at the end of the last compression cycle.
- Rescuer 1 gives 2 rescue breaths.
- Rescuer 2 moves to the victim’s head with his or her own mask.
- Rescuer 1 moves into position at the victim’s chest and locates correct hand position on the victim’s chest.
- Changing positions should take less than 5 seconds.

STEP 12

Rescuer 1 gives chest compressions.

- Continue cycles of compressions and rescue breaths.

Continue CPR until—

- Another trained rescuer arrives and takes over.
- An AED is available and ready to use.
- You are too exhausted to continue.
- The scene becomes unsafe.
- You notice an obvious sign of life.



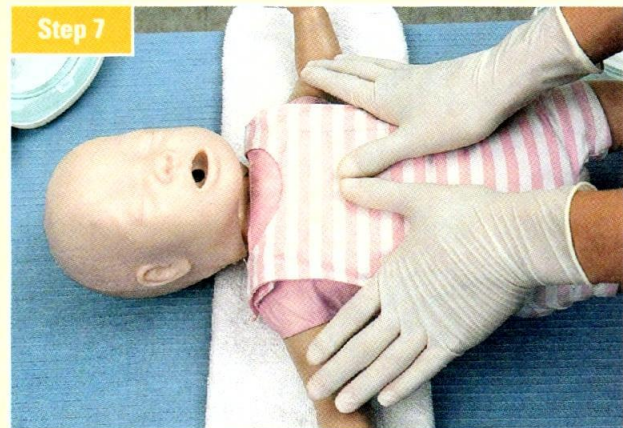
Skill Sheet | Two-Rescuer CPR—Infant

Rescuer 1 completes Steps 1-6, Initial Assessment Skill Sheet, pages 28-30.

STEP 7

Rescuer 2 finds the correct hand position to give compressions.

- Place thumbs next to each other on the center of the chest just below the nipple line.
- Place both hands underneath the infant's back and support the infant's back with your fingers.
- Ensure that your hands do not compress or squeeze the side of the ribs.
- If available, a towel or padding can be placed underneath the infant's shoulders to help maintain the head in the neutral position.



STEP 8

Rescuer 2 gives 15 chest compressions.

- Give compressions when Rescuer 1 says "Victim has no pulse, begin CPR."
- Use both thumbs to compress the chest about $\frac{1}{2}$ - 1 inch at a rate of about 100 compressions per minute.
- Let the chest fully recoil to its normal position after each compression.



✓ PROFESSIONAL RESCUER TIP:

- *Counting out loud helps keep an even pace.*

STEP 9

Rescuer 1 replaces the mask and gives 2 rescue breaths.

- Each rescue breath should last about 1 second.
- Gives rescue breaths that make the chest clearly rise.

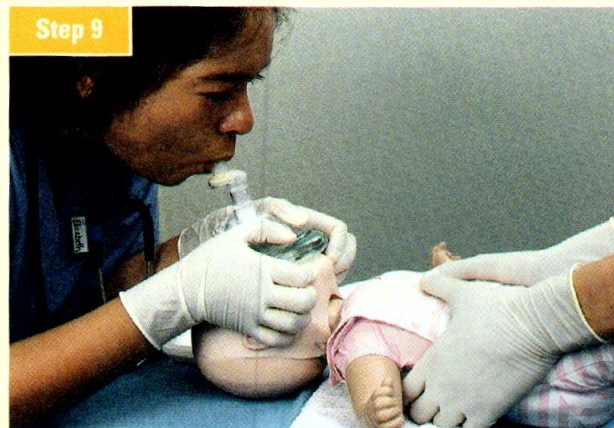
STEP 10

Do cycles of 15 chest compressions and 2 rescue breaths.

STEP 11

Change positions.

- Rescuer 2 calls for a position change by using the word “change” in place of the word “15” in the last compression cycle.
- Rescuer 1 gives 2 rescue breaths.
- Rescuer 2 moves to the infant’s head with his or her own mask.
- Rescuer 1 moves into position and locates correct finger placement on the infant’s chest.
- Changing positions should take less than 5 seconds.



Skill Sheet | Two-Rescuer CPR—Infant—cont'd

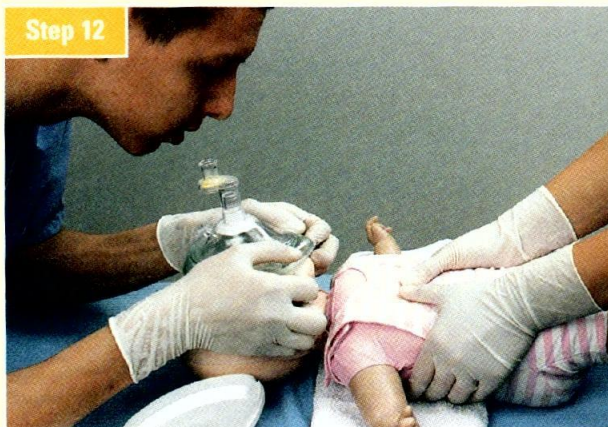
STEP 12

Rescuer 1 gives chest compressions.

- Continue cycles of 15 compressions and 2 rescue breaths.

Continue CPR until—

- Another trained rescuer arrives and takes over.
- You are too exhausted to continue.
- The scene becomes unsafe.
- You notice an obvious sign of life.



Automated External Defibrillation

WOULD YOU KNOW WHAT TO DO?

A woman suddenly collapses while running laps. She is lying on the track's surface and does not appear to be moving. You recognize the emergency and perform an initial assessment. You determine that she is unconscious, not moving or breathing and has no pulse. The facility has an automated external defibrillator (AED). How would you respond? Would you know what to do?



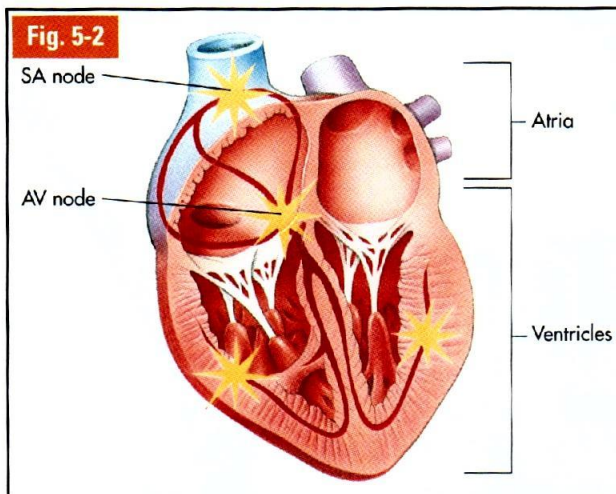
Each year, approximately 500,000 Americans die of cardiac arrest. When started promptly cardiopulmonary resuscitation (CPR) can help by supplying oxygen to the brain and other vital organs. However, in many cases, CPR by itself cannot correct the underlying heart problem. An AED is needed to correct the problem and return the heart to a normal rhythm (Fig. 5-1). AEDs provide an electrical shock to the heart, called defibrillation. The sooner the shock is administered, the greater the likelihood of the victim's survival. Professional rescuers must assess victims quickly and be prepared to use an AED in cases of cardiac arrest. This chapter covers the basic principles of how AEDs work and how to use them.

Fig. 5-1



THE HEART'S ELECTRICAL SYSTEM

The heart's electrical system controls the pumping action of the heart. Under normal conditions, specialized cells of the heart initiate and transmit electrical impulses. These cells make up the *conduction system*. Electrical impulses travel through the upper chambers of the heart, called the *atria*, to the lower chambers of the heart, called the *ventricles* (Fig. 5-2).



The normal point of origin of the electrical impulse is the *sinoatrial (SA) node* above the atria. This impulse travels to a point midway between the atria and ventricles. This point is called the *atrioventricular (AV) node*.

The pathway divides after the AV node into two branches, then into the right and left ventricles. These right and left branches become a network of fibers, called *Purkinje fibers*, which spread electrical impulses across the heart. Under normal conditions, this impulse reaches the muscular walls of the ventricles and causes the ventricles to contract. This contraction forces blood out of the heart to circulate through the body. The contraction of the left ventricle results in a pulse. The pauses between the pulse beats are the periods between contractions. When the heart muscles contract, blood is forced out of the heart. When they relax, blood refills the chambers.

Electrical activity of the heart can be evaluated with a cardiac monitor or electrocardiograph. Electrodes attached to an electrocardiograph pick up electrical impulses and transmit them to a monitor. This graphic record is referred to as an *electrocardiogram (ECG)*. Heart rhythms appear on an ECG as a series of peaks and valleys.

WHEN THE HEART STOPS

Any damage to the heart from disease or injury can disrupt the heart's electrical system. This disruption can result in an abnormal heart rhythm that can stop circulation. The two most common treatable abnormal rhythms initially present in sudden cardiac arrest victims are *ventricular fibrillation (V-fib)* and *ventricular tachycardia (V-tach)*. V-fib is a state of totally disorganized electrical activity in the heart. It results in fibrillation, or quivering, of the ventricles. In this state, the ventricles cannot pump blood and there is no movement or breathing and no pulse. V-tach is a very rapid contraction of the ventricles. Though there is electrical activity resulting in a regular rhythm, the rate is often so fast that the heart is unable to pump blood properly. As with V-fib, there is no movement or breathing and no pulse.

DEFIBRILLATION

In many cases, V-fib and V-tach rhythms can be corrected by early defibrillation. Delivering an electrical shock with an AED disrupts the electrical activity of V-fib and V-tach long enough to allow the heart to spontaneously develop an effective rhythm on its own. If V-fib or V-tach is not interrupted, all electrical activity will eventually cease, a condition called *asystole*. Asystole cannot be corrected by defibrillation. Remember that you cannot tell what, if any, rhythm the heart has by feeling for a pulse. CPR, started immediately and continued until defibrillation, helps maintain a low level of circulation in the body until the abnormal rhythm can be corrected by defibrillation.

