# A STUDY TO DEVELOP A TRAINING MODULE AND LEADER'S GUIDE FOR AN EMERGENCY RESPONSE TEAM AT COMPANY X

by

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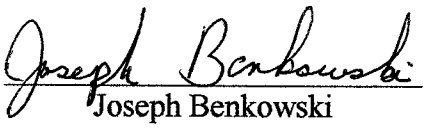
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ABSTRACT

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Company X is currently using an informal training system for its Emergency Response Team training. It conducts its training with no formal schedule and no Leader's guide. Team Advisors on each shift are used to conduct the Emergency Response Team training. Having several individuals delivering the training material indicates a need for a uniform training module, and Leader's guide, for company X's Emergency Response Team training system.

The purpose of this study is to develop a formal training module, including a Leader's guide, for company X's Emergency Response Team.

The members of the Emergency Response Team (ERT) were surveyed about previous emergency response team training and attitudes about company X's current emergency response team training system. The survey tool was a self resort survey created by the researcher. Survey results presented that Emergency Response Team members were dissatisfied with the current training system, and there is the need for more effective training methods for Company X's Emergency Response Team training system. The review of literature illustrated OSHA requirements in training, effective adult training methods, and the components of a Leader's Guide.

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# CHAPTER I

## INTRODUCTION

Having an effectively trained Emergency Response Team is an excellent way for companies to deal with workplace accidents, injuries, and emergencies. There are three areas that need to be addressed when training an Emergency Response Team in an industrial environment. First, training needs to be in compliance with the Occupational Safety and Health Administration. Second, effective training uses effective teaching techniques. Finally, there needs to be a system to assure that training is uniform. A Leader's Guide helps to assure uniformity in training.

In order to protect workers from unsafe working conditions the government passed the Occupational Safety & Health Act of 1970. This Act heralded a new era in the history of the protection of workers from injury or harm on the job. This included job related death, injury, and illness. (U.S. Department of Labor, 2003) The Occupational Safety & Health Administration (OSHA) is an agency of the United States government, established April 28, 1971, to set industry standards for employee health and safety. The standards set by OSHA are laws set in place to assure employers are providing a safe work environment. OSHA also sets standards for minimum requirements in training. OSHA's regulations and requirements apply to every work environment, in every industry, throughout the United States.

"Employers should establish effective safety and health programs and prepare their workers to handle emergencies before they arise." (U.S. Department of Labor, 2003) A work place emergency is an unforeseen situation that threatens employees, customers,

or the public; disrupts or shuts down your operation; or causes physical or environmental damages. (U.S. Department of Labor, 2003)

Occupational Safety & Health Administration (OSHA) actually requires firms of more than ten employees to have a written emergency action plan.

To assure that an emergency action plan is effective employees must have effective and frequent training. Effective training involves using appropriate training methods and teaching techniques, and delivering and repeating course materials at appropriate intervals.

All members of the Emergency Response Team should receive the same level of training. In order to provide continuity a Leader's Guide should be developed so that all training is uniform regardless of who is presenting the material.

This research focuses on developing a training module, including a Leader's Guide, for an Emergency Response Team at Company X, an infant formula manufacturer in Eau Claire, WI. The Emergency Response Team at Company X has forty employees, comprised of maintenance personal, calibration technicians, Team Advisors, Engineers, and the Safety Manager. Line operators and other employees do not have the option of participating in the Emergency Response Team at this time.

The Emergency Response Team training at Company X currently lacks structure, and has no formal scheduled. According to the Safety Manager at Company X, there is a need to develop a uniform training module, including a Leader's Guide, for the Emergency Response Team at Company X.

The training module and Leader's Guide should include all areas of training at Company X, which are First Aid/ CPR, Confined Space Entry, Chemical Hazards,

Systems and Alarms, and the importance of Lockout/ Tagout procedures in an emergency.

*Statement of the Problem*

Company X currently uses an informal training system, which lacks structure, for its Emergency Response Team training. The current training system is conducted with no formal training schedule and no Leader's Guide. Because employee safety is of utmost importance, a consistent and formal training module, including a leader's guide, needs to be developed to provide uniformity for company X's Emergency Response Team training.

*Purpose of the Study*

The purpose of the study is to obtain information on the attitudes of the Emergency Response Team members towards the current training system, the amount of previous emergency response training members have had, and then to develop a formal training module, including a Leader's guide, for company X's Emergency Response Team. Because each shift relies on the Team Advisor for their training, a training module and Leader's Guide is needed to provide structure, making the training uniform for all members. Providing the Emergency Response Team with uniform training will make for more competent Emergency Response Team members, and ultimately providing a safer work environment.

*Assumptions of the Study*

Effective training of the Emergency Response Team increases its ability to think critically, asses the emergency, and provide a safe environment for the employees of company X.

There are several assumptions made in this study:

1) The information received from Company X accurately represents the current Emergency Response Team training module.
2) The training module developed in this study will be implemented by company X.
3) The Leader's guide developed in this study will provide uniform training for the Emergency Response Team at company X.
4) This research can be applied to the Emergency Response Team at the Gateway Plant, a second Infant Formula plant within Company X's network.
5) Because Company X owns multiple manufacturing facilities, throughout the United States, this research may be used at facilities outside of Eau Claire, WI.

*Definition of Terms*

*Confined Space* - an area which: has adequate size and configuration for employee entry, has limited means of entering and exiting, and is not designed for continuous employee occupancy ( Confined Space Entry, 1994)

*Emergency Response Team* – The team responsible for responding to emergencies. (Glossary of safety and health acronyms, 2004)

*Leader's Guide* – (Instructor's Guide) A guide which contains set-up instructions, annotated visuals to use in lectures, instructions for administering learning activities, and a close-out list for ending the course. (Carliner, 2003. American Society for Training and Development)

*Lockout* –The placement of a lockout device on any energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed. (Lockout/Tagout.,1996)

*Occupational Safety & Health Administration* – A law passed by U.S. Congress to prevent employees from being injured or contracting diseases in the course of their employment (Word Net, 1997., Princeton University)

*Tagout* – The placement of a tagout device on any energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not yet be operated until the tagout device is removed. (Lockout/tagout,1996)

*Limitations of the Study*

1) This research is limited to the infant formula industry.

2) This research is limited to current members of the Emergency Response Team at Company X.

3) The sample size of the survey is 40 employees.

4) Not all employees surveyed returned their questionnaire.

5) There may be a lack of commitment from management of company X.

*Methodology*

Information was gathered from Emergency Response Team members at Company X. The methodology used to gather data in this research was a self report survey created by the researcher. It measured previous exposure to emergency response training and the attitudes towards the current Emergency Response Team training at Company X. On April 12, 2004 the researcher delivered the surveys to Company X for dispersing. The surveys were given to all members of the Emergency Response Team at Company X, 40 employees. The members were asked to complete the survey within one week and return them to the front desk. The researcher returned to Company X on April 19, 2004 and retrieved the surveys. Out of the 40 surveys administered, 19 surveys were returned. On April 21, 2004 the researcher returned to Company X and collected an additional 6 surveys that were handed in late. Of the 40 members surveyed a total of 25 returned them. Descriptive and inferential statistics were then used to analyze this data.

# CHAPTER II

## LITERATURE REVIEW

Having an effectively trained Emergency Response Team is an excellent way for companies to deal with workplace accidents, injuries, and emergencies. Company X, an infant formula manufacturer in Eau Claire, WI chose to create its own in-house Emergency Response Team to handle workplace accidents, injuries, and emergencies. It is comprised of general maintenance, calibration technicians, Team Advisors, Engineering, and the Safety Manager.

Company X has identified potential plant emergencies involving Confined Space entry, Chemical spills, Alarms (including fire, weather, and ammonia) and employee injury. To prepare for these potential emergencies, Company X divided its training into five areas: Medical emergencies, Confined Space Entry emergencies, Systems & Alarms (including weather, fire, and ammonia alarms,) Chemical Hazard emergencies, and the application of Lockout/Tagout when responding to emergencies. The current program provides training at intervals of quarterly training. One quarter focuses on First Aid, the next on Confined Space Entry, the next on Chemical Hazards, and the last quarter on Systems & Alarms. (Safety Manager, Personal Interview, June. 2003).

Company X uses a training module for its Emergency Response Team that has no formal schedule, no Leader's Guide, and no system for administering training materials with uniformity. The purpose of this study is to develop a training module, including a Leader's Guide, for the Emergency Response Team at Company X. Because Company X has already developed the materials for training, this research will organize the existing materials so that it optimizes learning and complies with OSHA standards.

The literature review section of this project discusses topics that relate directly to the development of a Training Module and Leader's Guide. The categories that were chosen by the researcher were included as a means of focusing the project. The categories discussed are:

*The importance of a safety program*

Commitment from management

OSHA's history

OSHA's safety training requirements in the areas of:

First Aid/CPR

Confined Space Entry

Systems and Alarms (Weather, Fire, and Ammonia)

Chemical Hazards

Learning Theories

*The components of a Leader's Guide*

## The Importance of a Safety Program

The importance of an effective workplace safety and health program cannot be overemphasized. Employers recognize the importance of safety training and having a safety program for its employees to handle emergencies. There are several benefits from such a program including increased productivity, improved employee morale, reduced absentees due to illness, and reduced workers' compensation rates; however, incidents still occur in spite of efforts to prevent. Therefore, proper planning for emergencies is necessary to minimize employee injury and property damage. (Emergency Preparedness, 2003)

Having an effective process to manage safety and health is crucial if a company is to prevent or reduce injuries and illnesses, stay in compliance, and realize cost savings. In order for a process to run at maximum efficiency, a formal system needs to be in place. (Safety Management, 2003)

The benefits of effective emergency preparedness include: being able to recognize emergency situations, knowing how to respond to a variety of emergencies, knowing how to evacuate, and knowing how to reduce personal injuries and property damage. (Emergency Preparedness. 1994)

## Commitment from Management

The commitment of management and the involvement of employees are absolutely essential to the authority and effectiveness of the safety committee, but management commitment must come first. (J.J.Keller & Associates, Inc. 1997)

## OSHA's History

Every Safety Program is regulated by the standards set by the Occupational Safety & Health Administration (OSHA.) The Occupational Safety and Health Act of 1970 heralded a new era in the history of public efforts to protect workers from harm on the job. This Act established for the first time a nationwide, federal program to protect the work force from job-related death, injury and illness. A special agency was created to administer the Act. The agency was called the Occupational Safety & Health Administration. Its mission has been "*to assure so far as possible every working man and woman in the nation safe and healthful working conditions.*" (Rothwell, W., Benkowski, J. 2002, P.253) OSHA has played an enormous part in directing business and industries into operating in a safer manner and providing a better working environment for

employees. For over thirty years OSHA has helped employers and employees save lives, prevent injuries, and protect the health of America's workforce. (U.S. Department of Labor, 2003)

OSHA suggests "employers should establish effective safety and health programs and prepare their workers to handle emergencies before they arise."(U.S. Department of Labor, 2003)

## OSHA's Safety Training Requirements

When emergency action plans are required by a particular OSHA standard, it must be in writing, except for firms with 10 or few employees, and must include, as a minimum, the following: Emergency escape procedures and route assignments, Procedures to be followed for all employees who remain to perform (or shut down) critical plant operations while the plant is evacuated, Procedures to account for all employees after emergency evacuation has been completed, Rescue and medical duties for those employees who are to perform them, The preferred means for reporting fires and other emergencies, and Names or regular job titles of persons or departments to be contacted for further information or explanation of duties under the plan.(Responding to, 2003)

The Occupational Safety and Health Administration (OSHA) established Standard 29 CFR 1910.38 to cover employee emergency plans in the workplace.

The key requirements of the standard include: 1) A written emergency preparedness program that describes what actions employers and employees must take to ensure employee safety from fires and other emergencies, 2) An employee alarm system to alert employees in the event of an emergency, 3) Identification of

the types of evacuation to be used in emergency situations, and 4) Training of a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees. (Emergency Preparedness, 1994)

*First Aid/CPR*

OSHA standards for Medical services are found in 29CFR1910.151. Medical services and first aid, subpart (k) of 29 CFR 1910.151 states:

(a) The employer shall ensure the ready availability of medical personnel for advice and consultation of matters of plant health.

(b) In the absence of an infirmary, clinic, or hospital in near proximity to the workplace which is used for the treatment of all injured employees, a person or persons shall be adequately trained to render first aid. Adequate first aid supplies shall be readily available.

The employer must provide an emergency response time of: 15 minutes in non life threatening situations, and three to four minutes in life threatening situations. (Medical service, 2004)

To guarantee adequate training in CPR, Blood bourn Pathogens, and the use of a defibulator, Company X hires an area hospital to provide the training for the Emergency Response Team. CPR refresher/recertification is to be completed on an annual basis, for all cardholders. This is the only area of training where Company X relies on an outside source for instruction, for all other areas Company X uses its own safety committee members to provide training.

First Aid training is provided by Company X, using a certified safety committee member. According to the Red Cross, refresher courses in First Aid are only required to be completed every three years. (Red Cross- Chippewa Valley Chapter, 2004)

*Confined Space Entry*

Confined Space Entry Procedure and Permitting Systems are highly regulated by OSHA standard 29 CFR 1910.146. When the employer's permit entry program allows attendant entry for rescue, attendants may enter a permit space to attempt a rescue if they have been trained and equipped for rescue operations. Details of Training are listed in 29 CFR 1910.146 Subpart K.

(k)(2) An employer whose employees have been designated to provide permit space rescue and emergency services shall take the following measures:

(k)(2)(i) Provide affected employees with the personal protective equipment (PPE) needed to conduct permit space rescues safely and train affected employees so they are proficient in the use of that PPE, at no cost to those employees;

(k)(2)(ii) Train affected employees to perform assigned rescue duties. The employer must ensure that such employees successfully complete the training required to establish proficiency as an authorized entrant, as provided by paragraphs (g) and (h) of this section;

(k)(2)(iii) Train affected employees in basic first-aid and cardiopulmonary resuscitation (CPR). The employer shall ensure that at least one member of the rescue team or service holding a current certification in first aid and CPR is available; and

(k)(2)(iv) Ensure that affected employees practice making permit space rescues at least once every 12 months, by means of simulated rescue operations in which they remove dummies, manikins, or actual persons from the actual permit spaces or from representative permit spaces. Representative permit spaces shall, with respect to opening size, configuration, and accessibility, simulate the types of permit spaces from which rescue is to be performed. (U.S. Department of Labor, 2003)

*Systems and Alarms*

Systems and Alarms training for company X include Fire and Ammonia, which involves an evacuation of areas of the plant or the entire building, and Tornado and Severe Whether which involves directing employees to a designated area called Tornado Hallway. A green flashing light with a steady tone is used to signal Ammonia Alarm, a white flashing light with a steady tone is used to signal Fire Alarm, and a flashing white light with a broken tone is used to signal Severe Weather Alarm.

Employee training for Ammonia in safe operation procedures, first-aid measures in the use of suitable operating and protective equipment, properly maintained, should be included as an essential element in any comprehensive safety program. (LaRoche Industries Inc., 1989)

Systems and Alarms are regulated by OSHA through 29 CFR 1910.38. This is covered under Emergency Action Plans.

29 CFR 1910.38(d) The employee alarm system must use a distinctive signal for each purpose and comply with the requirements in 1910.165.

29 CFR 1910.38(e) *Training.* An employer must designate and train employees to assist in a safe and orderly evacuation of other employees.

*Chemical Hazards*

OSHA regulates Hazardous Material Handling and HAZWOPER training through 29 CFR 1910.120.(1) General (i) Employers shall develop and implement a written safety and health program for their employees involved in hazardous waste operations. It should include identify, evaluate, and control safety and health hazards, and provide for emergency response for hazardous waste operations.