AEDs AND THE CARDIAC CHAIN OF SURVIVAL

To effectively respond to cardiac emergencies, it helps to understand the importance of the Cardiac Chain of Survival. The four links in the cardiac chain of survival are—

1. **Early recognition of the emergency and early access to emergency medical services (EMS).** The sooner more advanced medical personnel or the local emergency number is called, the sooner EMS personnel arrive and take over.
2. **Early CPR.** CPR helps supply oxygen to the brain and other vital organs to keep the victim alive until an AED is used or advanced medical care is given.
3. **Early defibrillation.** An electrical shock called defibrillation may restore a normal heart rhythm. Each minute defibrillation is delayed reduces the victim's chance of survival by about 10 percent.
4. **Early advanced medical care.** EMS personnel provide more advanced medical care and transport the victim to the hospital.

USING AN AED—ADULT

When a cardiac arrest occurs, an AED should be used as soon as it is available and ready to use. If the AED advises that a shock is needed, the responder should follow protocols to provide 1 shock followed by 5 cycles (about 2 minutes) of CPR.

After a shock is delivered or if no shock is indicated, give 5 cycles (about 2 minutes) of CPR before analyzing the heart rhythm again. If, at any time, you notice an obvious sign of life, stop CPR and monitor airway, breathing and circulation (ABCs). Administer emergency oxygen, if it is available and you are trained to do so.

For additional information on using an AED, refer to:

- Using an AED—Adult and Child Skill Sheet, pages 67-69.
- Using an AED—Adult and Child, CPR in Progress Skill Sheet, pages 70-72.

USING AN AED—CHILD

While the incidence of cardiac arrest in children is relatively low compared with adults, cardiac arrest resulting from V-fib does happen to young children. Most cardiac arrests in

children are not sudden. Possible causes of cardiac arrest in children are—

- Airway and breathing problems.
- Traumatic injuries or accidents (e.g., automobile, drowning, electrocution or poisoning).
- A hard blow to the chest.
- Congenital heart disease.

AEDs equipped with pediatric AED pads are capable of delivering levels of energy to children between 1 and 8 years old or weighing less than 55 pounds. Use pediatric AED pads and/or equipment if available. If pediatric-specific equipment is not available, an AED designed for adults may be used on a child. Always follow local protocols and manufacturer's instructions. For a child in cardiac arrest, follow the same general steps and precautions that you would follow when using an AED on an adult.

After a shock is delivered or if no shock is indicated, give 5 cycles (about 2 minutes) of CPR before analyzing the heart rhythm again. If, at any time, you notice an obvious sign of life, stop CPR and monitor the ABCs. Administer emergency oxygen, if it is available and you are trained to do so.

For additional information on using an AED, refer to—

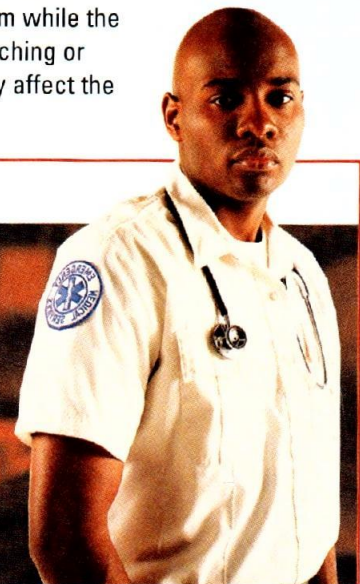
- Using an AED—Adult and Child Skill Sheet, pages 67-69.
- Using an AED—Adult and Child, CPR in Progress Skill Sheet, pages 70-72.

AED PRECAUTIONS

- Do not touch the victim while defibrillating. You or someone else could be shocked.
- Before shocking a victim with an AED, make sure that no one is touching or is in contact with the victim or the resuscitation equipment.
- Do not touch the victim while the AED is analyzing. Touching or moving the victim may affect the analysis.

REMEMBER:

When a cardiac arrest occurs, an AED should be used as soon as it is available and ready to use.



- Do not use alcohol to wipe the victim's chest dry. Alcohol is flammable.
- Do not defibrillate someone when around flammable or combustible materials such as gasoline or free-flowing oxygen.
- Do not use an AED in a moving vehicle. Movement may affect the analysis.
- Do not use an AED on a victim who is in contact with water. Move the victim away from puddles of water or swimming pools, or out of the rain before defibrillating.
- Do not use an AED and/or pads designed for adults on a child under age 8 or less than 55 pounds, unless pediatric pads specific to the device are not available. Local protocols may differ on this and should be followed.
- Do not use pediatric AED pads on an adult, as they may not deliver enough energy for defibrillation.
- Do not use an AED on a victim wearing a nitroglycerin patch or other patch on the chest. With a gloved hand, remove any patches from the chest before attaching the device.
- Do not use a mobile phone or radio within 6 feet of the AED. This may interrupt analysis.

AEDs—SPECIAL SITUATIONS

Some situations require professional rescuers to pay special attention when using an AED. These include using AEDs around water, AED use on victims with implantable devices or nitroglycerin patches and using an AED on victims of trauma or hypothermia. Be familiar with these situations and know how to respond appropriately. Always use common sense when using an AED and follow manufacturer's recommendations.

AEDs Around Water

If the victim was removed from the water, be sure there are no puddles of water around you, the victim or the AED. Remove wet clothing for proper pad placement if necessary. Dry the victim's chest and attach the AED.

If it is raining, ensure that the victim is as dry as possible and sheltered from the rain. Wipe the victim's chest dry. Minimize delaying defibrillation, though, when taking steps to provide for a dry environment. The electrical current of an AED is very directional between the pads. AEDs are very safe, even in rain and snow, when all precautions and manufacturer's operating instructions are followed.

AEDs and Implantable Devices

Sometimes people may have had a pacemaker implanted if they have a weak heart or a heart that skips beats, or beats too slow or fast. These small implantable devices are sometimes located in the area below the right collarbone. There may be a small lump that can be felt under

the skin. Sometimes the pacemaker is placed somewhere else. Other people may have an implantable cardioverter-defibrillator (ICD), a miniature version of an AED, which acts to automatically recognize and restore abnormal heart rhythms. Sometimes, a victim's heart beats irregularly, even if the victim has a pacemaker or ICD.

If the implanted device is visible or you know that the victim has an implanted device, do not place the defibrillation pad directly over the device (**Fig. 5-3**). This may interfere with the delivery of the shock. Adjust pad placement if necessary and continue to follow the established protocol. If you are not sure, use the AED if needed. It will not harm the victim or rescuer.

Fig. 5-3

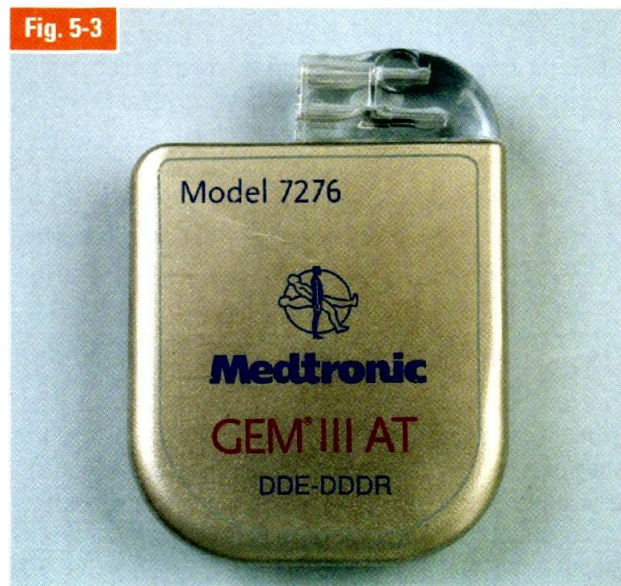
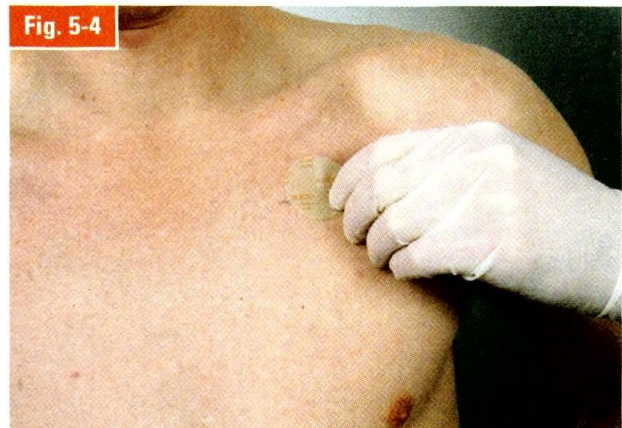


Photo courtesy of Medtronic

Nitroglycerin Patches

People with a history of cardiac problems may have nitroglycerin patches on their chests. Since nitroglycerin can be absorbed by a rescuer, you should remove the patch with a gloved hand before defibrillation. Nicotine patches used to stop smoking look similar to nitroglycerin patches. In order not to waste time trying to identify patches, remove any patch you see on the victim's chest with a gloved hand. (**Fig. 5-4**)

Fig. 5-4



Hypothermia

Some people who have experienced hypothermia have been resuscitated successfully even after prolonged exposure. It will take longer to do your check, or assessment, of a victim suffering from hypothermia because you may have to look for movement and check breathing and a pulse for up to 30 to 45 seconds. If you do not feel a pulse, begin CPR until an AED becomes available. Follow local protocols as to whether an AED should be used. If the victim is wet, dry his or her chest and attach the AED. If a shock is indicated, deliver a shock and follow the instructions of the AED. If there is no obvious sign of life, continue CPR. Continue CPR and protect the victim from further heat loss. Wet garments should be removed, if possible. The victim should not be defibrillated in water. CPR or defibrillation should not be withheld to rewarm the victim. Rescuers should take care not to shake a hypothermia victim unnecessarily, as this could result in V-fib.

Trauma

If a victim is in cardiac arrest resulting from traumatic injuries, an AED may still be used. Defibrillation should be administered according to local protocols.

Chest Hair

Some men have lots of hair on their chest, which can make getting a good pad-to-skin contact difficult. Since time to first shock is critical, attach the pads and analyze as soon as possible. Press firmly on the pads to attach them to the victim's chest. If you get a "check pads" message from the AED, remove the pads and replace with new ones. The pad adhesive will pull out some of the chest hair, which may solve the problem. If you continue to get the "check pads" message, remove the pads, shave the victim's chest and attach new pads to the victim's chest. A safety surgical razor should be included in the AED kit. Be careful not to cut the victim while shaving.

AED MAINTENANCE

For defibrillators to perform optimally, they must be maintained like any other machine. AEDs require minimal maintenance. These devices have various self-testing

features. However, it is important that operators be familiar with any visual or audible prompts the AED may have to warn of malfunction or a low battery. It is important that you read the operator's manual thoroughly and check with the manufacturer to obtain all necessary information regarding maintenance.

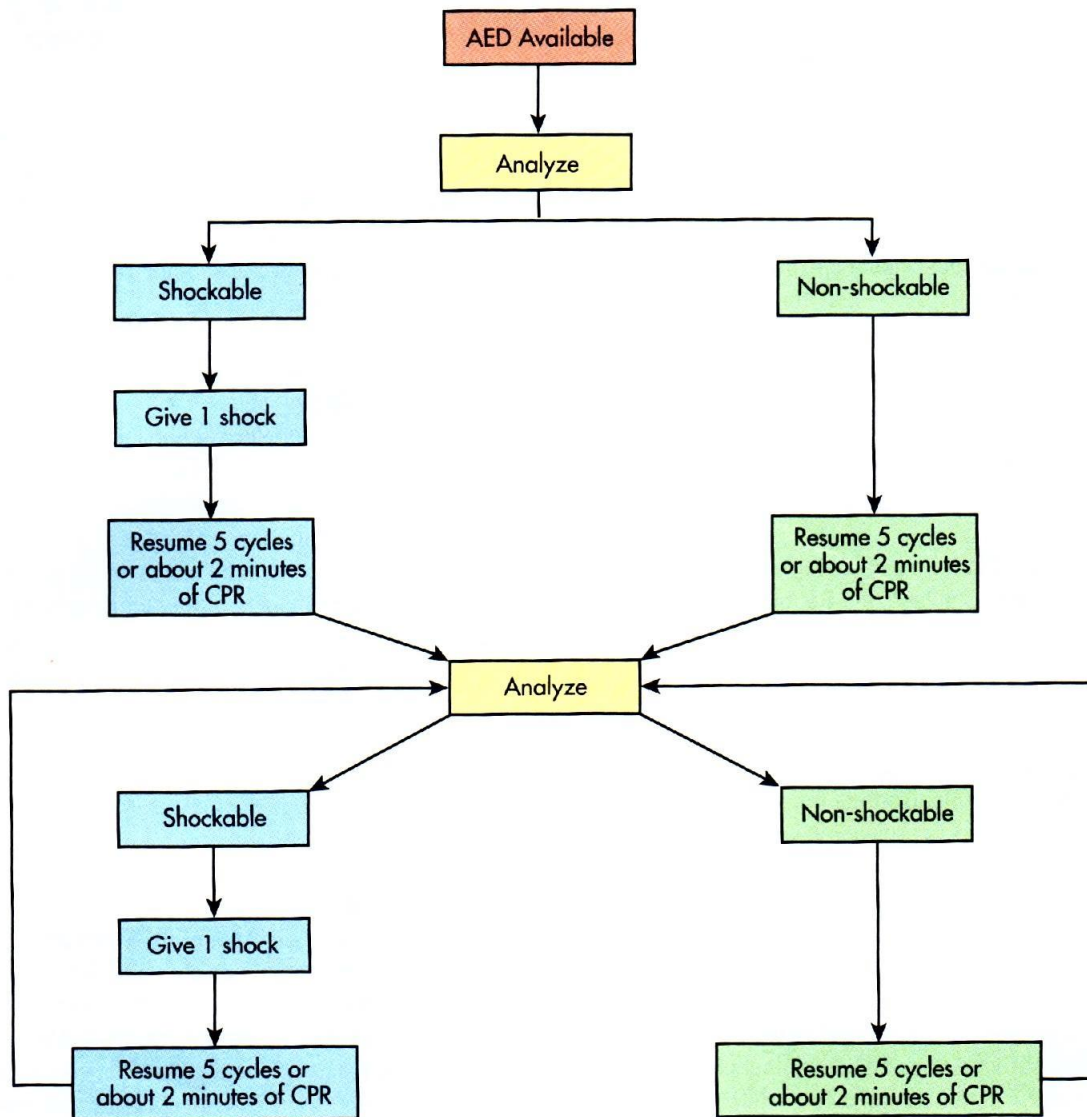
In most instances, if the machine detects any malfunction, you should contact the manufacturer. The device may need to be returned to the manufacturer for service. While AEDs require minimal maintenance, it is important to remember the following:

- Follow the manufacturer's specific recommendations for periodic equipment checks.
- Make sure that the batteries have enough energy for one complete rescue. (A fully charged backup battery should be readily available.)
- Make sure that the correct defibrillator pads are in the package and are properly sealed.
- Check any expiration dates on defibrillation pads and batteries and replace as necessary.
- After use, make sure that all accessories are replaced and that the machine is in proper working order.
- If at any time the machine fails to work properly or warning indicators are recognized, discontinue use and contact the manufacturer immediately.

PUTTING IT ALL TOGETHER

The heart's electrical system controls the pumping action of the heart. Damage to the heart from disease or injury can disrupt the heart's electrical system, resulting in an abnormal heart rhythm that can stop circulation. The two most common treatable abnormal rhythms initially present in sudden cardiac arrest victims are V-fib and V-tach. An AED is a device that provides an electrical shock to the heart, called defibrillation. Defibrillation disrupts the electrical activity of V-fib and V-tach long enough to allow the heart to spontaneously develop an effective rhythm on its own. The sooner the shock is administered, the greater the likelihood of the victim's survival. When using an AED follow your local protocols and be aware of the AED precautions and special situations.

AED Algorithm for the Professional Rescuer



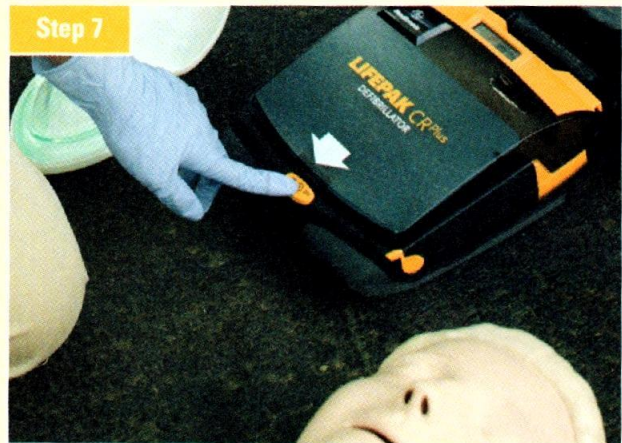
Note: As long as there is no obvious sign of life and the AED still indicates a need to shock, continue repeating sets of 1 shock to the maximum your local protocols allow, with 5 cycles (about 2 minutes) of CPR between each set. Also, as long as there is no obvious sign of life and the AED indicates that no shock is advised, you should still continue to give 5 cycles (about 2 minutes) of CPR before the AED reanalyzes. Be thoroughly familiar with your local protocols, which may vary from this example.

Skill Sheet | Using an AED—Adult and Child

Complete Steps 1-6, Initial Assessment Skill Sheet, pages 28-30.

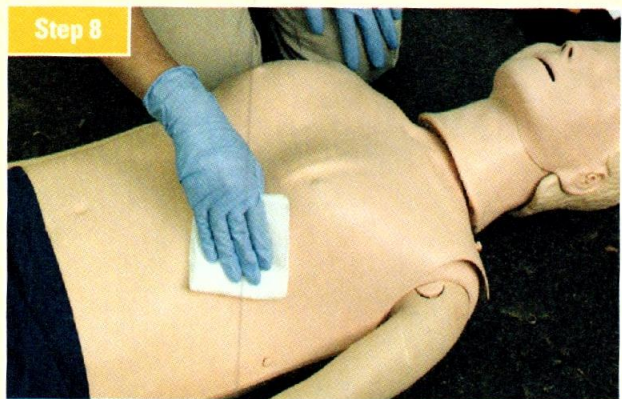
STEP 7

Turn on the AED.



STEP 8

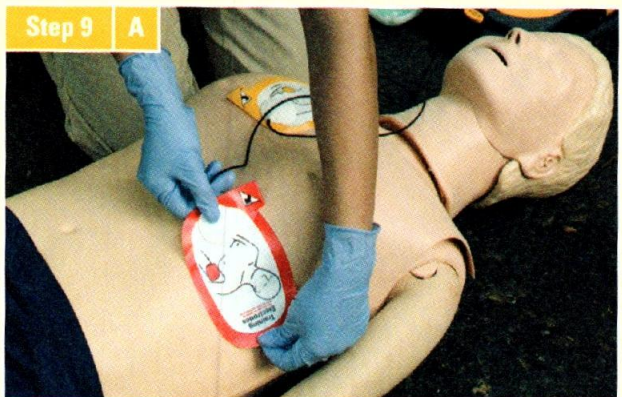
Wipe the chest dry.



STEP 9

Attach the pads.