29 CFR 1910.120(e)(7) *Emergency response.* Employees who are engaged in responding to hazardous emergency situations at hazardous waste clean-up sites that may expose them to hazardous substances shall be trained in how to respond to such expected emergencies. (U.S. Department of Labor, 2003)

29 CFR 1910.120(p)(8)(iii) *Training.* (A) Training for emergency response employees shall be completed before they are called upon to perform in real emergencies. Such training shall include the elements of the emergency response plan, standard operating procedures the employer has established for the job, the personal protective equipment to be worn and procedures for handling emergency incidents.

(p)(8)(iii)(C) The employer shall certify that each covered employee has attended and successfully completed the training required in paragaph (p)(8)(iii) of this section, or shall certify the employee's competency at least yearly. The method used to demonstrate competency for certification of training shall be recorded and maintained by the employer.

29 CFR 1910.120(q)(6) *Training.* Training shall be based on the duties and function to be performed by each responder of an emergency response organization.

The Emergency Response Team members at Company X function on a First Responder operations level.

29 CFR 1910.120(q)(6)(ii) *First responder operations level.* First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from safe distance, keep it from spreading, and prevent exposures. First responders at the operational level shall have received at least eight hours of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed for the awareness level and the employer shall so certify:

(q)(6)(ii)(A) Knowledge of the basic hazard and risk assessment techniques.

(q)(6)(ii)(B) Know how to select and use proper personal protective equipment provided to the first responder operational level.

(q)(6)(ii)(C) An understanding of basic hazardous materials terms.

(q)(6)(ii)(D) Know how to perform basic control, containment and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit.

(q)(6)(ii)(E) Know how to implement basic decontamination procedures.

(q)(6)(ii)(F) An understanding of the relevant standard operating procedures and termination procedures.

Although refresher training is only required annually, it is important to practice for such emergencies. 29 CFR 1910.120 (p)(8)(iv)(C) The emergency response plan shall be rehearsed regularly as part of the overall training program for site operations. (U.S. Department of Labor, 2003)

OSHA established standard 29CFR 1910.147 for the Control of Hazardous Energy and these are the guidelines that companies must comply with in training their employees about Lockout/Tagout procedures. Lockout/Tagout is an important part of training to general machine operators, maintenance personal, and all members of the Emergency Response Team. It can help protect employees servicing the equipment, protect the equipment itself and protect any operators and bystanders. (Lockout/Tagout, 1994) Although Locking out a machine is usually done to prevent injury, such as in general maintenance or repairs, it may be necessary to Lockout a machine due to employee injury or to assist an injured employee. In order to be effective in an emergency, and respond to an inured employee, the Emergency Response Team member must be able to make the area safe for the injured employee, employees in the area, and him or herself. Locking out a machine can prevent further injury by isolating and controlling an energized machine or piece of equipment. (Charles Management, Inc. 1996)

## Learning Theories

Once the materials are developed, and the curriculum formatted into units, we must focus our attention on the learner. It is not enough to stand in front of people and lecture. The material must be presented in a manner that best suits the audience. Because every person learns differently, the curriculum must accommodate the variety of learning

styles. Three distinct communication and learning styles have been identified: Visual (learning through seeing,) Auditory (learning through hearing,) and Kinesthetic (learning through doing – hands on.) (Rose, C., Nicholl, M. 1997)

Auditory strategies include putting auditory emphasis, speaking louder or softer than usual, on important information in a lecture and summarizing information out loud. Ask the students to repeat back information. Visual strategies include using acronyms, drawing pictures, displaying overheads, showing diagrams, using a variety of colors in hand-outs, and watching videos. Lastly, there are Kinesthetic strategies which include learning in small groups, role playing, and note taking because it puts lectured (auditory) material into a physical form on paper. (Rose, C., Nicholl, M. 1997)

It has been suggested that the more strategies used in teaching, the more learning that takes place. We remember approximately 20% of what we read, 30% of what we hear, 40% of what we see, 50% of what we say, 60% of what we do, and 90% of what we see, hear, say, and do. (Rose, C., Nicholl, M. 1997)

This would suggest that the learning module should include lecture, overheads, group discussions, table-top exercises, and mock runs to fully utilize learning strategies and increase the amount of material Emergency Response Team members can learn.

Mental review and hands-on review are part of the learning process. Repetition and review are essential to long-term memory. Material should be reviewed frequently. Materials should be briefly reviewed after one hour, one day, one week, one month, and six months. (Rose, C., Nicholl, M. 1997) It's also important to allow for immediate application of new information. This immediate application translates learning into "real uses" for the new information. It also provides opportunity for immediate feedback.

(Enhancing your teaching effectiveness, 2003) Research shows that learned information used within the following 24 hours is more likely to be retained long-term. (Rose, C., Nicholl, M., 1997)

The effectiveness of response during emergencies depends on the amount of planning and training performed by Emergency Response Team members and management. Effective training involves timely and appropriate training activities and reviewing plans of action for workplace emergencies.

Emergency preparation is an ongoing activity. Preparation should involve planning, training, exercises, and corrective action. Drills and exercises measures the effectiveness of your emergency response plan, measure the effectiveness of your training program, and enable you to see where plans and training need to be changed. (J.J. Keller & Associates, Inc., 1996)

## Components of a Leader's Guide

A Leader's Guide can provide the instructor (A Team Advisor in this case) a uniform format that includes a variety of cues that will increase the effectiveness of safety training.

A Leader's Guide, also called an instructor's guide, provides annotated versions of the exercises and gives hints to the instructor. It includes set-up instructions, annotated visuals to use in the lectures, instructions for administering activities, and a close-out list for the end of the unit. (Carliner, S., 2003) A Leader's Guide is much like a teacher's edition of a textbook, providing you with structure, background information, and coordinating materials for the instructor. (J.J. Keller & Associates, Inc., 1997)

In order to make instruction uniform and flow more smoothly some Leader's Guides use a cue, at the left of the page, such as a word or two to give hints about the information being presented while others use visual cues such as pictures. For instance a checkmark may indicate previously covered material, a question-mark might signal it's time for a question and answer session, an overhead would signal to use the specific numbered overhead, and a circle may indicate a group activity.

# CHAPTER III

# METHODOLOGY

Company X currently uses an informal training system, which lacks structure, for its Emergency Response Team training. The current training system is conducted with no formal schedule and no Leader's Guide. Because employee safety is of utmost importance, a consistent and formal training module, including a Leader's guide, needed to be developed to increase the uniformity of Emergency Response Team training at Company X.

The purpose of this study is to research and develop a training module, including a Leader's guide, for the Emergency Response Team at Company X.

This chapter will include attitudes of current Emergency Response Team members at Company X, OSHA requirements in Emergency Response Team Training, and some Adult Learning Theories that improve training and the learning process.

This chapter will address subject selection and description, instrumentation, data collection procedures, data analysis, and limitations.

## *Subject Selection and Description*

The population surveyed in this study was the Emergency Response Team at Company X. Members of the Emergency Response Team included maintenance personnel, calibration technicians, Team Advisors, Engineers, and the Safety Manager. The sample size of those surveyed was 40 people.

*Instrumentation*

A self-report survey of nine questions, created by the researcher, was used to gather information from current Emergency Response Team members. The survey instrument was designed to answer the following objectives:

1. Determine the number of Emergency Response Team members that have had previous training in Emergency Response, in the areas of First Aid/CPR, Confined Space Entry, Chemical Hazards, and Systems and Alarms.
2. Determine the attitudes and opinions of the Emergency Response Team members towards the current Emergency Response Team training system.

The instrument used by the researcher was a confidential self report survey. Each of the departments received colored questionnaires, color-coordinated to represent each of the different departments. General Maintenance received white colored questionnaires, Engineering/Safety Manager received blue colored questionnaires, Calibration Technicians received yellow colored questionnaires, and Team Advisors received green colored questionnaires.

The first four questions of the survey dealt with nominal data pertaining to previous exposure to emergency response training, in the areas of First Aid/CPR, Confined Space Entry, Chemical Hazards, and Systems and Alarms, with the option of answering "Yes" or "No." The content of the remaining five questions in the survey, dealt with interval data pertaining to the individual attitudes and perceptions of the current training curriculum and satisfaction of the training format. For the last five questions in the survey a Likert scale of 1 through 5 was used. 1 equaled strongly disagree, 2 equaled disagree, 3 equaled neutral, 4 equaled agree, and 5 equaled strongly agreed. (See appendixes C)

*Data Collection Procedures*

On April 12 questionnaires were delivered to the front desk at Company X for dispersement. With the assistance of the training department at Company X the color coordinated questionnaires were then delivered to the appropriate Emergency Response Team(ERT) members in the designated departments. Each ERT member then returned the completed survey to the front desk where they were placed in a folder, and picked up by the researcher on April19. The researcher again returned to Company X on April 21 to collect surveys that were turned in past the deadline.

*Data Analysis*

There were several statistical analyses used in this study. Data gathered from the survey was analyzed to determine mean, standard deviation, frequency count, and percent. The data analysis information was then compiled and summarized to determine Emergency Response Team members' attitudes towards the current training system and the number of members that have previously had emergency response training. A summary of the findings are discussed further in the following chapter.

*Limitations*

1. This study is limited in that the surveys were completed by Emergency Response Team members at both the Eau Claire Plant and the Gateway Plant.
2. This research survey relies partly on the opinions of the Emergency Response Team members.
3. Not all members of the Emergency Response Team returned the survey.
4. There were no open-ended questions that would allow members the opportunity to give examples of specific areas of concern.

*Summary*

The objective of this survey was to determine the attitudes of the Emergency Response Team members towards the current training system at Company X and also determine the number of members who have had previous emergency response training. The design of the survey, the delivery, and the demographics of the surveyed population were presented in Chapter 3.

# CHAPTER IV

# RESULTS

## *Introduction*

Chapter 4 reports the data findings of this study. The researcher developed a self-report survey designed to determine Emergency Response Team members' attitudes about current emergency response training at Company X, and also previous exposure to training in the areas of first-aid/CPR, confined space entry, hazardous materials, and systems and alarms. The results reported show both the responses of the entire population and the population broken down by department. The researcher attempted to see if any one department's responses varied from the others. The survey was delivered to all 40 members of the Emergency Response Team. Usable responses were obtained from 25 members for a rate of response of .625. The data gathered from this survey was complied and the findings of the analysis are discussed in this chapter.

## *Emergency Response Team Survey*

The object of the Emergency Response Team survey was to determine the attitudes of Emergency Response Team members towards the current emergency response training system at Company X and any previous exposure to emergency response training. The survey that was created used both a method for collecting nominal data, "yes/no", for the first four questions, and a Likert scale, for the last five questions. The Likert range of response was from:

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree.

*Group Demographics*

The group surveyed consisted of 40 Emergency Response Team members at Company X who work in several different departments. The department breakdown is as follows:

| | |
|---|---|
| Team Advisors | 6 |
| Calibration Technicians | 4 |
| Engineers/Safety Manager | 4 |
| General Maintenance | 26 |

Of the 40 surveys distributed, 25 surveys were returned. All 25 surveys were usable. The breakdown of the returned surveys is as follows:

| | |
|---|---|
| Team Advisors | 4 |
| Calibration Technicians | 2 |
| Engineers/ Safety Manager | 2 |
| General Maintenance | 17 |

*Item Analysis*

The following tables show questions asked of the Emergency Response Team members. Some of the questions were designed to elicit responses that are focused on attitudes towards the current emergency response training system while others focused on previous exposure to emergency response training. Responses varied from question to question but, statistically, a common thread runs through the members about attitudes on the current emergency response training system.

The first four questions in the survey were used to determine previous exposure to Emergency Response Team training.

**Question 1.**

Have you had training in First Aid/CPR previous to being on the Emergency Response Team?

This survey question was developed to determine the number of Emergency Response Team members that have had previous First Aid/CPR training (see Table 1). A total of 17 members (65%) have had previous First Aid/CPR training. The results of those participants that had previous First Aid/CPR training were broken down further by department. 3 (12%) Team Advisors, 1 (4%) Calibration Technicians, 1 (4%) Engineers/ Safety Managers, and 10 (48%) General Maintenance reported having previous exposure to First Aid/CPR training.

**Table1.**

**Surveyed members' responses to the question: Have you had training in First Aid/CPR previous to being on the Emergency Response Team?**

| | YES | NO |
|---|---|---|
| Team Advisors | 3 | 1 |
| Calibration Technicians | 1 | 1 |
| Engineers/Safety Manager | 1 | 1 |
| General Maintenance | 12 | 5 |
| Total | 17 | 8 |

**Question 2.**

Have you had training in Confined Space Entry previous to being on the Emergency Response Team?

This survey question was designed to determine the number of Emergency Response Team members that have had previous Confined Space Entry training (see Table 2). A total of 12 members (48%) have had previous training in Confined Space Entry. Broken down by department, of those reported having previous training in Confined Space Entry 2 (8%) were Team Advisors, 0 (0%) were Calibration Technicians, 0 (0%) were Engineers/ Safety Manager, and 10 (40%) were General Maintenance.

**Table 2.**

**Surveyed members' responses to the question: Have you had training in Confined Space Entry previous to being on the Emergency Response Team?**

| | YES | NO |
|---|---|---|
| Team Advisors | 2 | 2 |
| Calibration Technicians | 0 | 2 |
| Engineering/ Safety Manager | 0 | 2 |
| General Maintenance | 10 | 7 |
| Total | 12 | 13 |

**Question 3.**

Have you had training in Chemical Hazards previous to being on the Emergency Response Team?

This survey question was designed to determine the number of Emergency Response Team members that have had previous Chemical Hazards training (see Table 3). A total of 14 members (56%) have had previous Chemical Hazards training. Broken down by department, of the total population that reported previous Chemical Hazards

training, 3 (12%) were Team Advisors, 0 (0%) were Calibration Technicians, 1 (4%) were Engineers/Safety Manager and 10 (40%) were General Maintenance.

**Table 3.**

**Surveyed members' responses to the question: Have you had training in *Chemical Hazards previous to being on the Emergency Response Team?***

| | YES | NO |
|---|---|---|
| Team Advisors | 3 | 1 |
| Calibration Technicians | 0 | 2 |
| Engineering/ Safety Manager | 1 | 1 |
| General Maintenance | 10 | 7 |
| Total | 14 | 11 |

**Question 4.**

Have you had training in Systems and Alarms previous to being on the Emergency Response Team?

This survey question was designed to determine the number of Emergency Response Team members that have had previous training in Systems and Alarms (see Table 4). A total of 15 members (60%) have had previous training in Systems and Alarms. Broken down by department, of the total population that reported having previous training in Systems and Alarms, 8% were Team Advisors, 8% were Calibration Technicians, 8% were Engineers/ Safety Manager, and 36% were General Maintenance.

**Table 4.**

**Surveyed members' responses to the question: Have you had training in Systems and Alarms previous to being on the Emergency Response Team?**

| | YES | NO |
|---|---|---|
| Team Advisors | 2 | 2 |
| Calibration Technicians | 2 | 0 |
| Engineering/ Safety Manager | 2 | 0 |
| General Maintenance | 9 | 8 |
| Total | 15 | 10 |

The remaining five questions were used to determine Emergency Response Team members' attitudes towards the current training system, in the areas of First Aid/CPR, Confined Space Entry, Chemical Hazards, and Systems and Alarms.

***Question 5.***

I feel the current training curriculum provides adequate hands-on training in First Aid/CPR?

This survey statement asked participants to rate the agreement or disagreement concerning the current training system providing adequate hand-on training in First Aid/CPR (see Table 5). The results show three participants (12%) strongly disagreed, five participants (20%) disagreed, five participants (20%) were neutral, eleven participants (44%) agreed, and only one participant (4%) strongly agreed. The mean response for this statement was 3.08. The standard deviation was 1.1518.