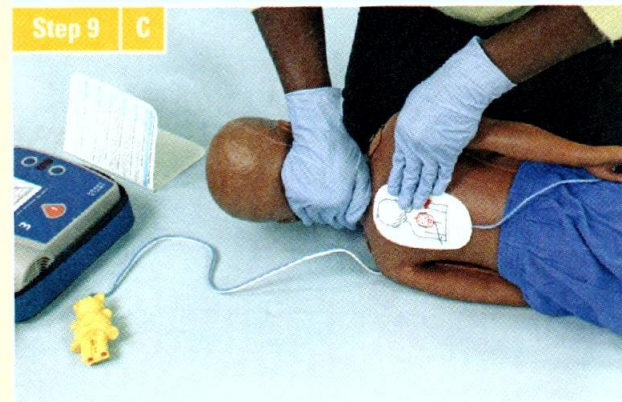
- Place one pad on the victim's upper right chest.
- Place the other pad on the victim's lower left side (A).
- **For a child**, use pediatric AED pads if available. Make sure the pads are not touching.



Continued

Skill Sheet | Using an AED—Adult and Child—cont'd

- If the pads risk touching each other on a child, place one pad on the child's chest and the other pad on the child's back (between the shoulder blades) (B,C).



STEP 10

Plug the connector into the AED, if necessary.



STEP 11

Make sure that nobody, including you, is touching the victim.

- Look to see that nobody is touching the victim.
- Tell everyone to “stand clear.”

STEP 12

Push the “analyze” button, if necessary. Let the AED analyze the heart rhythm.

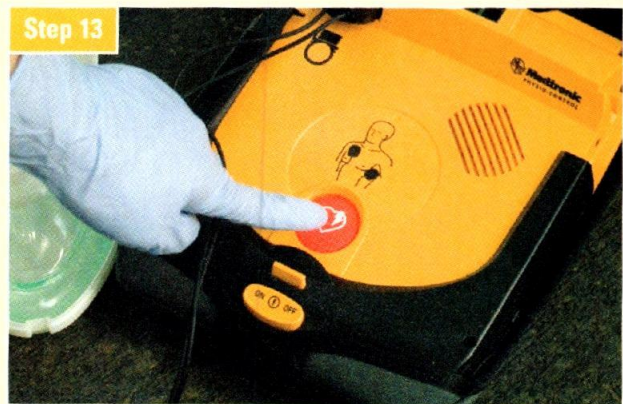
STEP 13

If a shock is advised, push the “shock” button.

- Look to see that nobody is touching the victim.
- Tell everyone to “stand clear.”

A. After the shock or if no shock is indicated—

- Give 5 cycles (about 2 minutes) of CPR before analyzing the heart rhythm again.
- If at any time you notice an obvious sign of life, stop CPR and monitor the ABCs. Administer emergency oxygen, if it is available and you are trained to do so.



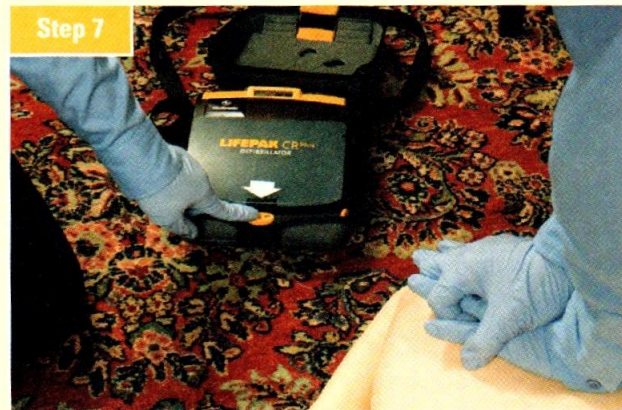
Skill Sheet | Using an AED—Adult and Child, CPR in Progress

Rescuer 1 completes Steps 1-6, Initial Assessment Skill Sheet, pages 28-30, and begins CPR until Rescuer 2 arrives with an AED and the AED is ready to use.

Rescuer 2 completes steps 7-13 below.

STEP 7

Turn on the AED.



STEP 8

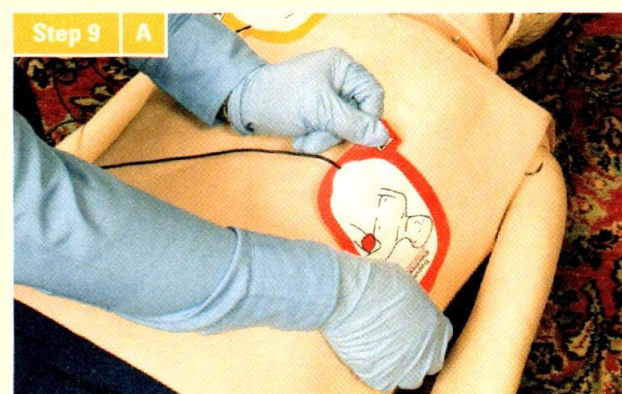
Wipe the chest dry.



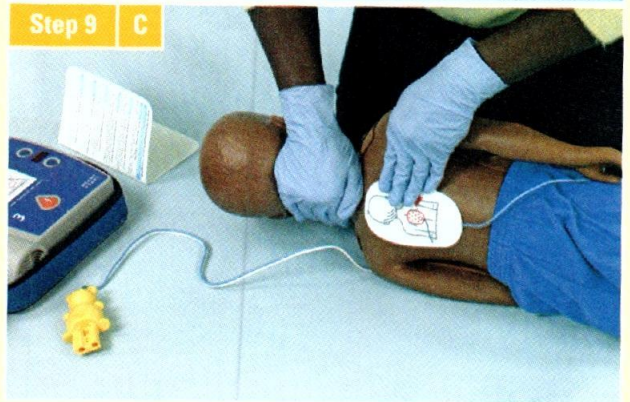
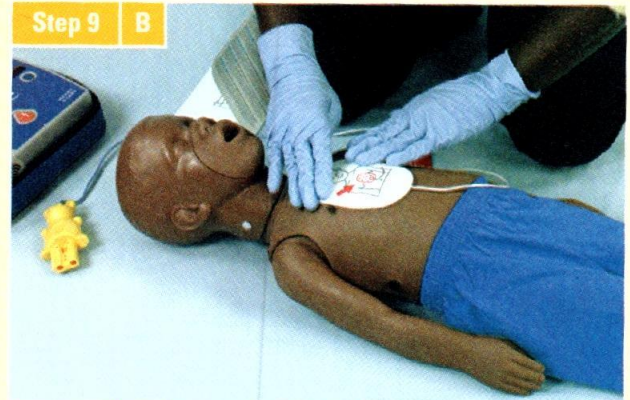
STEP 9

Attach the pads.

- Place one pad on the victim's upper right chest (A).
- Place the other pad on the victim's lower left side.
- **For a child**, use pediatric AED pads if available. Make sure the pads are not touching.



- If the pads risk touching each other on a child, place one pad on the child's chest and the other pad on the child's back (between the shoulder blades) (B,C).



STEP 10

Plug the connector into the AED, if necessary.



Skill Sheet | Using an AED—Adult and Child, CPR in Progress—cont'd

STEP 11

Make sure that nobody, including you, is touching the victim.

- Look to see that nobody is touching the victim.
- Tell everyone to “stand clear.”

STEP 12

Push the “analyze” button, if necessary. Let the AED analyze the heart rhythm.

STEP 13

If a shock is advised, push the “shock” button.

- Look to see that nobody is touching the victim.
- Tell everyone to “stand clear.”

A. After the shock or if no shock is indicated—

- **Rescuer 1** gives 5 cycles (about 2 minutes) of CPR before analyzing the heart rhythm again.
- If at any time you notice an obvious sign of life, stop CPR and monitor the ABCs. Administer emergency oxygen, if it is available and you are trained to do so.



Administering Emergency Oxygen

WOULD YOU KNOW WHAT TO DO?

A 45-year-old man is having difficulty breathing and complains of shortness of breath. He says it started about 30 minutes ago. His breathing has become labored, and he is gasping for breath. You recognize he has a serious condition. How would you respond? Would you know what to do?



In this situation, professional rescuers should use emergency oxygen to help the victim. By using emergency oxygen, you can give care to injured or ill victims until more advanced medical personnel arrive and take over. Oxygen helps victims of respiratory distress and should be used when caring for victims of respiratory arrest as well.

EMERGENCY OXYGEN

When someone has a breathing emergency or cardiac emergency, the supply of oxygen to his or her brain, heart and blood cells is reduced, resulting in *hypoxia*. Hypoxia is a condition in which insufficient oxygen reaches the cells. Signs and symptoms of hypoxia include increased breathing and heart rates, changes in consciousness, restlessness, chest pain and *cyanosis* (bluish lips and nail beds). If breathing stops (respiratory arrest), the brain and heart will soon be starved of oxygen, resulting in cardiac arrest and then death.

The air you normally breathe is about 21 percent oxygen. When you give rescue breaths or provide CPR, the air you exhale into the victim is about 16 percent oxygen. This may not be enough oxygen to save the victim's life. By administering emergency oxygen (Fig. 6-1), you can deliver a higher percentage of oxygen.

Emergency oxygen can be given for just about any breathing or cardiac emergency. If a person is breathing but has no obvious signs or symptoms of injury or illness, emergency oxygen should be considered if—

- An adult is breathing fewer than 12 breaths per minute or more than 20 breaths per minute.
- A child is breathing fewer than 15 breaths per minute or more than 30 breaths per minute.

- An infant is breathing fewer than 25 breaths per minute or more than 50 breaths per minute.

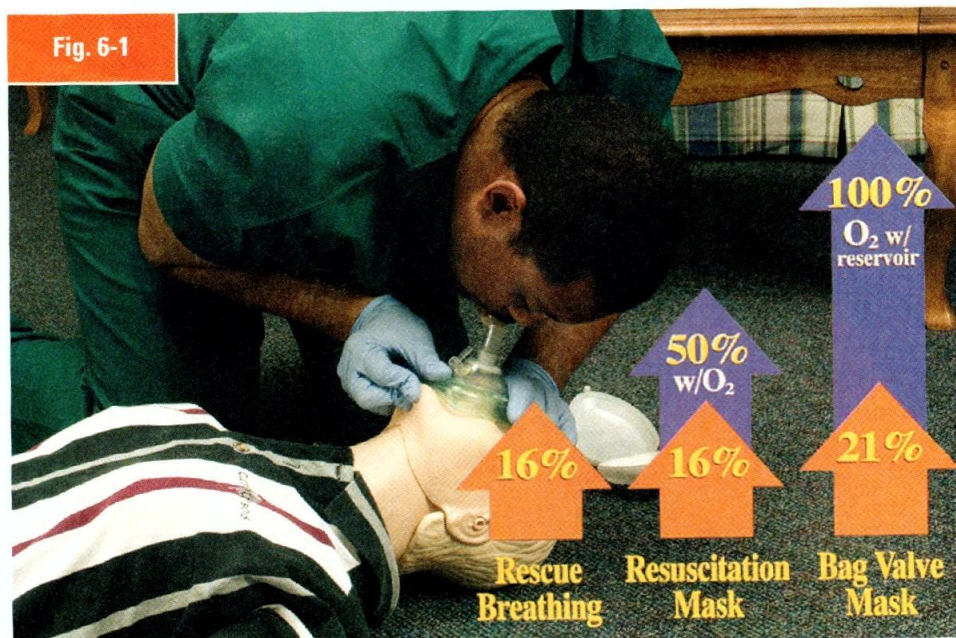
Oxygen should be delivered with properly sized equipment for the respective victims and appropriate flow rates for the delivery device.

Variable-Flow-Rate Oxygen

Many EMS systems use variable-flow-rate oxygen. Variable-flow-rate oxygen systems allow the rescuer to vary the flow of oxygen. Because of the large amount of oxygen EMS systems deliver and the variety of equipment and emergency situations they respond to, variable-flow-rate oxygen is practical. To deliver variable-flow-rate emergency oxygen, the following pieces of equipment need to be assembled:

- An oxygen cylinder
- A regulator with pressure gauge and flowmeter
- A delivery device

Emergency oxygen units are available without prescription for first aid use, provided they contain at least a 15-minute supply of oxygen, and that they are designed to deliver a preset flow rate of at least 6 LPM. Oxygen cylinders are labeled "U.S.P." and marked with a yellow diamond that says "Oxygen" (Fig. 6-2, A). The U.S.P. stands for United States Pharmacopeia and indicates the oxygen is medical grade. Oxygen cylinders come in different sizes and have various pressure capacities. In the United States, oxygen cylinders typically have green markings. However, the color scheme is not regulated, so different manufacturers and other countries may use different color markings. Oxygen cylinders are under

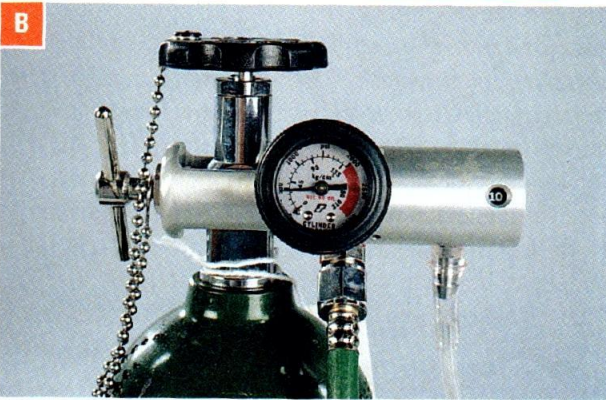


high pressure and should be handled carefully. The regulator lowers the pressure coming out of the cylinder so that the oxygen can be used safely (Fig. 6-2, B). The regulator also has a pressure gauge that shows the pressure in the cylinder. The pressure gauge shows if the cylinder is full (2,000 pounds per square inch [psi]), nearly empty or in between. The regulator must be carefully attached to the oxygen cylinder. An "O-ring" gasket makes the seal tight (Fig. 6-2, C). The flowmeter controls how rapidly the oxygen flows from the cylinder to the victim. Oxygen flow is measured in liters per minute (LPM). The flow can be set from 1 to 25 LPM. For details on how to assemble and deliver variable-flow oxygen, refer to the Oxygen Delivery, pages 81-84.

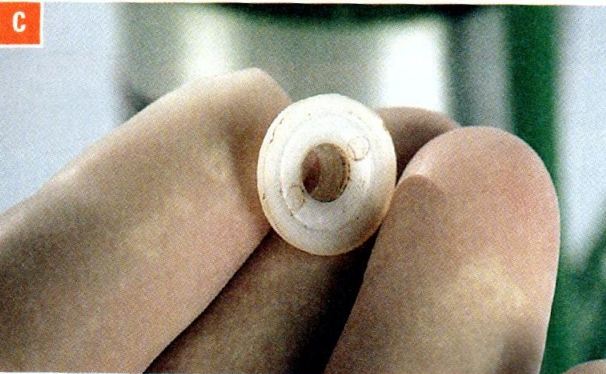
Fig. 6-2 A



B



C



Fixed-Flow-Rate Oxygen

Some emergency oxygen systems have the regulator set at a fixed-flow rate. The flow rate is set at 6 LPM, 12 LPM or another rate. In some cases, the fixed-flow-rate systems may have a dual (high/low) flow setting. Fixed-flow-rate oxygen systems typically come with the delivery device, regulator and cylinder already connected to each other (Fig. 6-3). This eliminates the need to assemble the equipment, which makes it quick and very simple to deliver emergency oxygen.

To operate this type of device, the rescuer simply turns it on, checks that oxygen is flowing and places the mask over the victim's face. The drawback to using fixed-flow-rate oxygen systems is that you cannot adjust the flow rate to different levels. This limits both the type of delivery device you can use and the concentration of oxygen you can deliver. A fixed-flow-rate unit with a preset flow of 6 LPM can be used with a nasal cannula or resuscitation mask. With a preset flow rate of 12 LPM, the unit can be used with a resuscitation mask or non-rebreather.

Because of the simplicity of the preconnected fixed-flow-rate systems and the lifesaving benefits of oxygen, these systems are becoming increasingly popular in the workplace, schools and other places where professional rescuers may have to respond to on-site emergencies.

Fig. 6-3



Oxygen Safety Precautions

When preparing and administering oxygen, safety is a concern. Use emergency oxygen equipment according to the manufacturer's instructions and in a manner consistent with federal and local regulations. Also follow these recommended guidelines:

- Be sure that oxygen is flowing before putting the delivery device over the victim's face.
- Do not use oxygen around flames or sparks. Oxygen causes fire to burn more rapidly.
- Do not use grease, oil or petroleum products to lubricate or clean the regulator. This could cause an explosion.
- Do not stand oxygen cylinders upright unless they are well secured. If the cylinder falls, the regulator or valve could become damaged or cause injury.
- Do not drag or roll cylinders.
- Do not carry a cylinder by the valve or regulator.
- Do not hold on to protective valve caps or guards when moving or lifting cylinders.
- Do not deface, alter or remove any labeling or markings on the oxygen cylinder.
- Do not attempt to mix gases in an oxygen cylinder or transfer oxygen from one cylinder to another.

If defibrillating, make sure that no one is touching or in contact with the victim or the resuscitation equipment. Do not defibrillate someone when around flammable materials, such as gasoline or free-flowing oxygen.

Appropriate sizing is important to ensure adequate airway management.

Nasal Cannulas

A nasal cannula delivers oxygen to someone who is breathing (Fig. 6-4). It has two small prongs that are inserted into the nose. Nasal cannulas are not used often in an emergency because they do not give as much oxygen as a resuscitation mask, non-rebreather mask or a BVM. They are used mostly for victims with minor breathing problems rather than for life-threatening conditions. If a victim will not accept having a mask on his or her face, a nasal cannula can be used. With a nasal cannula, set the flow rate at 1-6 LPM.



Fig. 6-4

OXYGEN DELIVERY DEVICES

An oxygen delivery device is the piece of equipment a victim breathes through when receiving emergency oxygen. Tubing carries the oxygen from the regulator to the delivery device on the victim's face (Table 6-1). These devices include nasal cannulas, resuscitation masks, non-rebreather masks and bag-valve-mask resuscitators (BVMs). Various sizes of masks, BVMs and nasal cannulas are available for adults, children and infants.

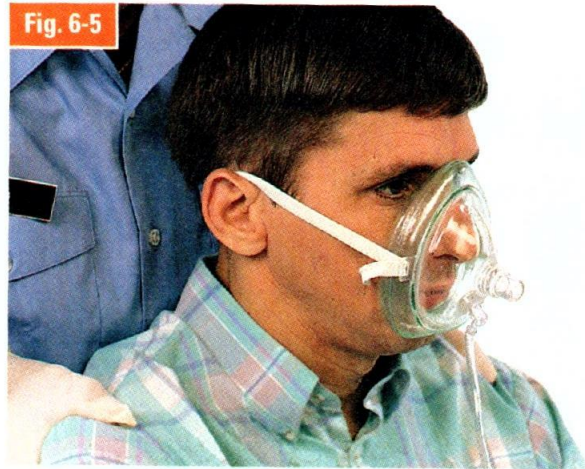
Resuscitation Masks

A resuscitation mask with an oxygen inlet can be used with emergency oxygen to give rescue breaths to a nonbreathing victim. It also can be used for someone who is breathing, but still needs emergency oxygen. Some resuscitation masks come with elastic straps to put over the victim's head to keep the mask in place (Fig. 6-5). If the mask does not have a strap, you or the victim can hold it in place. With a resuscitation mask, set the flow rate at 6-15 LPM. For additional information

TABLE 6-1 OXYGEN DELIVERY DEVICES

Delivery Device	Common Flow Rate	Oxygen Concentration	Function
Nasal Cannula	1-6 LPM	24-44 percent	Breathing victims only
Resuscitation Mask	6-15 LPM	35-55 percent	Breathing and nonbreathing victims
Non-Rebreather Mask	10-15 LPM	90+ percent	Breathing victims only
BVM	15+ LPM	90+ percent	Breathing and nonbreathing victims

on using a resuscitation mask, refer to the Using a Resuscitation Mask for Rescue Breathing Skill Sheet, pages 78-80.