**Table 5.**

**Surveyed members' responses to the statement: I feel the current training curriculum provides adequate hands-on training in First Aid/CPR.**

| Value | Frequency (25) | Percent (100) |
|---|---|---|
| 1=Strongly Disagree | 3 | 12 |
| 2=Disagree | 5 | 20 |
| 3=Neutral | 5 | 20 |
| 4=Agree | 11 | 44 |
| 5=Strongly Agree | 1 | 4 |

Mean= 3.08
Standard Deviation= 1.1518

**Question 6.**

I feel the current training curriculum provides adequate hands-on training in Confined Space Entry.

This survey statement asked participants to rate the agreement or disagreement concerning the current training system providing adequate hands-on training in Confined Space Entry (see Table 6). The results show one participant (4%) strongly disagree, two participants (8%) disagree, three participants (12%) were neutral, seventeen participants (68%) agree, and only two participants (8%) strongly agree. The mean response for this statement was 3.68. The standard deviation was 0.9.

**Table 6.**

**Surveyed members' responses to the statement: I feel the current training curriculum provides adequate hands-on training in Confined Space Entry.**

| Value | Frequency (40) | Percent (100) |
|---|---|---|
| 1=Strongly Disagree | 1 | 4 |
| 2=Disagree | 2 | 8 |
| 3=Neutral | 3 | 12 |
| 4=Agree | 17 | 68 |
| 5=Strongly Agree | 2 | 8 |

Mean= 3.68
Standard Deviation= 0.9

**Question 7.**

I feel the current training curriculum provides adequate hands-on training in Chemical Hazards.

This survey statement asked participants to rate the agreement or disagreement concerning the current training system providing adequate hands-on training in Chemical Hazards (see Table 7). The results show one participant (4%) strongly disagrees, five participants (20%) disagree, seven participants (28%) were neutral, twelve participants (48%) agreed, while 0 participants strongly agreed. The mean response for this statement was 3.2. The standard deviation was 0.91287.

**Table 7.**

**Surveyed members' responses to the statement: I feel the current training curriculum provides adequate hands-on training in Chemical Hazards.**

| Value | Frequency (40) | Percent (100) |
|---|---|---|
| 1=Strongly Disagree | 1 | 4 |
| 2=Disagree | 5 | 20 |
| 3=Neutral | 7 | 28 |
| 4=Agree | 12 | 48 |
| 5=Strongly Agree | 0 | 0 |

Mean= 3.2
Standard Deviation= 0.91287

**Question 8.**

I feel the current training curriculum provides adequate hands-on training in Systems/Alarms and evacuations.

This survey statement asked participants to rate the agreement or disagreement concerning the current training system providing adequate hands-on training in Systems and Alarms (see Table 8). The results show two participants (8%) strongly disagreed, seven participants disagreed, eight participants (32%) were neutral, eight participants (32%) agreed, and none of the participants strongly agreed. The mean response to this statement was 2.88. The standard deviation was 0.97125.

**Table 8.**

**Surveyed members' responses to the statement: I feel the current training curriculum provides adequate hands-on training in Systems/Alarms and evacuations.**

| Value | Frequency (40) | Percent (100) |
|---|---|---|
| 1=Strongly Disagree | 2 | 8 |
| 2=Disagree | 7 | 28 |
| 3=Neutral | 8 | 32 |
| 4=Agree | 8 | 32 |
| 5=Strongly Agree | 0 | 0 |

Mean= 2.88
Standard Deviation= 0.97125

**Question 9.**

I feel the current training curriculum provides enough mock runs throughout the year to feel confident about my Emergency Response skills and to be the first to arrive on the scene of an emergency.

This survey statement asked participants to rate the agreement or disagreement concerning the current training system providing enough mock runs throughout the year to feel confident about their learned skills to be first to arrive on the scene of an emergency (see Table 9). The results show four participants (16%) strongly disagree, ten participants (40%) disagree, seven participants (28%) were neutral, three participants (12%) agreed, and only one participant (4%) strongly agreed. The mean response for this statement was 2.48. The standard deviation was 1.04562.

**Table 9.**

**Surveyed members' responses to the statement: I feel the current training curriculum provides enough nock runs throughout the year to feel confident about my Emergency Response skills and to be the first to arrive on the scene of an emergency.**

| Value | Frequency (40) | Percent (100) |
|---|---|---|
| 1=Strongly Disagree | 4 | 16 |
| 2=Disagree | 10 | 40 |
| 3=Neutral | 7 | 28 |
| 4=Agree | 3 | 12 |
| 5=Strongly Agree | 1 | 4 |

Mean= 2.48
Standard Deviation= 1.04562

*Unanticipated Findings*

The research shows 56% of participants either strongly disagree or disagree that the current training system provides enough mock runs throughout the year for members to feel confident, about their emergency response skills, to arrive first on the scene of an emergency.

*Summary*

A self report survey was administered to the current members of the Emergency Response Team at Company X. The results of this study were reported in chapter four and researcher's recommendations will be discussed in chapter five.

# CHAPTER V

# DISCUSSION

Chapter five summarizes the field problem and discusses conclusions and recommendations made by the researcher.

## *Summary*

Company X currently uses an informal training system, which lacks structure, for its Emergency Response Team training. The current training system is conducted with no formal schedule and no Leader's Guide. Because employee safety is of utmost importance, a consistent and formal training module, including a Leader's guide, needed to be developed to increase the uniformity of Emergency Response Team training at Company X.

The purpose of this research was to develop a training module, including a Leader's guide, for the Emergency Response Team for Company X. The module was developed, in part, using information gathered from the self report survey that was administered to current members of the Emergency Response Team at Company X, and with information discussed in chapter two relating to OSHA requirements in training, learning theories, and components of Leader's guides.

## *Limitations*

This study was limited to:

1. The Infant Formula Industry.
2. The current members of the Emergency Response Team.
3. The design of the self report survey.

*Conclusions*

To fulfill the objectives of this study the researcher collected data from several areas. The learning theories discussed in chapter two states that learned material used within 24 hours increases its potential to be stored in long-term memory. It also states that material should be briefly reviewed after one hour, one day, one week, one month, and six months. Chapter two also discuses the development of a Leader's guide and how it's used to deliver more uniform training. The results from the self report survey administered to the Emergency Response Team members shows 56% strongly disagree or disagree that the current training system provides them enough mock runs throughout the year to feel comfortable in their skills to arrive first on the scene of an accident.

*Recommendations*

The researcher first recommends more frequent training, including material review and mock runs, for the Emergency Response Team members. A second recommendation includes an evaluation of the developed training module every two years to allow for changes in Company policy, OSHA requirements, and industry standards. A third recommendation is the use of the Training Module and Leader's guide, developed by the researcher. The researcher developed the training Module and Leader's guide for the Emergency Response Team at Company X, in the areas of Systems & Alarms (Appendix D), and Medical First Aid. (Appendix E)

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# APPENDIX A

## Consent form

# Consent Form

I understand that by returning the/this questionnaire, I am giving my informed consent as a participating volunteer in this study. I understand the basic nature of the study and agree that any potential risks are exceedingly small. I also understand that the information being collected will be used to improve the current Emergency Response Team training system. I am aware that the information is being sought in a specific manner so that no identifiers are needed, beyond shift identity, and that confidentiality is guaranteed. I am aware that this information will be provided to my employer. I realize that I have the right to refuse to participate and that my right to withdraw from participation at any time during the study will be respected.

NOTE: Questions or concerns about participation in this survey should first be directed to the researcher, Kate Nolin at (715) 235-9532, the research advisor Dr. Joseph Benkowski at (715) 232-5266, and second Sue Foxwell, UW-Stout Administrator for the Protection of Human Subjects, UW-Stout, Menomonie, WI 54751, phone (715) 232-2477.

# APPENDIX B

## Survey Cover Letter

Survey Cover Letter


The company is in the process of updating training for the Emergency Response Team. All members of the E.R.T. are being asked to fill out this survey and return it to the blank envelope provided to each Maintenance Team Advisor, or to the Safety Manager, by April 19.

The information from this survey will be used to make changes in the current training curriculum. Please be honest and feel free to make any suggestions not covered in the questionnaire. Comments may be written on the back of this survey.

*This survey is confidential and individuals cannot be identified.* Each department, however, will receive a specific color-coded survey to identify department response rates.

# APPENDIX C

## Survey Instrument

# Emergency Response Team Questionnaire

| | | |
|---|---|---|
| 1. | Have you had training in First Aid/CPR previously to being on the Emergency Response Team? | YES__ NO__ |
| 2. | Have you had training in Confined Space Entry previously to being on the Emergency Response Team? | YES__ NO__ |
| 3. | Have you had training in Chemical Hazards previously to being on the Emergency Response Team? | YES__ NO__ |
| 4. | Have you had training in Systems/Alarms and evacuations previously to being on the Emergency Response Team? | YES__ NO__ |

## Please rate the following statements using the scale below.

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

| | | |
|---|---|---|
| 5. | I feel the current training curriculum provides adequate hands-on training in First Aid/CPR. | 1 2 3 4 5 |
| 6. | I feel the current training curriculum provides adequate hands-on training in Confined Space entry. | 1 2 3 4 5 |
| 7. | I feel the current training curriculum provides adequate hands-on training in Chemical Hazards. | 1 2 3 4 5 |
| 8. | I fee the current training curriculum provides adequate hands-on training in Systems/Alarms and evacuations. | 1 2 3 4 5 |
| 9. | I feel the current training curriculum provides enough mock runs throughout the year to feel confident about my Emergency Response skills and to be the first to arrive on the scene of an emergency. | 1 2 3 4 5 |

# APPENDIX D

## Training Module and Leader's Guide for Systems & Alarm

Systems & Alarms Training

## Course Description

The course focuses on knowledge, skills and aptitudes needed to effectively respond to a plant wide alarm, successfully detect Anhydrous Ammonia leaks, evacuate personal for Anhydrous Ammonia leaks, garb in proper Personal Protective Equipment if staying behind to manage an Anhydrous Ammonia leak, evacuate for a fire, and relocate personnel for severe weather.

## Goals for the Course

The goal for this course is to have participants practice the skills useful in detecting the release of Anhydrous Ammonia and evacuation & relocation procedures for fire and severe weather.

## Objective of the Course

Upon completion of the course, participants will be able to:

1. Identify detection methods for Anhydrous Ammonia
2. Identify location(s) of Anhydrous Ammonia in the plant
3. Identify evacuation method for Anhydrous Ammonia
4. Identify where in the plant you can find:

    Suction Valves
    Make-up Valves
    King Valve – Manual and Electric
    Liquid Pumps
    Manual Vent Valve – High and Low

5. Identify Personal Protective Equipment used when attempting to control an Anhydrous Ammonia leak
6. Identify the type of alarms used for Anhydrous Ammonia, Fire, and Severe Weather

## Course Materials

1. Hand-outs RULE OF FIVE: Ammonia NH3 Safety Training
2. Over Head WHAT TO USE WHEN

| | | |
|---|---|---|
| 3. | Over Head | Ammonia Basic |
| 4. | Over Head | P.P.E. For Ammonia |
| 5. | Over Head | HIGH SIDE: Our System |
| 6. | Over Head | LOW SIDE: Our System |
| 7. | Over Head | *Relief Systems and Other Details* |
| 7. | Booklet | Anhydrous Ammonia Safety (La Roche Industries Inc.) |
| 8. | Video | Systems & Alarms |
| 9. | Quiz | Emergency Response Team Quiz #1 |

**Units of Instruction**

I. Anhydrous Ammonia Training

II. Types of Alarms

III. Employee Evacuation and Relocation Procedures

# Leader's Guide
Systems & Alarms

# Unit 1 – Anhydrous Ammonia Training

| Time (minutes) | | |
|---|---|---|
| | ***Introduction*** | |
| 2 | Introduce the unit topic | |
| 2 | ***H*** | Pass out Hand-out "RULE OF FIVE: Ammonia NH3 Safety Training" and "Anhydrous Ammonia Safety" |
| | ***Discussion*** | |
| | | (Hand-out "RULE OF FIVE") |
| 15 | Discuss | Physical & Chemical properties of Anhydrous Ammonia<br>Fire and Explosion<br>Reactivity<br>Health Hazards<br>Precautions and Control Measures<br>Personal Protective Equipment<br>Control Measures |
| | | (Hand-out "Anhydrous Ammonia Safety") |
| 15 | Discuss | Primary Hazards<br>Exposure Limits<br>Personal Protective Equipment<br>Emergency Protective and Safety Equipment<br>First Aid Procedures<br>Leak Detection/ Control |
| 5 | ***O*** | Display and discuss Over Heads for this unit:<br><br>What To Use When<br>Ammonia Basics<br>P.P.E. For Ammonia<br>HIGH SIDE: Our System<br>LOW SIDE: Our System<br>Relief Systems and Other Details |

***Review***

Briefly review the material through question and answer:

5 ? ASK: What are the Physical & Chemical properties of Anhydrous Ammonia?

5 ? ASK: Are there any unusual Fire and Explosion hazards?

5 ? ASK: What is the reactivity of Anhydrous Ammonia?

5 ? ASK: What are the Health Hazards of Anhydrous Ammonia?

5 ? ASK: What are the Precautions and Control Measures to take with Anhydrous Ammonia?

5 ? ASK: What is the Personal Protective Equipment available for the management of an Anhydrous Ammonia leak?

***Conclusion***

5 ? ASK: Are there any questions about the material covered in this unit?

# Unit 2 – Types of Alarms

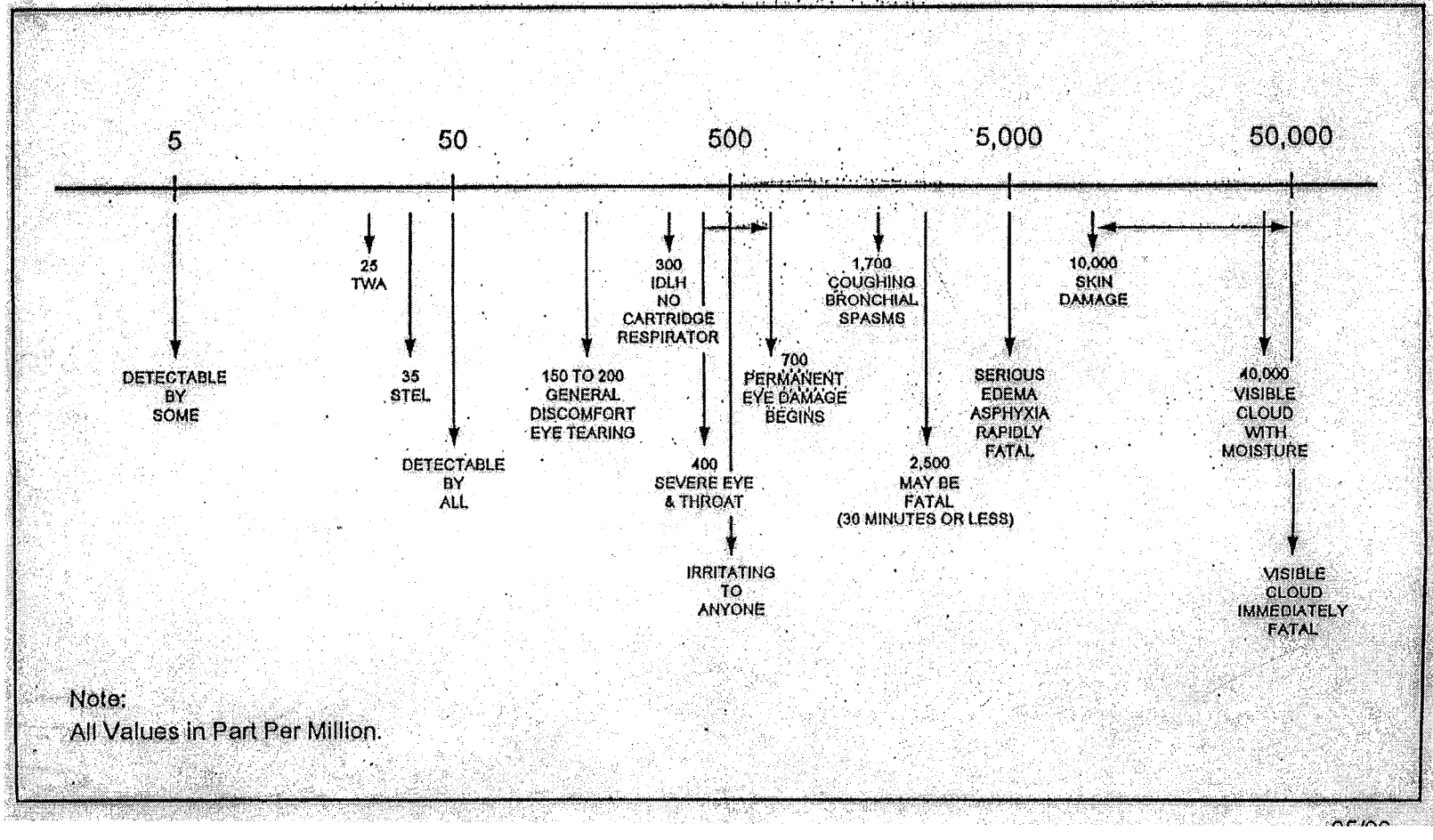
| Time (minutes) | | |
|---|---|---|
| | ***Introduction*** | |
| 2 | | Introduce the unit topic |
| | ***Discussion*** | |
| 10 | ? | ASK: What types of alarms do we have at this plant? |
| | | List the types of alarms, there locations, and identify their tone |
| 5 | *V* | Show the systems & alarms video |
| | ***Conclusion*** | |
| 5 | ? | ASK: Are there any questions about the material covered in this unit? |