Non-Rebreather Masks

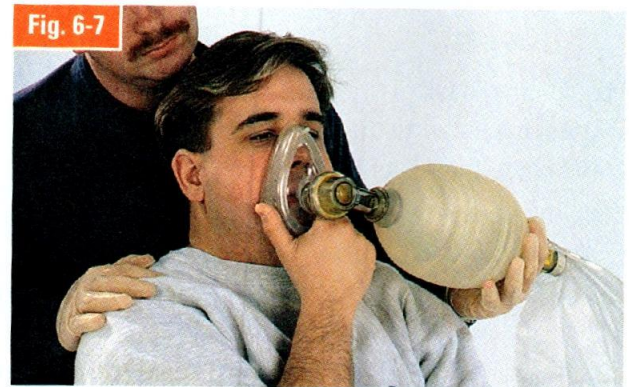
A non-rebreather mask (Fig. 6-6) is an effective method for delivering high concentrations of oxygen to breathing victims. The non-rebreather mask consists of a face mask with an attached oxygen reservoir bag and a one-way valve between the mask and bag to prevent the victim's exhaled air from mixing with the oxygen in the reservoir bag. The victim inhales oxygen from the bag and exhaled air escapes through flutter valves on the side of the mask. The reservoir bag should be inflated by covering the one-way valve with your thumb before placing it on the victim's face. The oxygen reservoir bag should be sufficiently inflated (about $\frac{2}{3}$ full) so as not to deflate when the victim inhales. If it begins to deflate, increase the flow rate of the oxygen to refill the reservoir bag. With non-rebreather masks, the flow rate should be set at 10-15 LPM. When using the non-rebreather mask with a high flow rate of oxygen, up to 90 percent or more oxygen can be delivered to the victim. Because young children and infants may be frightened by a mask being



placed on their faces, consider a "blow-by" technique. The rescuer, parent or guardian should hold a non-rebreather mask approximately 2 inches from the child's or infant's face. This will allow the oxygen to pass over the face and be inhaled.

Bag-Valve-Mask Resuscitators

A BVM can be used on a person who is breathing or not breathing. By using a BVM with emergency oxygen attached to an oxygen reservoir bag, you can deliver up to 100 percent oxygen to the victim (Fig. 6-7). The BVM can be held by a breathing victim to inhale the oxygen or you can squeeze the bag as the victim inhales to help deliver more oxygen. If you use a BVM without emergency oxygen, the nonbreathing victim receives 21 percent oxygen—the amount in the air. With a BVM, the flow rate should be set at 15 LPM or more.



PUTTING IT ALL TOGETHER

Administering emergency oxygen to the victim of a cardiac or breathing emergency can help improve the hypoxia. It also helps reduce the pain and breathing discomfort caused by hypoxia. Variable-flow-rate oxygen systems allow the rescuer to vary the concentration of oxygen and the type of delivery device used. Preconnected fixed-flow-rate systems eliminate the need to assemble the equipment, which makes it quick and very simple to deliver emergency oxygen. When using emergency oxygen, follow safety precautions and use the equipment according to the manufacturer's instructions. An oxygen delivery device is the piece of equipment a victim breathes through when receiving emergency oxygen. These delivery devices include nasal cannulas, resuscitation masks, non-rebreather masks and BVMs. Be familiar with the unique features and benefits of these devices as well as their appropriate flow rates and situations in which they should be used.

Skill Sheet | Using A Resuscitation Mask for Rescue Breathing

STEP 1

Assemble the mask.

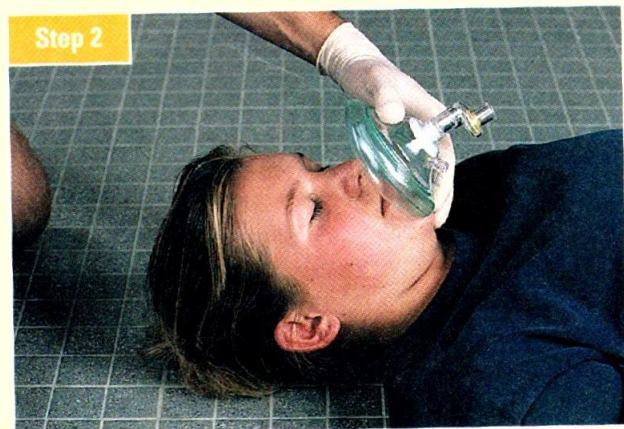
- Attach the one-way valve to the resuscitation mask.



STEP 2

Position the mask.

- Kneel behind or to the side of the victim's head and place the rim of the mask between the lower lip and chin. Lower the resuscitation mask until it covers the victim's mouth and nose.

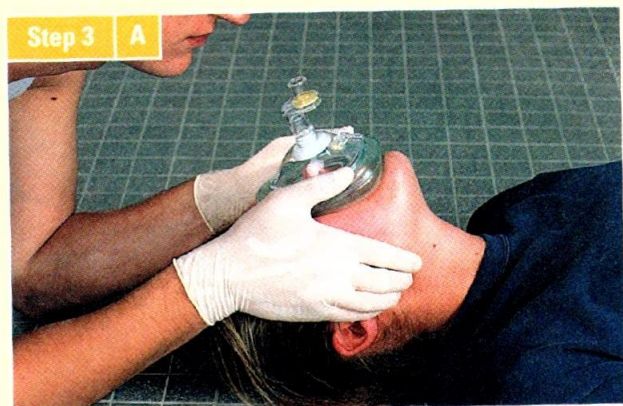


STEP 3

Seal the mask and open the victim's airway.

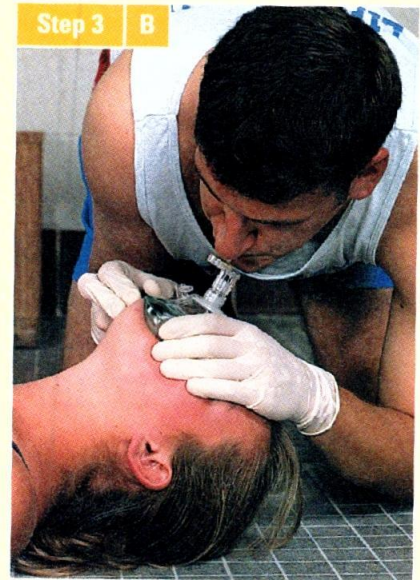
A. From the back of the victim's head—

- Place your thumbs along each side of the resuscitation mask.
- Slide your fingers into position behind the angles of the victim's jawbone.
- Apply downward pressure with your thumbs.
- Lift the jaw and tilt the head back to open the airway.



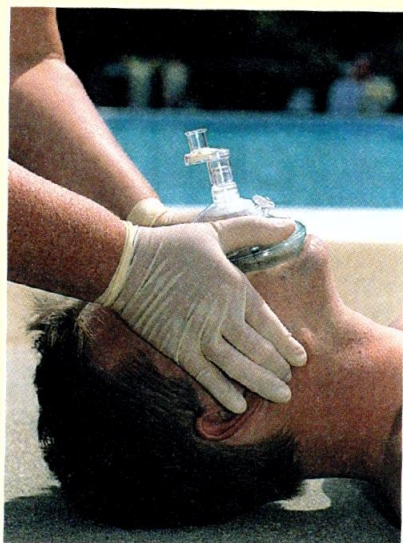
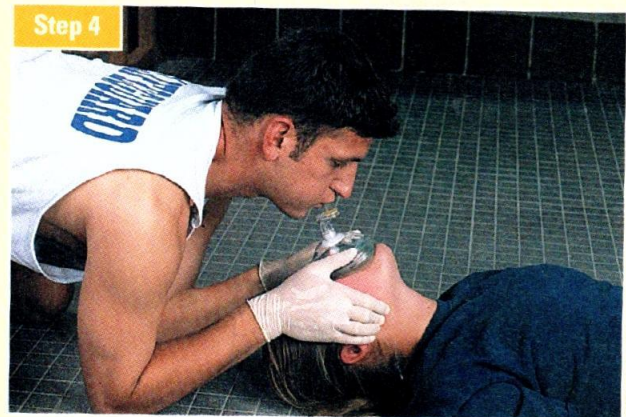
B. From the side of the victim's head—

- With your top hand, place your thumb and fingers around the top of the resuscitation mask.
- With your other hand, slide your first two fingers into position on the bony part of the victim's chin.
- Apply downward pressure with your top hand and the thumb of your lower hand to seal the top and bottom of the resuscitation mask.
- Lift the chin and tilt the head back to open the airway.

**STEP 4**

Check for a pulse. If there is a pulse, but no movement or breathing, begin rescue breathing.

- Give 1 rescue breath about every 5 seconds for an adult and 1 rescue breath about every 3 seconds for a child or infant.
- Watch the victim's chest clearly rise with each rescue breath.

**What to Do—****If you suspect the victim may have a head, neck or back injury—**

Try the jaw-thrust maneuver to open the airway.

- Position the mask.
- Place your thumbs along each side of the resuscitation mask.
- Slide your fingers into position behind the angles of the victim's jawbone.
- Without moving the victim's head, apply downward pressure with your thumbs and lift the jaw to open the airway.
- If the jaw-thrust maneuver does not open the airway, use the head-tilt/chin-lift technique to open the airway.

Skill Sheet | Using A Resuscitation Mask for Rescue Breathing—cont'd

If using an adult resuscitation mask on an infant:

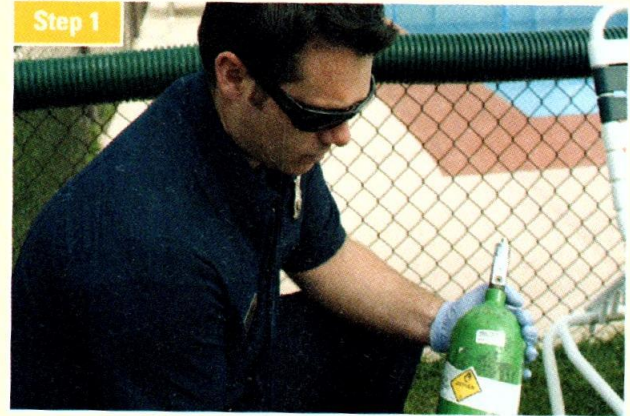
- Kneel behind the infant's head.
- Rotate the mask and position the nose of the mask on the infant's chin.
- Lower the wide end of the mask to cover the infant's mouth and nose.
- Place your thumbs along either side of the rim and slide your fingers into position behind the angles of the infant's jawbone.
- Seal the mask by applying downward pressure with your thumbs.
- Lift the jaw and tilt the head to a neutral position to open the airway.

Note: Not all adult resuscitation masks require the rescuer to rotate the mask to create an adequate seal for an infant. If you are using a pediatric mask, you do not need to rotate the mask. Pediatric masks are specifically designed to fit a child or infant. Seal the pediatric mask and give rescue breaths in the same manner you learned for an adult.

Skill Sheet | Oxygen Delivery

STEP 1

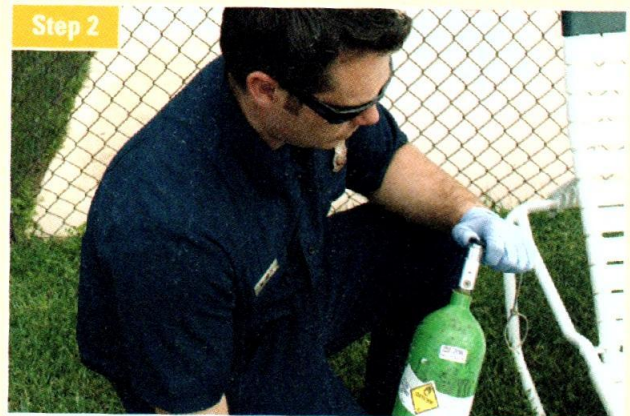
Make sure the oxygen cylinder is labeled "U.S.P." and marked with a yellow diamond that says "Oxygen."



STEP 2

Clear the valve.

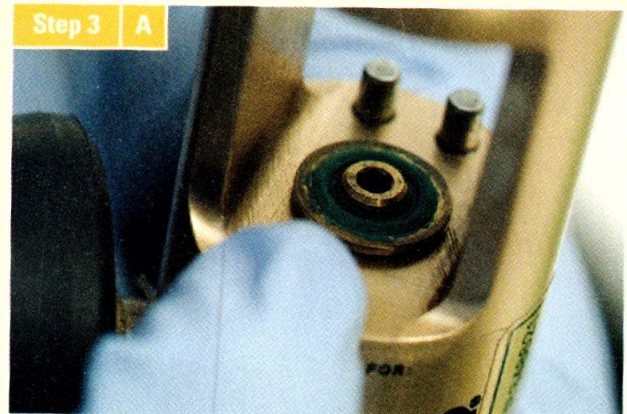
- Remove the protective covering and save the O-ring gasket.
- Turn the cylinder away from you and others before opening.
- Open the cylinder valve for 1 second to clear the valve.



STEP 3

Attach the regulator.

- Put the O-ring gasket into the valve on top of the cylinder, if necessary (A).

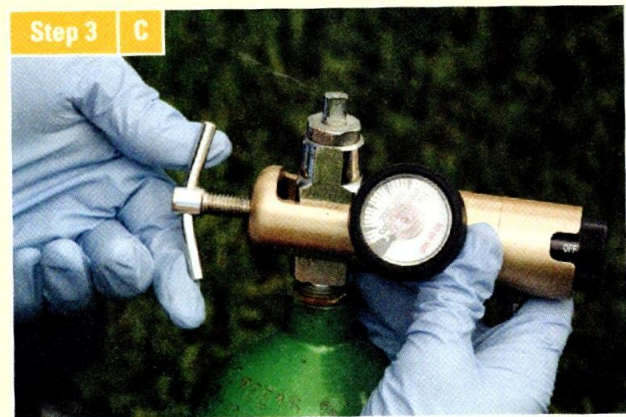


Skill Sheet | Oxygen Delivery—cont'd

- Make sure that it is marked "Oxygen Regulator" (B).



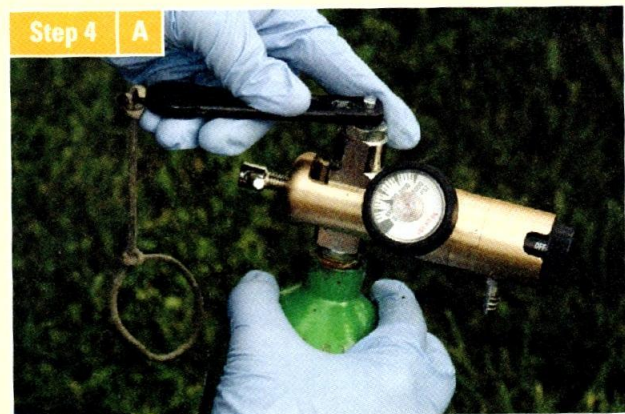
- Secure the regulator on the cylinder by placing the three metal prongs into the valve.
- Hand-tighten the screw until the regulator is snug (C).



STEP 4

Open the cylinder one full turn (A).

- Check the pressure gauge.



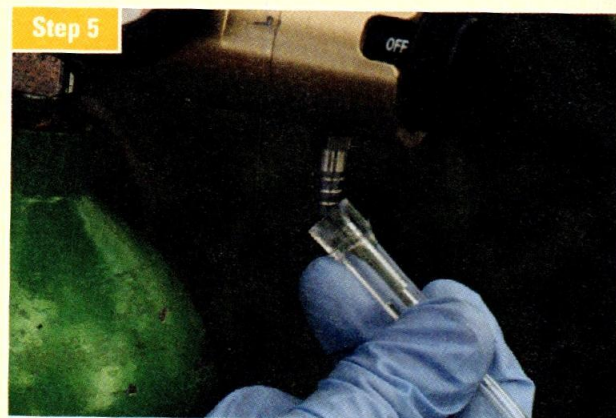
- Determine that the cylinder has enough pressure (B).



STEP 5

Attach the delivery device.

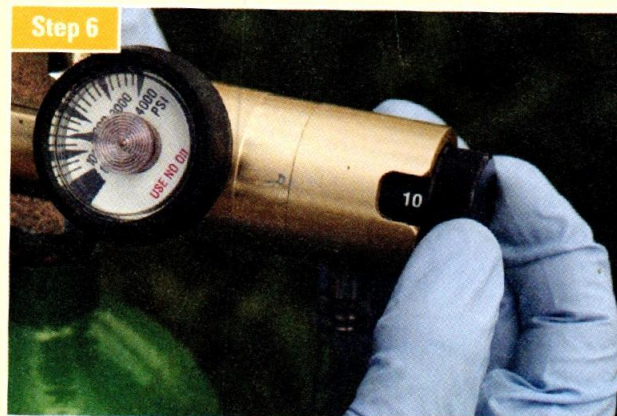
- Attach the plastic tubing between the flowmeter and the delivery device.



STEP 6

Adjust the flowmeter.

- Turn the flowmeter to the desired flow rate.
- With a nasal cannula, set the rate at 1-6 LPM.
- With a resuscitation mask, set the rate at 6-15 LPM.
- With a non-rebreather mask, set the rate at 10-15 LPM.
 - Ensure that the oxygen reservoir bag is inflated by placing your thumb over the one-way valve in the bottom of the mask until the bag is sufficiently inflated.
- With a BVM, set the rate at 15 LPM or more.



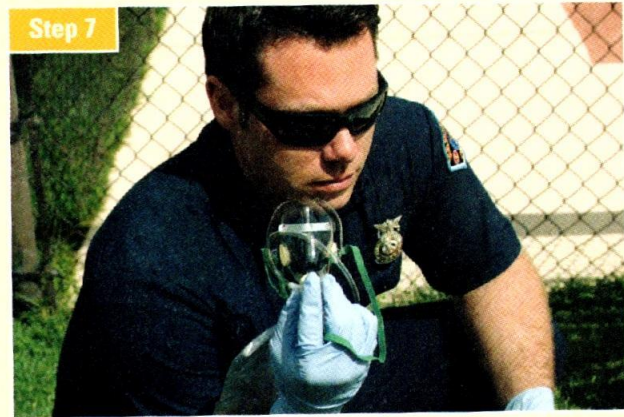
Continued

Skill Sheet | Oxygen Delivery—cont'd

STEP 7

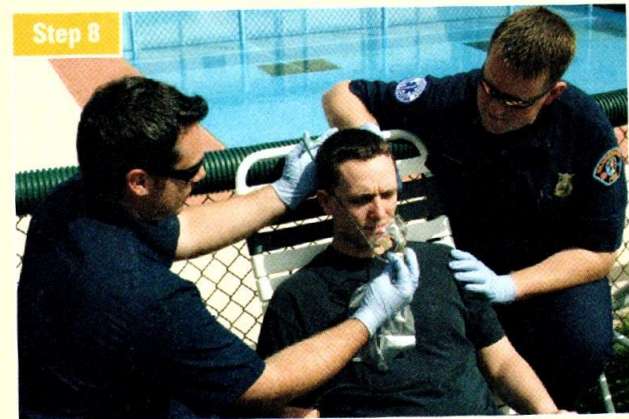
Verify the oxygen flow.