# Unit 3 – Employee Evacuation and Relocation

| Time (minutes) | | |
|---|---|---|
| | ***Introduction*** | |
| 2 | Introduce the unit topic | |
| 2 | Refer to the Policy (SAF 0009-02) Health, Safety & Security Emergency Response Team Plan | |
| 10 | ? ASK: | What are some reasons the plant would need to evacuate or relocate employees? |
| | ***Discussion*** | |
| 10 | Discuss the roles and responsibilities of the Emergency Response Team members in the event of an evacuation or relocation of employees | |
| 2 | ? ASK: | In the event of an emergency, what station should your radios be turned to? |
| 2 | ? ASK: | What are the primary duties of the Facility Manager? |
| 2 | ? ASK: | What are the primary duties of the Engineering Manager? |
| 2 | ? ASK: | What are the primary duties of the Safety Manager? |
| 2 | ? ASK: | What are the primary duties of the Maintenance Superintendent? |
| | Answers: | Refer to the Company policy |
| 5 | Discuss Basic Emergency Evacuation Guidelines | |
| | ***Review*** | |
| 5 | Briefly review course material | |
| | ***Conclusion*** | |
| 5 | ? ASK: | Are there any questions about the material covered in this unit? |
| 35 | Give Quiz: | Emergency Response Team Quiz # 1 |

AMMONIA SAFETY & TRAINING INSTITUTE

# RULE OF FIVES




Note:
All Values in Part Per Million.

Product/Trade Name: ANHYDROUS AMMONIA

## SECTION II - HAZARDOUS INGREDIENTS

| Chemical Name | CAS Number | % | Exposure Limits (TWAs) in Air ACGIH TLV | OSHA PEL | STEL* |
|---|---|---|---|---|---|
| Ammonia | 7664-41-7 | 100 | 25 ppm/ 18 mg/m$^3$ | 25 ppm/ 18 mg/m$^3$ | 35 ppm |

*ACGIH short term exposure limit (STEL)

## SECTION III - PHYSICAL AND CHEMICAL PROPERTIES

**Physical State:** COMPRESSED GAS

**Appearance/Color/Odor:** COLORLESS GAS OR LIQUID WITH EXTREMELY PUNGENT ODOR

**pH:** 13+ **Melting Point:** -77.7° C; -107.9° F

**Boiling Point:** -33.4° C; -28.1° F **Solubility in Water** 100%

**Vapor Pressure(mmHg):** 2327 @ 0° C; 32° F **Molecular Weight:** 17.03

**Specific Gravity(Water = 1):** 0.68 @ -33.4°C; -28°F

**Density(Air = 1):** 0.6 (GAS), >1 (AEROSOL **% Volatile(by volume):** 100%

## SECTION IV - FIRE AND EXPLOSION

**Flash Point:** N/A **Autoignition Temperature:** 651°C; 1204°F

**Lower Flammable Limit:**16% by Volume **Upper Flammable Limit:** 25% by Volume

**Unusual Fire and Explosion Hazards:** If involved in fire, 16% to 25% Ammonia mixture with air may explode. Keep container cool to prevent bursting or release of gas. The presence of oil or other combustible materials will increase the fire hazard.

**Extinguishing Media:** Water Spray or Water Fog, Carbon Dioxide, Polar or Alcohol Foam, Dry Chemical.

**Special Firefighting Procedures:** Stop flow of gas. Use water fog to keep fire-exposed containers cool and to protect the men effecting the shut-off. Wear self-contained breathing apparatus (SCBA) and encapsulating chemical protective clothing. Approach fire upwind and evacuate area downwind.

Product/Trade Name: ANHYDROUS AMMONIA

## SECTION V - REACTIVITY

**Stability:** Stable

**Hazardous Polymerization:** Will not occur

**Conditions to Avoid:** Heat, open flames.

**Materials to Avoid:** Contact with oxidizing gases, chlorine, bromine, mineral hypochlorite iodine, halogens, calcium, and strong acids. Contact with copper, silver, zinc, and alloys of same. Mercury or silver oxide can form explosive compounds.

**Hazardous Decomposition Products:** Combustion will generate oxides of nitrogen.

## SECTION VI - HEALTH HAZARDS

**INGESTION:** This material is a gas under normal atmospheric conditions and ingestion is unlikely. Ingestion of liquid ammonia may result in severe irritation or ulceration of the mouth, throat and digestive tract which may be displayed by nausea, vomiting, diarrhea and, in severe cases, collapse, shock and death.

**INHALATION:** Irritation to the mucous membranes of the nose, throat and lungs is noticeable at 100 ppm. Concentrations above 400 ppm will cause throat irritation and may destroy mucous surfaces upon prolonged contact. High concentrations can cause pulmonary edema. Breathing air containing concentrations greater than 5,000 ppm may cause sudden death from spasm or inflammation of the larynx.

**SKIN:** Liquid Ammonia produces severe skin burns on contact. Ammonia gas may cause skin irritation, especially if skin is moist. The liquid can cause skin damage resulting from combined freezing and corrosive action on the skin. Atmospheric concentrations above 30,000 ppm will burn and blister skin after a few seconds of exposure.

**EYES:** Exposure to high gas concentrations may cause temporary blindness and severe eye damage. Direct contact of the eyes with liquid ammonia will produce serious eye burns.

**Carcinogenicity Lists:** NO

**NTP:** NO

**IARC Monograph:** NO

**OSHA Regulated:** YES

**Signs and Symptoms of Exposure:** Burning of the eyes, conjunctivitis, skin irritation, swelling of the eyelids and lips, dry red mouth and tongue, burning in the throat and coughing. In more severe cases of exposure, difficulty in breathing, signs and symptoms of lung congestion, and, ultimately, death from respiratory failure due to pulmonary edema may occur.

**Effects of Overexposure:** Irritation and burns of the skin and mucous membranes. Headache, salivation, nausea, and vomiting. Difficult or labored breathing and cough with bloody mucous discharge. Bronchitis, laryngitis, hemoptysis, and pulmonary edema or pneumonitis. Death may result. Ulceration of the conjunctiva and cornea, and corneal and lenticular opacities. Damage to the eyes may be permanent.

## SECTION VI - HEALTH HAZARDS - CONTINUED

**Emergency and First Aid Procedures:**

**INGESTION:** If this gas is swallowed in liquid form, keep victim warm and OBTAIN MEDICAL ATTENTION. If signs of respiratory obstruction develop, immediately transport to medical facility. Do not induce vomiting. Never give fluids or induce vomiting if patient is unconscious or having convulsions.

**INHALATION:** Remove victim to fresh air. Give oxygen if breathing is difficult. If breathing has stopped, start artificial respiration. OBTAIN MEDICAL ATTENTION.

**SKIN:** Apply water immediately to exposed areas of skin and continue for at least 30 minutes. Remove contaminated clothing while continuing to apply water, being careful not to tear the skin. Do not apply salves or ointments to affected areas. OBTAIN MEDICAL ATTENTION.

**EYES:** Remove victim to fresh air. Immediately flush with flowing water for at least 30 minutes with the eyelids held apart. OBTAIN MEDICAL ATTENTION.

**Medical Conditions Generally Aggravated by Exposure:** Ammonia is a respiratory irritant. Persons with impaired pulmonary function may be at increased risk from exposure.

## SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

**Steps To Be Taken In Case Material Is Released Or Spilled:**
**[Spills may need to be reported to the National Response Center (800/424-8802) DOT Reportable Quantity (RQ) is 100 pounds]** Do not apply water onto leaking tank. Stop the flow of gas or liquid. Wear full protective clothing and self-contained breathing apparatus. Use water to protect men effecting the shut-off. Approach from upwind. Dike liquid spills to contain liquid. Evacuate the area immediately. Eliminate all open flames in vicinity of indoor spills or released vapor. Water fog can be used to cleanse atmosphere of ammonia vapor. Downwind areas can be protected by water fog nozzles positioned downwind.

**Handling and Storing Precautions:** Protect against physical damage. Outside shaded area or detached storage is preferred. Inside storage should be in a cool, dry, well ventilated, noncombustible location, away from all possible sources of ignition. Separate from other chemicals, particularly oxidizing gases, chlorine, bromine, iodine, and acids. Avoid ingestion, inhalation, and contact with skin or eyes.

**Waste Disposal Methods:** Consult Federal, State, or Local Authorities for proper disposal procedures. If possible, allow spilled liquid ammonia to evaporate, as it is too volatile to absorb. Diking will contain the liquid and allow it to stabilize. Keep unprotected personnel away from area until it is free of ammonia. Do not apply water directly to ammonia liquid as this will cause boiling and splattering.

**Other Precautions:** Highly toxic to fish and aquatic life. Do not contaminate any body of water by direct application, cleaning of equipment, or disposal. Since ammonia is a fertilizer, it may promote eutrophication (high in nutrients, low in oxygen) in waterways.

**Product/Trade Name:** ANHYDROUS AMMONIA

## SECTION VIII - CONTROL MEASURES

**Respiratory Protection:** Unless ventilation is adequate to keep airborne concentrations below the exposure standard, wear approved respiratory protection such as an ammonia canister mask or an approved air supplied respirator. Canister or cartridge type masks must not be used above their exposure limits. Use self-contained breathing apparatus (SCBA) in an area where the exposure level is above the limit of canister or cartridge types masks. In an emergency use only self-contained breathing apparatus (SCBA) to enter areas of ammonia exposure.

**Ventilation:** Local exhaust is essential. Spark-proof fans desirable with mechanical ventilation. Ducts should be located at ceiling level and lead upwards to the outside.

**Protective Clothing:** Rubber or synthetic chemical gloves and boots; cotton clothing and underwear. Rubber or synthetic chemical coats or aprons should be available, an encapsulating chemical protective clothing garment is desirable for heavy exposures.

**Eye Protection:** Gas-tight chemical safety goggles must be worn if there is a likelihood of exposure. Persons subject to ammonia exposure must not wear contact lenses.

**Other Protective Clothing or Equipment:** Eyewash fountain and safety shower should be available in work area. The use of long sleeved clothing closed at the neck is advised. Change if clothing becomes contaminated.

## SECTION IX - SUPPLEMENTAL INFORMATION

**IDLH Value*:** 300 ppm

***The Immediately Dangerous to Life and Health Value**

**Section 313 Supplier Notification:** This product contains the following toxic chemical(s) subject to the reporting requirements of SARA Title III Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372.

| CAS # | CHEMICAL NAME | % BY WEIGHT |
|---|---|---|
| 7664-41-7 | AMMONIA | 100 |

**Environmental Impact:** Certain geographical areas have air pollution restrictions concerning use of Anhydrous Ammonia in work situations which may release Ammonia to the atmosphere. Air pollution regulations should be studied to determine if Anhydrous Ammonia is regulated in the area where it is to be used. In use and disposal of Anhydrous Ammonia, care must be taken to prevent contamination of water supplies. By increasing water alkalinity, it tends to diminish bacterial activity necessary for proper waste water treatment. Concentrations as low as 0.3 mg/l have been toxic to fish.

# P.P.E.
# What to Use When

Before selecting what P.P.E. to use you must quantify the hazards that may be present and consider the worst case scenario

In some cases the over selection of the level of protection may increase the risk to the entrants

# P.P.E.
# What To Use When

- Before Selecting What P.P.E. to Use You Must Quantify the Hazards That May Be Present and Consider the Worst Case Scenario

- In Some Cases The Over Selection of the Level of Protection May Increase the Risk to the Entrants

# Ammonia Basics

- **ALWAYS** considered a **FLAMMABLE** vapor

- **PRESSURE** and **TEMPERATURE** move in the **SAME** direction

- At room temperature **FROST** indicates the presents of **LIQUID**

# Ammonia Basics

- An operating system is **SAFER** than one that is shut down

- With the compressors shut down the pressure in the **LOWSIDE** will go **UP**

- To raise the pressure use **COMPRESSORS** or **HOT WATER**

- To lower pressure use **CONDENSER FANS**, and/or **SPRAYS** (COLD water)

- **COMPRESSORS** can be used to lower pressure in the **LOWSIDE**

- In order to have cooling you must have **FLOW**, **METERING**, and **LIQUID**

# Detection Methods

- Central Detection System
- Hand held meter
- Dreager tubes
- Sulfur candles
- Test paper

# P.P.E. For Ammonia

## HOW TO QUANTIFY:

- Get real measurements I area of release
- Observe the conditions in the area
- Know the working conditions in the area
- What will the task be?

# P.P.E. For Ammonia

## Respiratory Protection:

- < 35 ppm – Leave Area before 15 minute exposure
- 35 – 300 ppm – Canister Mask – (Check date)

  **Leave if you can smell ammonia or <u>after</u> 30 minutes**
- > 300 ppm – S.C.B.A. Required

# P.P.E. For Ammonia

## Normal Day to Day Tasks:

- Work uniform, with safety glasses, hearing protection, and bump cap
- Little or no chance of splashing liquid or liquid spray
- Little or no chance of unexpected vapor release

# P.P.E. For Ammonia

## Oil Draining and Oil Changes:

- Level D – With mask available until such time that the container is open to the air and the chance of an unexpected release is passes

- An escape mask should be kept near at all times when draining oil from a vessel containing liquid

# P.P.E. For Ammonia

## Minor Repairs and Adjustments:

- Work uniform with safety glasses, Hearing protection, and bump cap

- Limited to repairs that require only small hand tools – No visible liquid droplets

# P.P.E. For Ammonia

## Repairs That Require Larger Wrenches, Visible Vapor Leaks or Where Liquid Droplets are Present

- Level C

- If concentration is low enough (<35 ppm) a mask does not have to be worn but must be secured to the chest and the face piece secured by neck strap

# P.P.E. For Ammonia

## Ammonia Alarms:

- Check Ammonia detector display
- Check utilities control screen
- Get portable ammonia detector and take reading with out entering the room (while wearing a mask)
- Observe room for visible signs
- Select level or protection to use

# P.P.E. For Ammonia

**Visible Vapor Cloud or Measurable Level > 300 ppm:**

- Level B
- This company requires turnout gear under Level B

  Splash Protection

# P.P.E. For Ammonia

## Pooling Liquid:

- This company requires turnout gear under Level A

- Use of Level A inside the building should be the last resort to solving the problem

# High Side
# Our System

- Pipes and vessels painted ORANGE
- From the suction valve(s) on the Compressors(s) to the make-up valve(s) on the LPR
- Normal pressures from 75 to 250 p.s.i.g.
- Pressures outside this range – **There is something wrong-** Relief valves set at 300 p.s.i.g.