- Listen and feel for oxygen flow through the delivery device.



STEP 8

Place the delivery device on the victim and continue care until more advanced medical personnel arrive and take over.



Appendix A

HEALTH PRECAUTIONS AND GUIDELINES DURING TRAINING

The American Red Cross has trained millions of people in first aid and cardiopulmonary resuscitation (CPR) using manikins as training aids.

The Red Cross follows widely accepted guidelines for cleaning and decontaminating training manikins. **If these guidelines are adhered to, the risk of any kind of disease transmission during training is extremely low.**

To help minimize the risk of disease transmission, you should follow some basic health precautions and guidelines while participating in training. You should take precautions if you have a condition that would increase your risk or other participants' risk of exposure to infections. Request a separate training manikin if you—

- Have an acute condition, such as a cold, a sore throat or cuts or sores on the hands or around your mouth.
- Know you are seropositive (have had a positive blood test) for hepatitis B surface antigen (HBsAg), indicating that you are currently infected with the hepatitis B virus.*
- Know you have a chronic infection indicated by long-term seropositivity (long-term positive blood tests) for the hepatitis B surface antigen (HBsAg)* or a positive blood test for anti-human immunodeficiency virus (HIV) (that is, a positive test for antibodies to HIV, the virus that causes many severe infections including acquired immunodeficiency syndrome [AIDS]).
- Have had a positive blood test for hepatitis C.
- Have a condition that makes you unusually likely to get an infection.

* A person with a hepatitis B infection will test positive for the HBsAg. Most people infected with hepatitis B will get better within a period of time. However, in some people hepatitis B infections will become chronic and will linger for much longer. These people will continue to test positive for HBsAg. Their decision to participate in CPR training should be guided by their physician. After a person has had an acute hepatitis B infection, he or she will no longer test positive for the surface antigen but will test positive for the hepatitis B antibody (anti-HBs). People who have been vaccinated for hepatitis B will also test positive for the hepatitis antibody. A positive test for anti-HBs should not be confused with a positive test for HBsAg.

To obtain information about testing for individual health status, visit the CDC Web site at www.cdc.gov/ncidod/diseases/hepatitis/c/faq.htm

If you decide you should have your own manikin, ask your instructor if he or she can provide one for you to use. You will not be asked to explain why in your request. The manikin will not be used by anyone else until it has been cleaned according to the recommended end-of-class decontamination procedures. Because the number of manikins available for class use is limited, the more advance notice you give, the more likely it is that you can be provided a separate manikin.

Guidelines

In addition to taking the precautions regarding manikins, you can further protect yourself and other participants from infection by following these guidelines:

- Wash your hands thoroughly before participating in class activities.
- Do not eat, drink, use tobacco products or chew gum during class.
- Clean the manikin properly before use.
 - For some manikins, this means vigorously wiping the manikin's face and the inside of its mouth with a clean gauze pad soaked with either a fresh solution of liquid chlorine bleach and water (¼ cup sodium hypochlorite per gallon of tap water) or rubbing alcohol. The surfaces should remain wet for at least 1 minute before they are wiped dry with a second piece of clean, absorbent material.
 - For other manikins, it means changing the manikin's face. Your instructor will provide you with instructions for cleaning the type of manikin used in your class.
- Follow the guidelines from your instructor when practicing skills such as clearing a blocked airway with your finger.

Physical Stress and Injury

Successful course completion requires full participation in classroom and skill sessions, as well as successful performance in skill and knowledge evaluations. You will be participating in strenuous activities, such as performing CPR on the floor. If you have a medical condition or disability that will prevent you from taking part in the skills practice sessions, please let your instructor know so that accommodations can be made. If you are unable to participate fully in the course, you may "audit" the course and participate as much as you can or desire. To audit a course, you must let the instructor know before the training begins. You will *not* be eligible to receive a course completion certificate.

References

2005 International Consensus on CPR and ECC Science with Treatment Recommendations Guidelines 2005 for First Aid, *Circulation*. Volume 112, Issue 22 Supplement; November 29, 2005.

American Heart Association and the American National Red Cross, 2005 Guidelines for First Aid, Supplement to *Circulation*, www.circulationaha.org

The American National Red Cross, *Bloodborne Pathogens Training: Preventing Disease Transmission*. Yardley, PA: StayWell, 2003.

The American National Red Cross, *CPR/AED for the Professional Rescuer*. Yardley, PA: StayWell, 2002.

The American National Red Cross, *Emergency Response*. Yardley, PA: StayWell, 2001.

The American National Red Cross, *First Aid/CPR/AED for Schools and the Community*. Yardley, PA: StayWell, 2006.

The American National Red Cross, *First Aid/CPR/AED for the Workplace Participant's Workbook*. Yardley, PA: StayWell, 2006.

The American National Red Cross. *Lifeguard Training*. Yardley, PA: StayWell, 2001.

The American National Red Cross, *Oxygen Administration*. Yardley, PA: StayWell, 1993.

American Red Cross Advisory Council on First Aid and Safety, (ACFAS). *Advisory Statement on Aspirin Administration*, 2001.

American Red Cross Advisory Council on First Aid and Safety, (ACFAS). *Advisory Statement on Epinephrine Administration*, 2001.

American Red Cross Advisory Council on First Aid and Safety, (ACFAS), *Advisory Statement on Asthma Assistance*, 2003.



MISSION OF THE AMERICAN RED CROSS

The American Red Cross, a humanitarian organization led by volunteers and guided by its Congressional Charter and the Fundamental Principles of the International Red Cross Movement, will provide relief to victims of disaster and help people prevent, prepare for, and respond to emergencies.

ABOUT THE AMERICAN RED CROSS

To support the mission of the American Red Cross, over 1.3 million paid and volunteer staff serve in some 1,600 chapters and blood centers throughout the United States and its territories and on military installations around the world. Supported by the resources of a national organization, they form the largest volunteer service and educational force in the nation. They serve families and communities through blood services, disaster relief and preparedness education, services to military family members in crisis, and health and safety education.

The American Red Cross provides consistent, reliable education and training in injury and illness prevention and emergency care, providing training to nearly 16 million people each year in first aid, CPR, swimming, water safety, and HIV/AIDS education.

All of these essential services are made possible by the voluntary services, blood and tissue donations, and financial support of the American people.

FUNDAMENTAL PRINCIPLES OF THE INTERNATIONAL RED CROSS AND RED CRESCENT MOVEMENT

HUMANITY

IMPARTIALITY

NEUTRALITY

INDEPENDENCE

VOLUNTARY SERVICE

UNITY

UNIVERSALITY

Trained. Empowered. Prepared.

Become an American Red Cross Instructor... And Help Save Lives!



It doesn't take much. A little time. A little caring. A BIG reward.

Your time. Your knowledge. Your experience.

These gifts can help save thousands of lives. How? Each year, the American Red Cross teaches lifesaving skills to nearly 12 million people. But we can't do it alone. Reaching this many people is only possible through the help of people like you. People who care about the safety and lives of others, and are willing to devote a little bit of their time to help us make the world a safer place.

Become certified to teach:

- First Aid/CPR/AED
- CPR/AED for the Professional Rescuer
- Administering Emergency Oxygen
- Bloodborne Pathogens Training
- Emergency Preparedness

Do you have what it takes?

We'll help you build and refine all the skills you need. The American Red Cross offers flexible scheduling and a chance to make a real difference. Work with America's most trusted health and safety training provider and show your community that you care.



**American
Red Cross**

For more information, contact your local American Red Cross chapter, visit www.redcross.org or call (800) 667-2968.

I am trained, empowered and prepared. I am the American Red Cross.

In every community, in every city, the American Red Cross is there because you are.

The American Red Cross CPR/AED for the Professional Rescuer course gives first responders the skills and confidence necessary to save a life. Red Cross training is based on more than 90 years of experience in emergency preparedness and response. And, because the Red Cross works side by side with professional rescuers in emergency situations, we know what it takes to be the best first responder you can be.

Learn the Skills You Need to Act Quickly and Save a Life

American Red Cross training combines discussions and video with hands-on skills training to promote effective learning and keep students motivated. The course is based on real-life rescue scenarios, so you'll be confident in any emergency. You will learn to:

- Respond to breathing and cardiac emergencies in adults, children and infants
- Use an AED on an adult and child victim of cardiac arrest
- Use personal protective equipment to stop bloodborne pathogens and other diseases from spreading

Plus, you can add on optional training in Bloodborne Pathogens, Administering Emergency Oxygen, suctioning, airway management and the use of epinephrine auto-injectors and asthma inhalers.

Through your participation in American Red Cross health and safety programs, you enable the Red Cross to provide lifesaving programs and services within our community. We truly value your support!



The training YOU need to save a life.

CPR/AED for the Professional Rescuer has been updated with the latest science on CPR and emergency cardiovascular care (ECC).

CERTIFICATION ALSO AVAILABLE IN FIRST AID.

Resources for Instructors

A CD-ROM, included with the CPR/AED for the Professional Rescuer Instructor's Manual, helps instructors quickly access customizable teaching tools such as Microsoft PowerPoint™ presentations, review questions and marketing templates including ads and fliers. The CD-ROM also includes dozens of in-service training outlines available to help refresh and expand skills throughout the year.

Plus, Red Cross-certified instructors can benefit from Instructor's Corner, an online resource center available 24/7. Visit the new Red Cross Instructor's Corner at www.redcross.org/instructorscorner today.

StayWell®

A MedMedia USA Company

STOCK NUMBER 652162
ISBN 1-58480-304-5



9 781584 803041



S123