# High Side
# Our System

- Will contain **HOT HIGH PRESSURE VAPOR, WARM MEDIUM PRESSURE LIQUID,** or a mixture of both

- The condensers CONTROL the pressure on this part of the system

# Low Side Our System

- Pipes and Vessels are INSULATED
- From the make-up valve(s) on the LPR to the suction valve(s) on the compressor(s)
- NORMAL pressures 10 to 65 p.s.i.g.
- Compressors are primary pressure control

# Relief System and Other Details

- Piping is painted YELOW
- From the DUAL valve bodies to the DIFFUSERS above the roof
- Serves as EMERGENCY pressure control
- ALL vessels are protected
- Condenser Water piping and Sump Pump piping are painted GREEN
- EMERGENCY RELIEF BOX is located outside the main door on the East side of the building
- Sump pump controls are located in the ship, valves can be operated from outside

# WHERE ARE THESE ITEMS????

- Suction Valves
- Make-up Valves
- King Valve – Manual and Electric
- Liquid Pumps
- Manual Vent Valve – High and Low

# EMERGENCY RESPONSE TEAM QUIZ # 1

1. During AN evacuation the I.C. may shut off the alarms only after _____.

   a. The Process Team Leader gives the okay
   b. The pass-card holder gives the okay
   c. He/She is sure everyone is accounted for
   d. When he/she is tired of listening to them

2. The "all clear" to re-enter the building can be given after _____ .

   1. Fire Dept OIC
   2. The company IC
   3. The company Pass-card holder
   4. Production Manager
   5. Production Team Leader

   a. All of the above
   b. 1, 2 & 4
   c. 1, 4 & 5
   d. 1, 2 & 3
   e. 2, 3 & 5

3. The primary role of the ERT is to: _____ .

   a. Reduce insurance rates
   b. Insure the safety of the employees
   c. Help put out fires
   d. All of the above

4. In order for Production to resume after an alarm _____ .

   1. The alarm system must be functional
   2. The sprinkler system must be functional
   3. The I.C. must give the okay to the Process TL
   4. All of the above

   a. 1 or 2, 3
   b. 1, 2 & 3
   c. 3
   d. 4

5. T or F According to OSHA records ammonia is the leading cause of death in the Food Industry.

6. T or F If there is an alarm, the cause must be identified.

7. T or F This Company requires Fire Resistant / Insulating clothing under Level A or B response suits when dealing with ammonia.

8. If during an Emergency Response a situation comes up that you are uncomfortable with you should: _____ .

   a. Clam-up, it's part of your job
   b. Stop and voice your concerns with the other Team members before proceeding
   c. Tell the pass-card holder "You get the big bucks, you go in!"
   d. Don't worry there is nothing here that can hurt you.

9. T or F On our SCBAs the Red Knob opens the air to the regulator.

10. T or F On our SCBAs the Gold Knob opens the bypass.

11. T or F Because we have full face canister type ammonia masks, they are safe to use at any concentration of ammonia.

12. Because of the design of the plant, the sprinkler system, the alarm system and the training of the ERT any fire at this facility will probably be _____ .

    a. Very small with the water damage greater than the fire damage
    b. Very severe with the likely loss of an entire area of the plant
    c. An average Industrial Fire with $100,000 damage
    d. Either very small with the water damage greater than the fire damage or very severe with the likely loss of an entire area of the plant

13. Which of the following is <u>not</u> on the list of what the ERT will do? _____

    1. Insure an orderly evacuation
    2. Account for people
    3. Take an active role in fire fighting
    4. Identify the problem
    5. Locate the problem
    6. Interface with outside Agencies
    7. Document our actions
    8. Put the safety of others and the plant ahead of our personal safety

    a. 1, 6 & 7
    b. 3, 7
    c. 3, 8
    d. none of the above

14. T or F As a member of the ERT, I should never enter an area that contains dangers that I am not trained for or equipped to deal with.

15. T or F The tools we will use to make the ERT work are Training, Planning, SOPs, Practice, and drills.

16. T or F Any time the alarms are sounding in an area everyone must evacuate.

17. T or F A "Level A" suit is one that is fully encapsulating and is different from "Level B" because the SCBA is outside the suit.

18. T or F Plant ERT Members are only authorized to service the high pressure side of SCBA equipment.

19. SCBAs must be inspected:

1. Weekly
2. Monthly
3. After each use
4. Once each year by a certified technician

a. 1 & 3
b. 2 & 3
c. 1, 2 & 4
d. 1, 2, 3 & 4

20. You are here on a weekend, the guard calls on the radio to say he has alarm #L5M15 on the display (propane tank flame detector) Which of the following should you <u>not</u> do:

1. Evacuate the plant
2. Contact the Fire Department
3. Activate Sprinkler System
4. Call Larry and Dan
5. Try to identify the source (go look)
6. Turn radio to channel 2 after notifying other ERT members

a. 2, 5
b. 2, 4
c. All should be done
d. 1, 5

# APPENDIX E

## Training Module and Leader's Guide for First Aid

First Aid Training Module

## Course Description

This course focuses on the knowledge, skills and aptitudes needed to assess the scene of an emergency and apply the proper medical First Aid to injured individuals.

## Goals of the Course

The goal of the course is to have participants practice the skills that are useful in medical First Aid and have application to the industrial environment.

## Objectives of the Course

Upon completion of the course, participants will be able to:

1. Complete a primary survey of the scene of an accident.
2. Identify signs & symptoms of Hypovolemic Shock
3. Identify signs & symptoms of Fainting
4. Identify signs & symptoms of severe Allergic Reactions
5. Identify signs & symptoms of Internal Bleeding
6. Identify signs & symptoms of a Skull Fracture
7. Identify signs & symptoms of Concussions and Contusions
8. Identify signs & symptoms of Abdominal Injuries
9. Identify signs & symptoms of and apply First Aid for Spinal Injuries
10. Demonstrate First Aid techniques for Controlling Bleeding
11. Demonstrate First Aid techniques for injuries to the Head, Eyes, Mouth, and Chest.
12. Demonstrate First Aid techniques for Inhalation of Poison, Burns, Fractures, and Muscle Injuries
13. Demonstrate First Aid techniques for Diabetic Emergencies and Seizures
14. Demonstrate First Aid techniques in bandaging and splinting

## Course Materials

1. First Aid Training Book

## Units of Instruction

I. Primary Survey and Giving Information over the Phone

II. Shock, Fainting, and Severe Allergic Reaction

III. Internal Bleeding and Controlling external Bleeding

IV. Skull Fractures, Concussions, and Contusions

V. Specific Body Area Injuries and Inhaled Poison

VI. First Aid for Burns

VII. Bone, Joint, and Muscle Injuries

VIII. Spinal Injuries

VIIII. Diabetic Emergencies and Seizures

X. Bandaging and Splinting

**Leader's Guide**
First Aid Training

# Unit 1 – Primary Survey and Giving Information over the Phone

| Time (minutes) | | |
|---|---|---|
| | ***Introduction*** | |
| 2 | Introduce the unit topic | |
| 2 | Hand out First Aid Training Manual | |
| | ***Discussion*** | |
| 2 | Discuss the information about the victim to be given over the phone | |
| 5 | Discuss the Good Samaritan Law | |
| 10 | ***O*** | Use overhead to discuss the flow of Primary Survey |
| 2 | **?** | ASK: What is the first thing to check for when approaching the victim? |
| | Follow the flow of the chart | |
| 10 | **?** | ASK: What is normal vs. abnormal in doing a physical exam? |
| | Give examples | |
| | ***Review*** | |
| 5 | Briefly review the unit material | |
| | ***Conclusion*** | |
| 5 | **?** | ASK: Are there any questions about the material covered in this unit? |

# Unit 2 – Shock, Fainting, and Sever Allergic Reaction

| Time (minutes) | |
|---|---|
| | ***Introduction*** |
| 2 | Introduce the unit topic |
| | ***Discussion*** |
| 5 | Discuss signs and symptoms of Hypovolemic Shock |
| 2 | ? ASK: How can you prevent shock? |
| 5 | Observe the flow chart on Hypovolemic Shock |
| 2 | Discuss signs and symptoms of Fainting |
| 2 | ? ASK: What causes fainting? |
| 2 | Observe the flow chart on Fainting |
| 2 | Discuss signs and symptoms of Severe Allergic Reaction |
| 2 | ? ASK: What can cause a severe allergic reaction? |
| 2 | Observe the flow chart on Severe Allergic Reaction |
| | ***Review*** |
| 5 | Briefly review material |
| | ***Conclusion*** |
| 5 | ? ASK: Are there any questions about the material covered in this unit? |

# Unit 3 – Internal Bleeding and Controlling external Bleeding

| Time (minutes) | |
|---|---|
| | ***Introduction*** |
| 2 | Introduce the unit topic |
| | ***Discussion*** |
| 2 | Discuss signs and symptoms of internal bleeding |
| 2 | ? ASK: What could cause internal bleeding? |
| 5 | Observe the flow chart on bleeding |
| 2 | ? ASK: What could cause external bleeding? |
| 5 | ? ASK: What can be done to control external bleeding? |
| 5 | Discuss the disadvantages of using a tourniquet |
| 10 | Demonstrate how to control external bleeding using bandages and pressure |
| 15 | Have participants practice on each other |
| | ***Review*** |
| 5 | Briefly review material |
| | ***Conclusion*** |
| 5 | ? ASK: Are there any questions about the material covered in this unit? |

# Unit 4 – Skull Fractures, Concussions, and Contusions

| Time (minutes) | |
|---|---|
| | ***Introduction*** |
| 2 | Introduce the unit topic |
| 5 | Discuss signs and symptoms of a Skull Fracture |
| 2 | ? ASK: What could cause a skull fracture? |
| 5 | Discuss signs and symptoms of a Concussion |
| 2 | ? ASK: What could cause a concussion? |
| 2 | ? ASK: How are concussions detected? |
| 5 | Discuss signs and symptoms of a Contusion |
| 5 | ? ASK: How are a concussion and a contusion different? |
| | ***Review*** |
| 5 | Briefly review material |
| | ***Conclusion*** |
| 5 | ? ASK: Are there any questions about the material covered in this unit? |

# Unit 5 – Specific Body Area Injuries and Inhaled Poison

| Time (minute) | |
|---|---|
| | ***Introduction*** |
| 2 | Introduce the unit topic |
| | ***Discussion*** |
| 2 | ? ASK: What types of head injuries are there? |
| 5 | Discuss the mechanism of head injuries |
| 5 | Observe the flow chart for Head Injury first aid |
| 2 | ? ASK: What types of eye injuries are there? |
| 5 | Discuss the mechanism of eye injuries |
| 5 | Observe the flow chart for Eye Injury first aid |
| 2 | ? ASK: What types of dental injuries are there? |
| 2 | Discuss the mechanism of dental injuries |
| 5 | Observe the flow chart for Dental Injury first aid |
| 5 | ? ASK: What types of chest injuries are there? |
| 2 | Discuss the mechanism of chest injuries |
| 5 | Observe the flow chart of Chest Injury first aid |
| 5 | ? ASK: What types of abdominal injuries are there? |
| 5 | Discuss signs and symptoms of abdominal injuries |
| 5 | Observe flow chart for Abdominal Injury first aid |
| 5 | ? ASK: What poisonous vapors are at this plant? |
| 5 | Observe flow chart for Inhaled Poison first aid |

***Review***

5 Briefly review material

***Conclusion***

5 ? ASK: Are there any questions about the material covered in this unit?

# Unit 6 – First Aid for Burns

| Time (minutes) | |
|---|---|
| | ***Introduction*** |
| 2 | Introduce the unit topic |
| | ***Discussion*** |
| 2 | ? ASK: What types of burns are there? |
| 5 | Discuss the appearance of a First-degree burn |
| | First aid for First-degree burn |
| 2 | ? ASK: What would cause a First-degree burn? |
| 5 | Discuss the appearance of a second-degree burn |
| | First aid for Second-degree burn |
| 2 | ? ASK: What would cause a Second-degree burn? |
| 5 | Discuss the appearance of a third-degree burn |
| | First aid for Third-degree burn |
| 5 | Observe flow chart for Heat Burn first aid |
| 2 | ? ASK: What would cause a Third-degree burn? |
| 5 | Discuss the different types of Chemical burns |
| 5 | ? ASK: What are some Chemicals in the plant that could cause burns? |
| | First aid for Chemical burns |
| 2 | Observe flow chart for Chemical Burn first aid |
| 2 | Discuss the appearance of Electrical Burns |
| 5 | ? ASK: What in this plant could cause an Electrical Burn? |

2 Observe flow chart for Electrical Injury first aid

5 Discuss Heat Related Emergencies

5 ? ASK: What areas of the plant have the potential to cause a heat related emergency?

5 ? ASK: What is the difference between Heat Exhaustion and Heat Stroke?

5 Observe the flow chart for Heat Related Emergency first aid

***Review***

5 Briefly review material

***Conclusion***

5 ? ASK: Are there any questions about the material covered in this unit?

# Unit 7 – Bone, Joint, and Muscle Injuries

| Time (minutes) | |
|---|---|
| | ***Introduction*** |
| 2 | Introduce the unit topic |
| | ***Discussion*** |
| 2 | ? ASK: What types of fractures are there? |
| 5 | ? ASK: What can cause a fracture? |
| 2 | Discuss signs and symptoms of fractures |
| 5 | Observe the flow chart for Fracture first aid |
| 2 | ? ASK: What types of muscle injuries are there? |
| 2 | ? ASK: What can cause a muscle injury? |
| 5 | Observe the flow chart for Muscle Injury first aid |
| 10 | Discuss the differences between Strains, Contusions, Sprains, and Dislocations |
| 2 | ? ASK: What can cause a Dislocation? |
| 2 | ? ASK: What can cause a Sprain? |
| 5 | Observe the flow chart for Sprains, Strains, Contusions, Dislocations first aid |
| | ***Review*** |
| 5 | Briefly review material |
| | ***Conclusion*** |
| 5 | ? ASK: Are there any questions about the material covered in this unit? |

# Unit 8 – Spinal Injuries

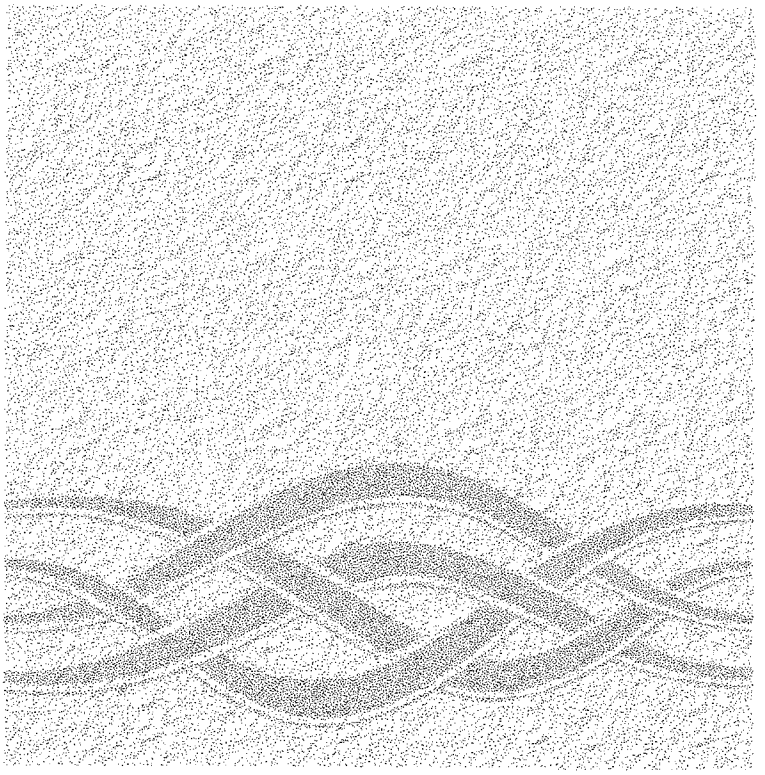
| Time (minutes) | |
|---|---|
| | ***Introduction*** |
| 2 | Introduce the unit topic |
| | ***Discussion*** |
| 5 | Discuss signs and symptoms of a Spinal Injury |
| 2 | ? ASK: What could cause a spinal injury? |
| 5 | Observe the flow chart for Spinal Injury first aid |
| 5 | Demonstrate a victim body drag |
| 5 | Demonstrate immobilization of victim |
| 10 | Give participants the opportunity to practice these two techniques |
| | ***Review*** |
| 5 | Briefly review material |
| | ***Conclusion*** |
| 5 | ? ASK: Are there any questions about the material covered in this unit? |

# Unit 9 – Diabetic Emergencies and Seizures

| Time (minutes) | |
|---|---|
| | ***Introduction*** |
| 2 | Introduce unit topic |
| | ***Discussion*** |
| 2 | Discuss signs and symptoms of a diabetic emergency |
| 2 | ? ASK: What is the difference between a diabetic coma and insulin shock? |
| 5 | Observe flow chart for Diabetic Emergency first aid |
| 2 | Demonstrate placing small amount of sugar under victim's tongue |
| 5 | Allow participants to practice technique on each other |
| 2 | Discuss sings of a seizure |
| 2 | ? ASK: What causes seizures? |
| 2 | ? ASK: What types of seizures are there? |
| 5 | Observe flow chart for first aid for Seizures |
| 2 | ? ASK: Why are victims turned onto their side while they are seizing? |
| 5 | Demonstrate turning victim on their side to recovery position |
| 5 | Allow participants to practice this technique on each other |
| | ***Review*** |
| 5 | Briefly review material |
| | ***Conclusion*** |
| 5 | ? ASK: Are there any questions about the material covered in this unit? |

# Unit 10 – Bandaging and Splinting

| Time (minutes) | |
|---|---|
| | ***Introduction*** |
| 2 | Introduce the unit topic |
| | ***Discussion*** |
| 2 | Discuss the types of bandages used for first aid |
| 2 | ? ASK: What types of injuries require bandaging? |
| 5 | Demonstrate the application of Roller Bandage for Hand |
| 5 | Demonstrate the application of Roller Bandage for Foot |
| 10 | Allow participants to practice technique on each other |
| 2 | ? ASK: What areas of the body would you apply a splint or sling? |
| 5 | Demonstrate the technique for creating an arm and clavicle sling |
| 5 | Demonstrate the technique for creating a forearm (radius/ulna) sling |
| 5 | Demonstrate the technique for creating a lower leg (tibia/fibula) splint |
| 5 | Demonstrate the technique for creating a thigh (femur) splint |
| 5 | Demonstrate the technique for creating an ankle/foot splint |
| 5 | Demonstrate the technique for creating a self splint for fingers and toes |
| 20 | Allow participants to practice technique on each other |
| | ***Review*** |
| 5 | Briefly review material |
| | ***Conclusion*** |
| 5 | ? ASK: Are there any questions about the material covered in this unit? |



# FIRST-AID TRAINING

# *Level 1 First Aid*

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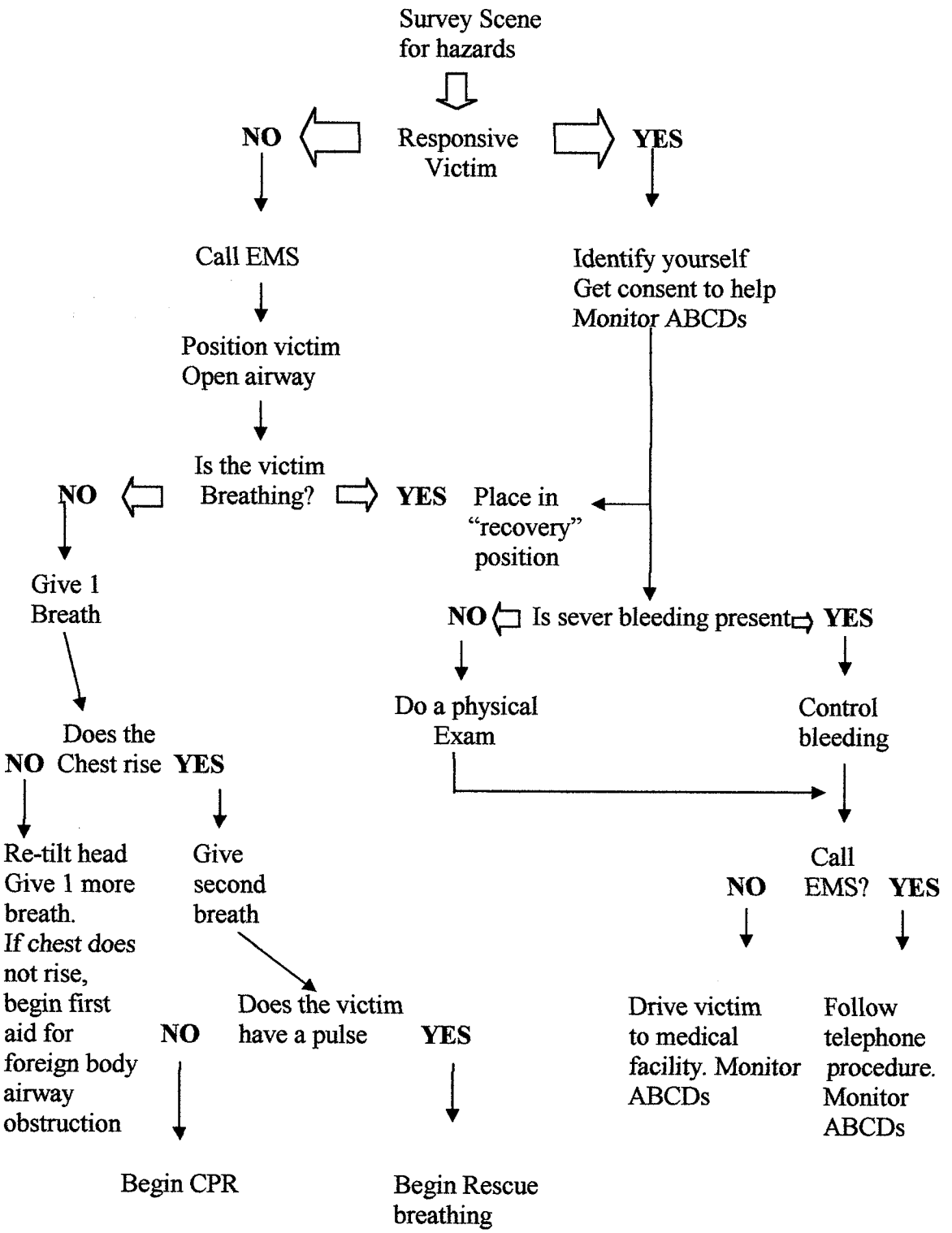
Giving Information Over the Phone:

- Victim's location
- Your phone number
- What has happened
- Number of persons needing help and any special conditions
- Condition of the victim(s)
- What is being done for the victim(s)

Always be the last to hang up the phone

# *PRIMARY SURVEY*



# *Level 1 First Aid*

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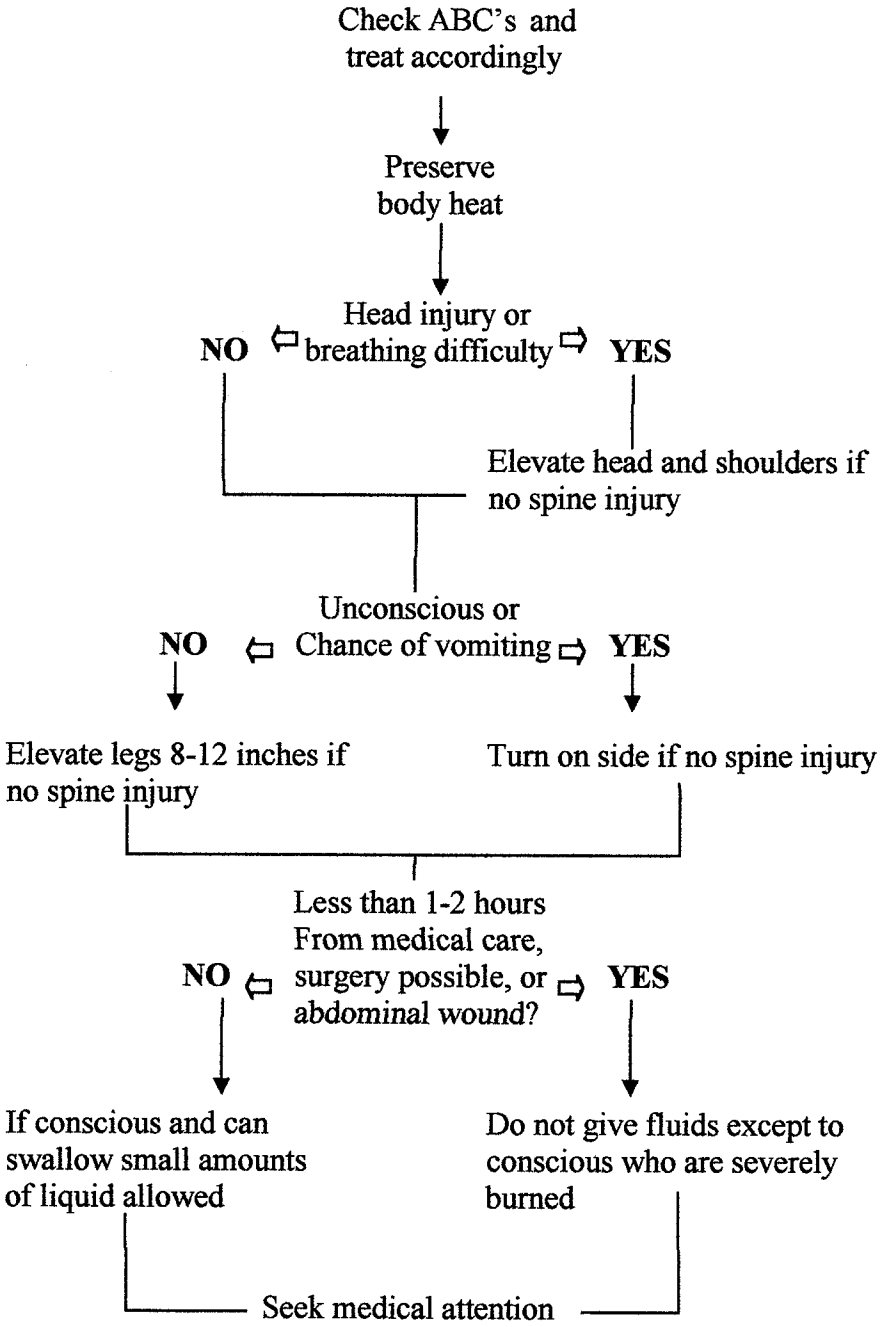
## Hypovolemic Shock

### Signs & Symptoms

- Pale or bluish skin, nailbed, and lips
- Slow capillary filling time
- Cool, wet (clammy) skin: heavy sweating
- Rapid breathing and pulse
- Dilated (enlarged) pupils
- Dull, sunken look to the eyes
- Thirst
- Nausea and vomiting
- Loss of consciousness in severe shock

**A first aider can prevent shock but not reverse it**

# HYPOVOLEMIC SHOCK



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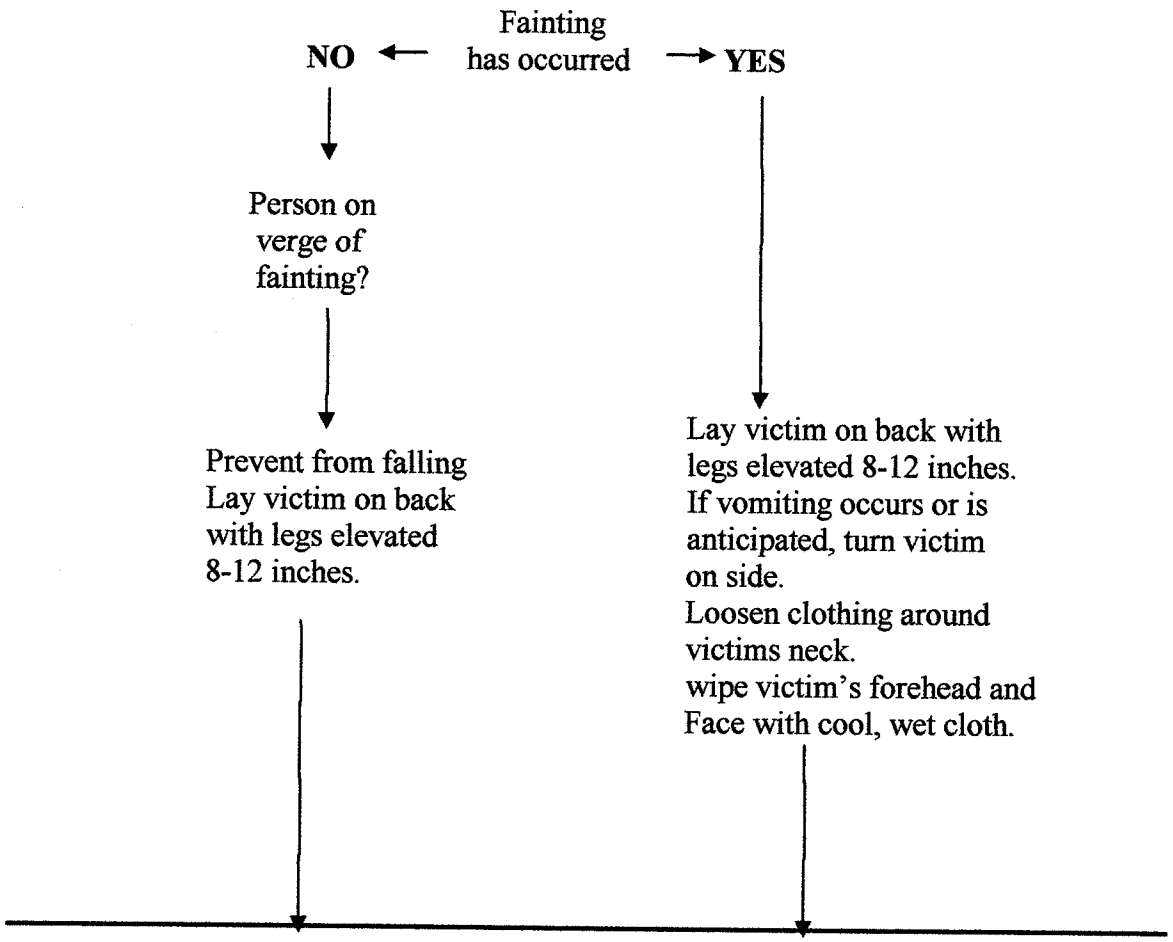
## Fainting

### Sings & Symptoms

- Dizziness
- Seeing spots
- Nausea
- Paleness
- Sweating

# FAINTING




Seek medical attention if victim:

- Is over 40 years old
- Has repeated attacks of unconsciousness
- Loses consciousness while sitting or lying down
- Faints for no apparent reason

# Level 1 First Aid

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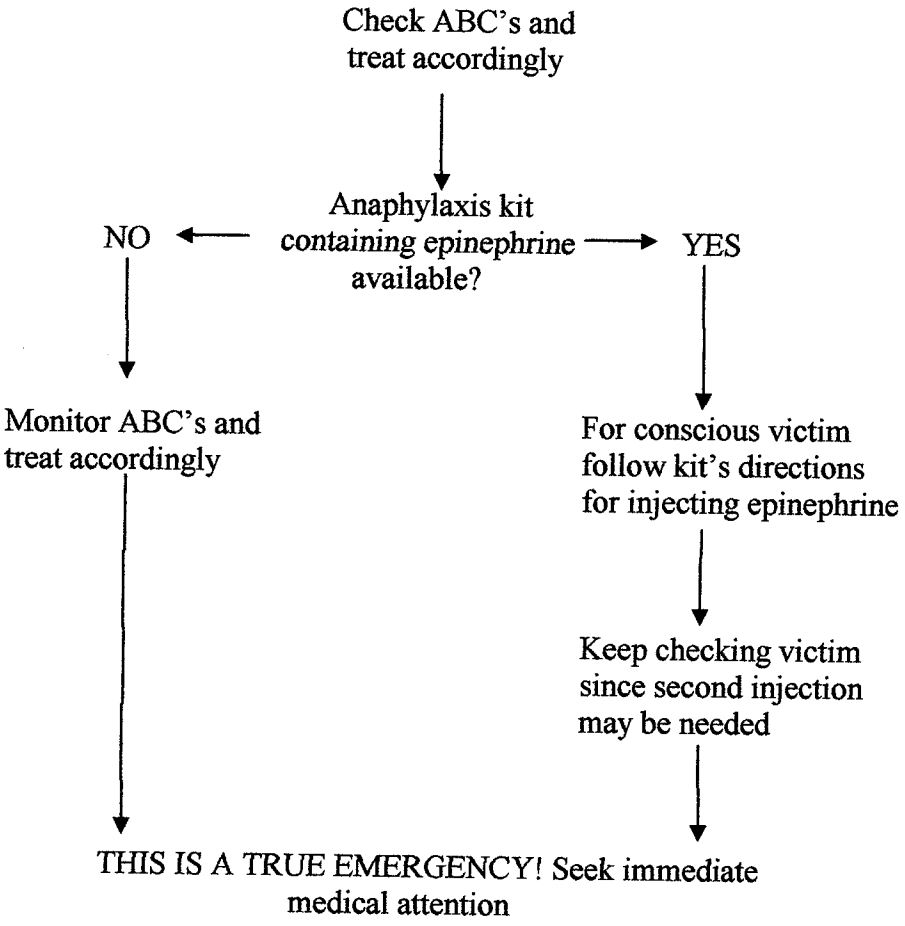
## Severe Allergic Reaction

### Signs & Symptoms

- Wheezing or difficult breathing
- Tightness and swelling in the throat
- Tightness in the chest
- Severe itching, burning, rash, or hives
- Swollen face, tongue, mouth
- Nausea and vomiting
- Dizziness
- Abdominal cramps
- Blueness around the lips and mouth
- Unconsciousness

# SEVERE ALLERGIC REACTION



# *Level 1 First Aid*

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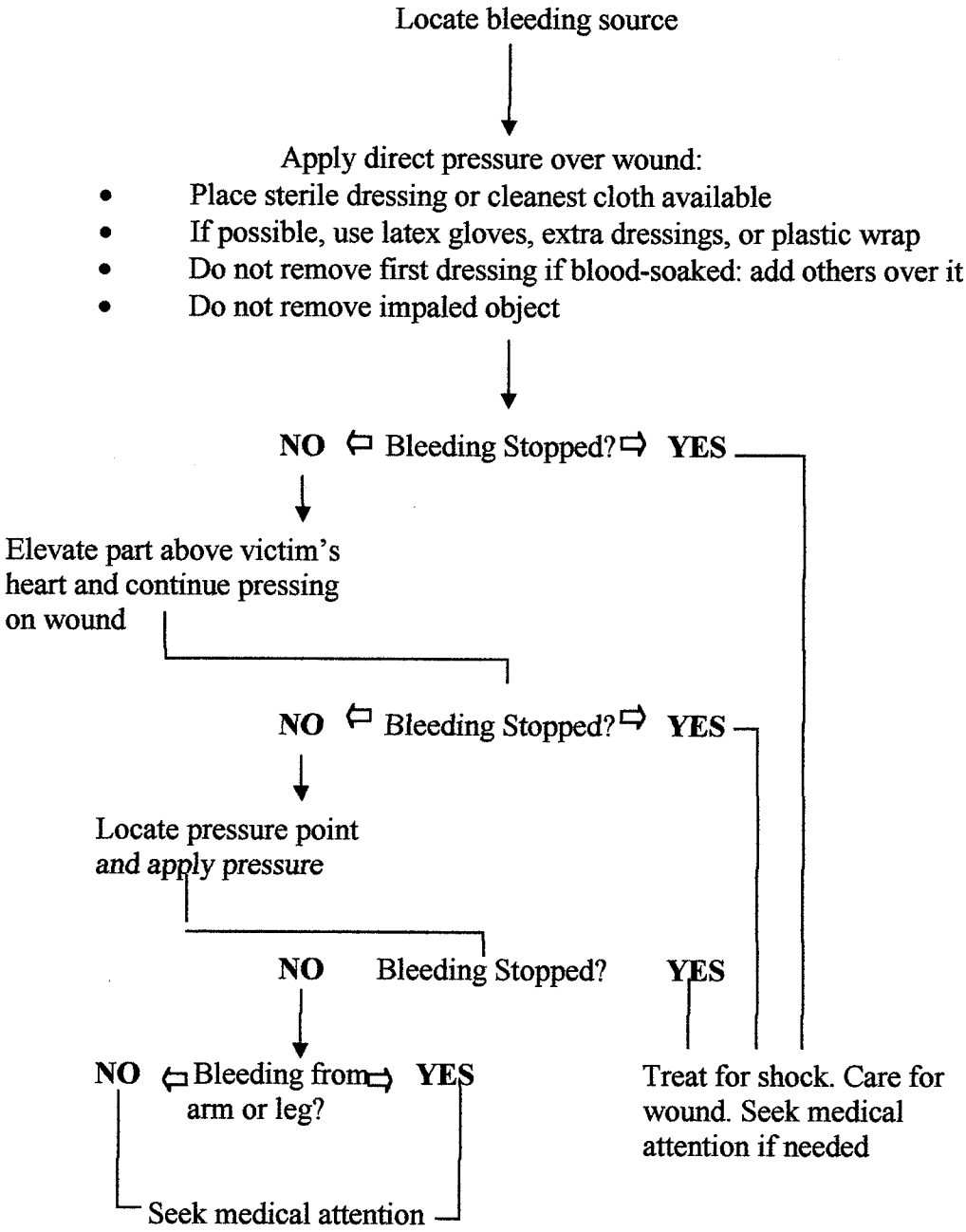
## Internal Bleeding

### Signs & Symptoms

- Blood from the mouth (vomit) or rectum, or blood in the urine
- Non-menstrual bleeding from the vagina
- Bruising or contusions
- Rapid pulse
- Cold and moist skin
- Dilated pupils
- Nausea and vomiting
- Pain, tender, rigid, bruised abdomen
- Fractured ribs or bruises on chest

## BLEEDING


Locate bleeding source
Apply direct pressure over wound:
• Place sterile dressing or cleanest cloth available
• If possible, use latex gloves, extra dressings, or plastic wrap
• Do not remove first dressing if blood-soaked: add others over it
• Do not remove impaled object
NO ⇦ Bleeding Stopped? ⇨ YES
Elevate part above victim's heart and continue pressing on wound
NO ⇦ Bleeding Stopped? ⇨ YES
Locate pressure point and apply pressure
NO Bleeding Stopped? YES
NO ⇦ Bleeding from arm or leg? ⇨ YES
Seek medical attention
Treat for shock. Care for wound. Seek medical attention if needed

# Level 1 First Aid

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## Skull Fracture

### Signs & Symptoms

- Pain at the point of injury
- Deformity of the skull
- Bleeding from ears & or nose
- Leakage of clear or pink watery fluid dripping from the nose or ears (Spinal fluid)
- Discoloration under the eyes (raccoon eyes)
- Discoloration behind an ear (battle's sign)
- Unequal pupils
- Profuse scalp bleeding if skin is broken. May expose skull or brain tissue

# Level 1 First Aid

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## Concussion

### Signs & Symptoms

- Loss of consciousness
- Severe headache
- Memory loss
- Seeing stars
- Dizziness
- Weakness
- Double vision

# Level 1 First Aid

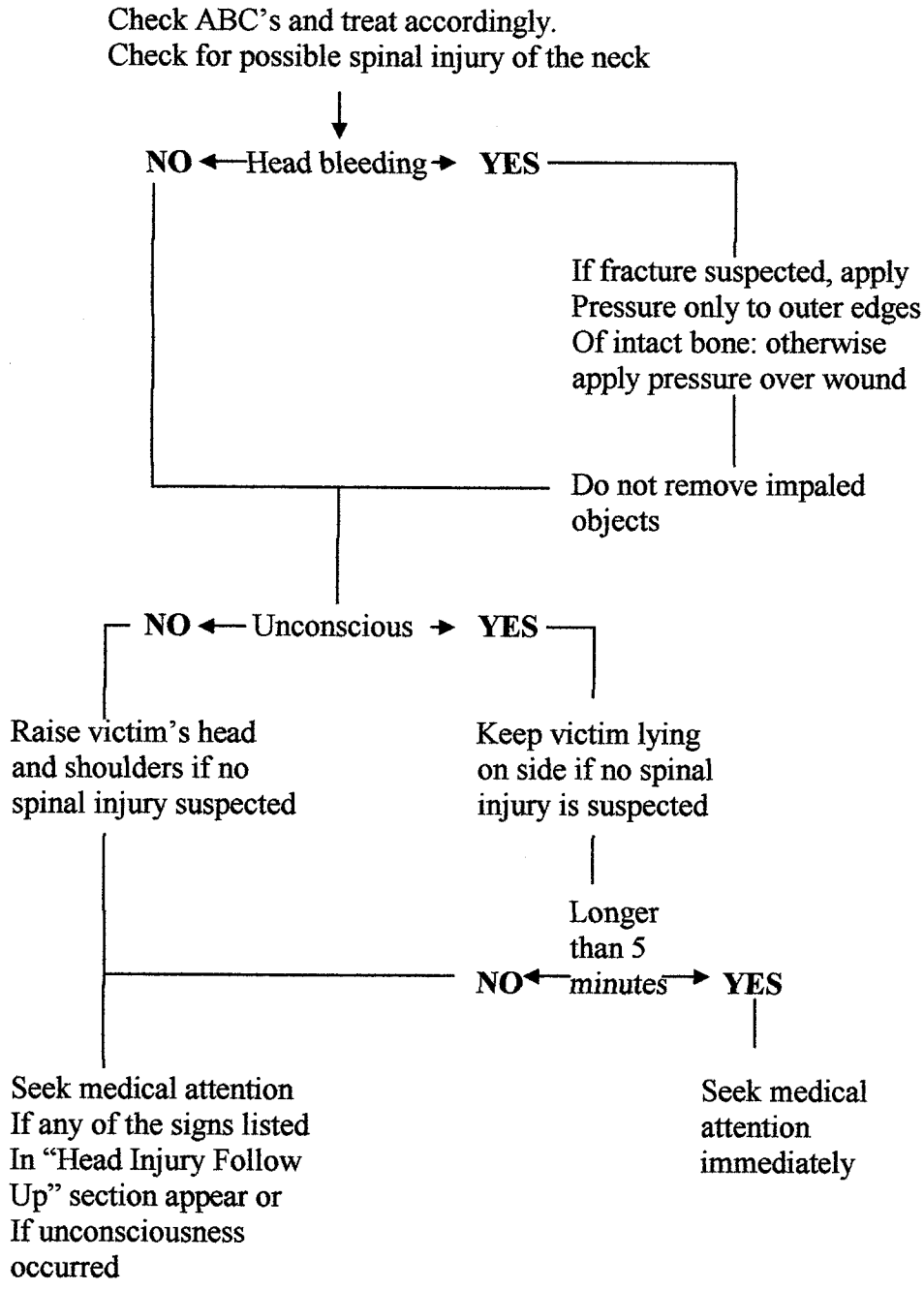
---

## Contusion

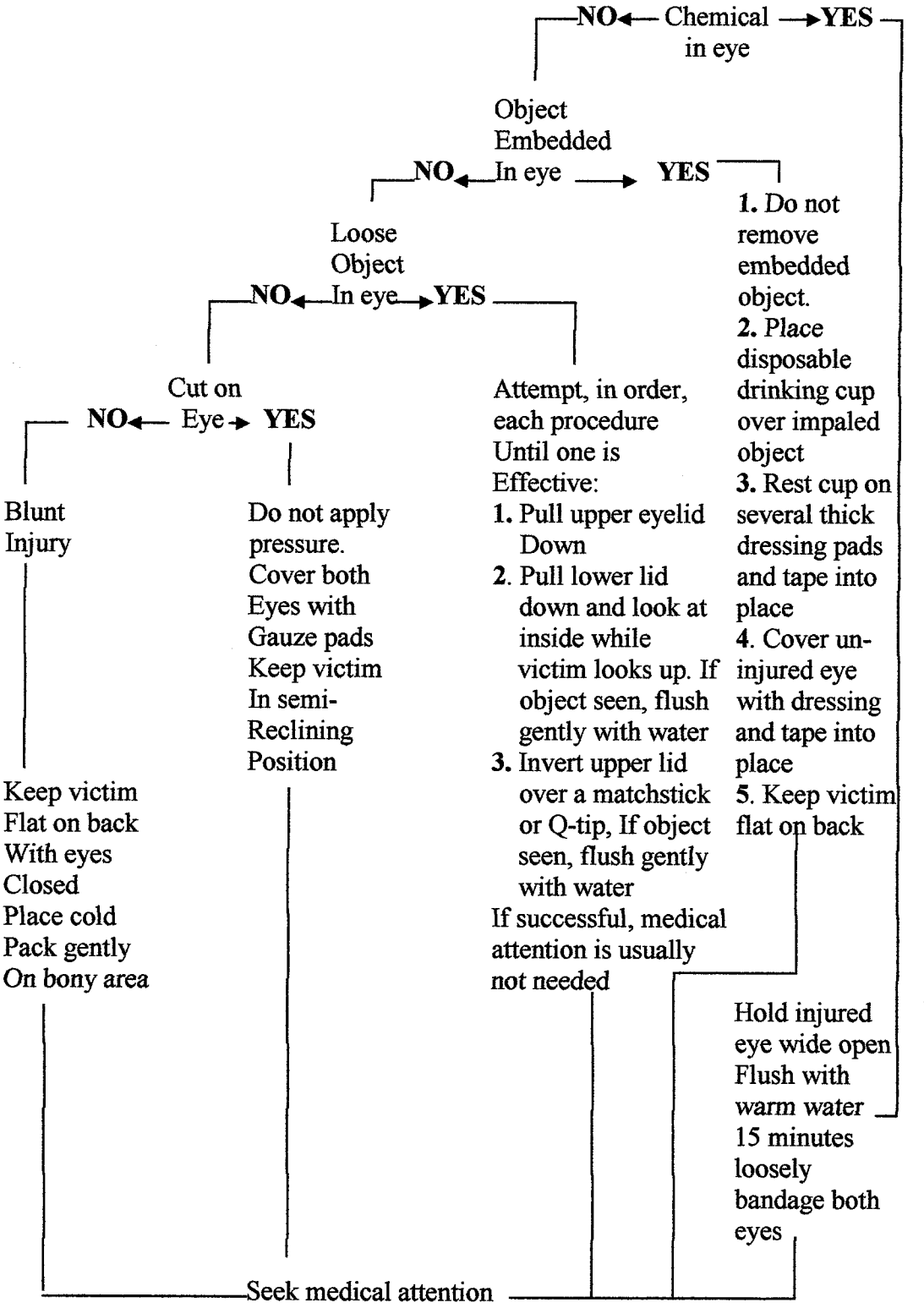
### Signs & Symptoms

- Similar to those of a concussion but more severe
- Unconsciousness
- Paralysis or weakness
- Unequal pupil size
- Vomiting and nausea
- Blurred vision
- Amnesia or memory lapses
- Headache

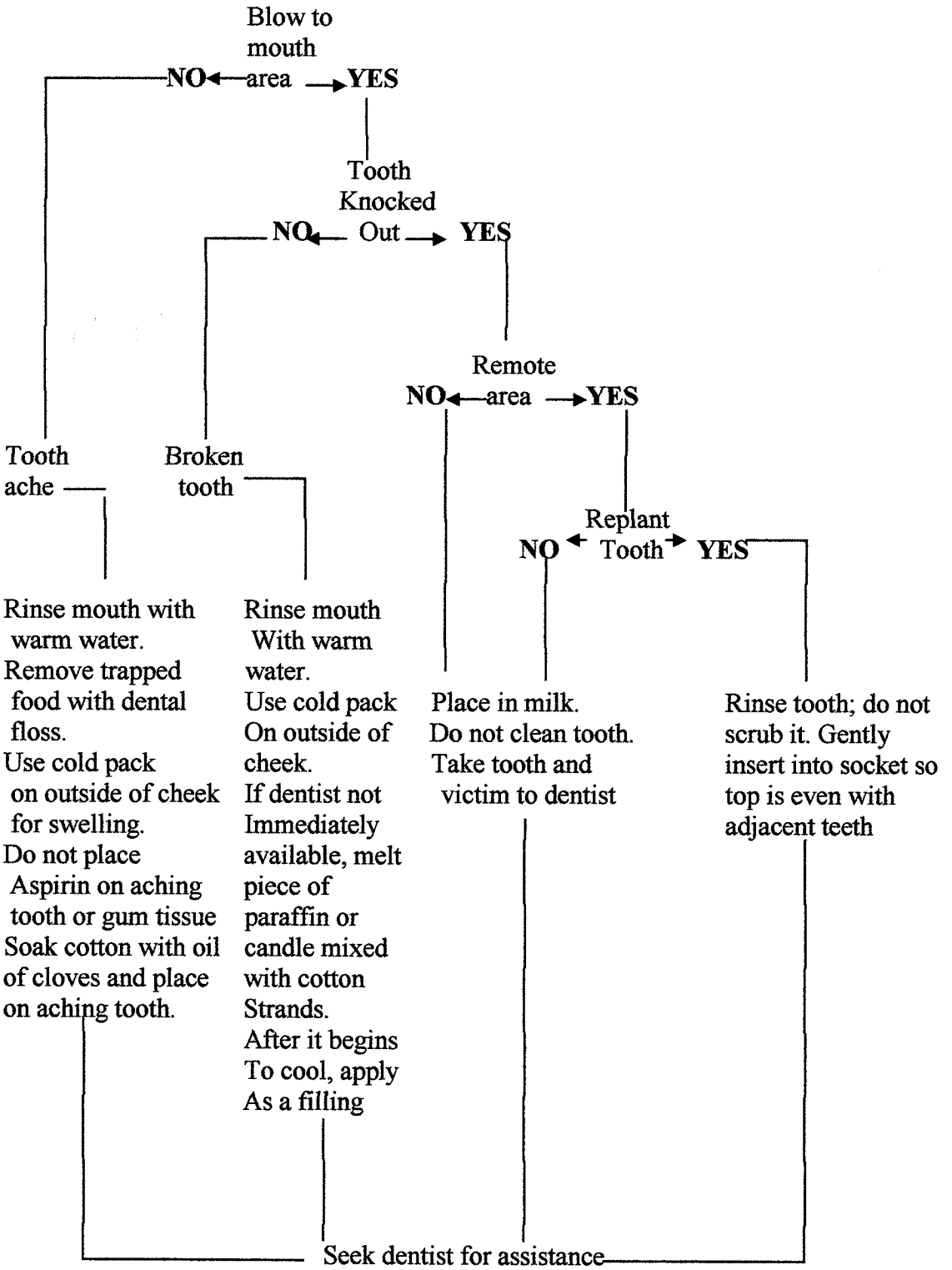
# HEAD INJURIES



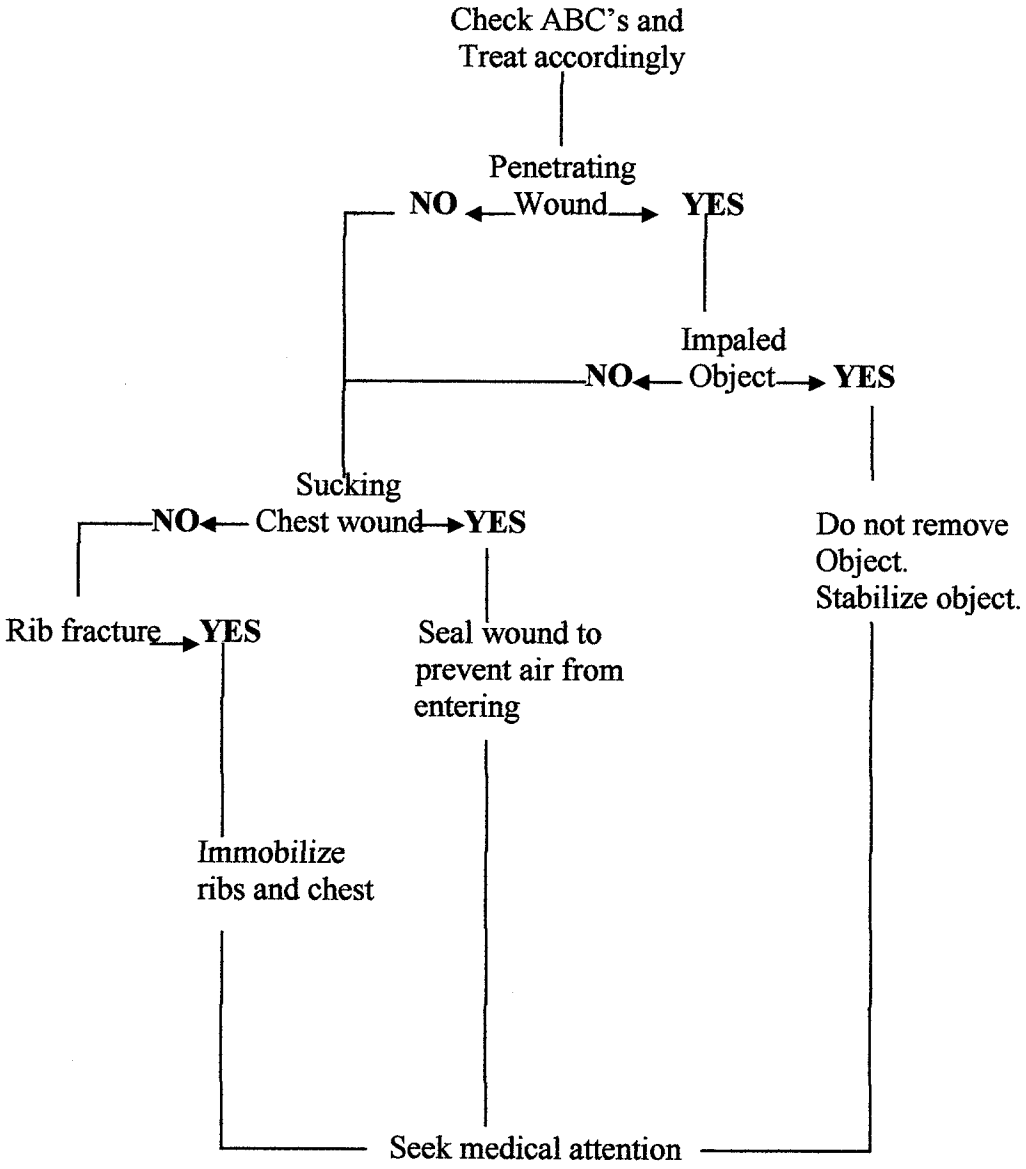
# EYE INJURIES



# DENTAL INJURIES



# CHEST INJURIES



# *Level 1 First Aid*

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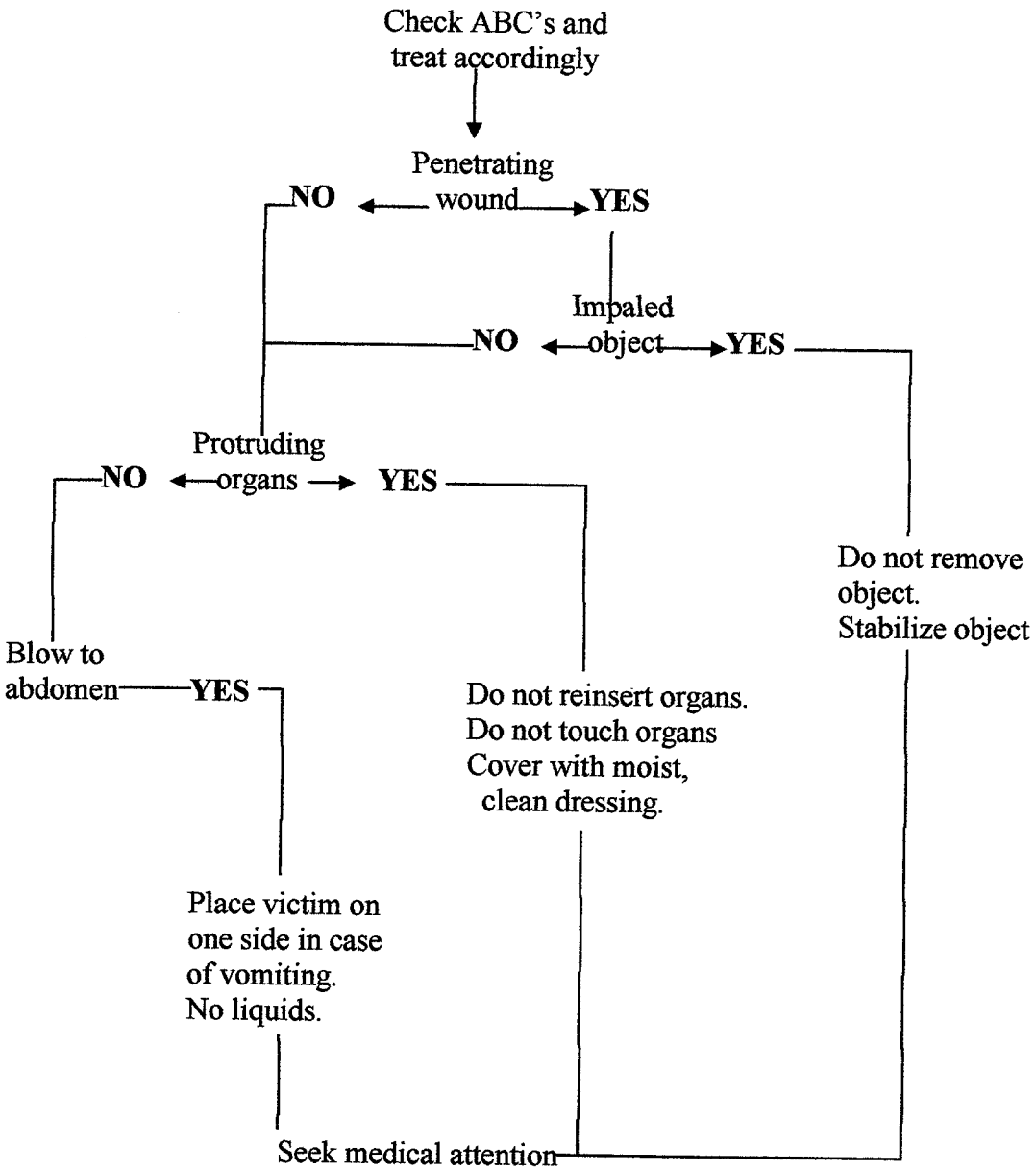
## Abdominal injuries

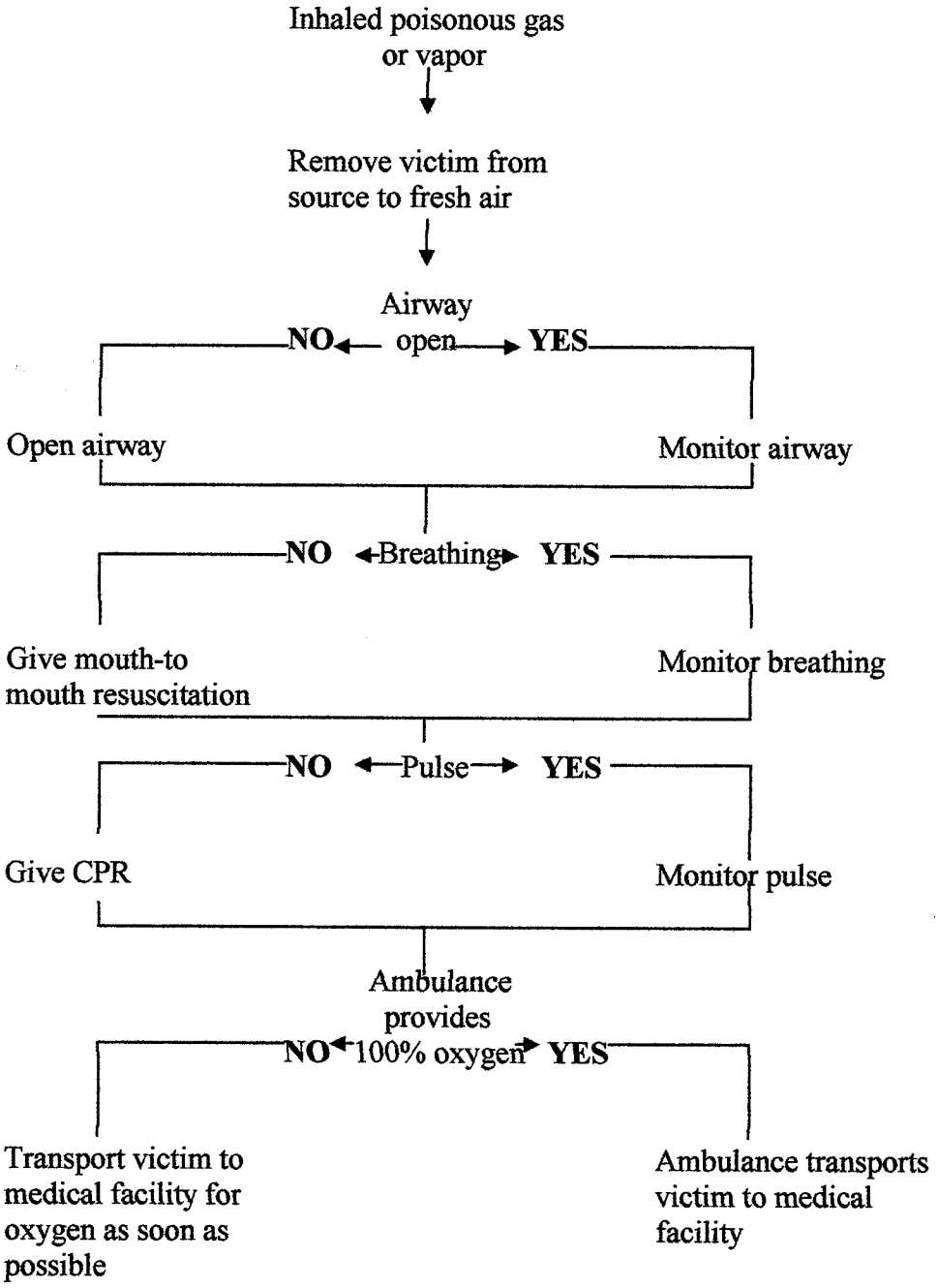
## Sings & Symptoms

- Pain in the abdomen, which may involve cramping
- Legs drawn up to the chest
- Skin wounds and penetrations
- Nausea and vomiting
- Protruding organs
- Blood in the urine or stool
- Guarding abdomen
- Rapid pulse
- Moist, cold skin

# ABDOMINAL INJURIES



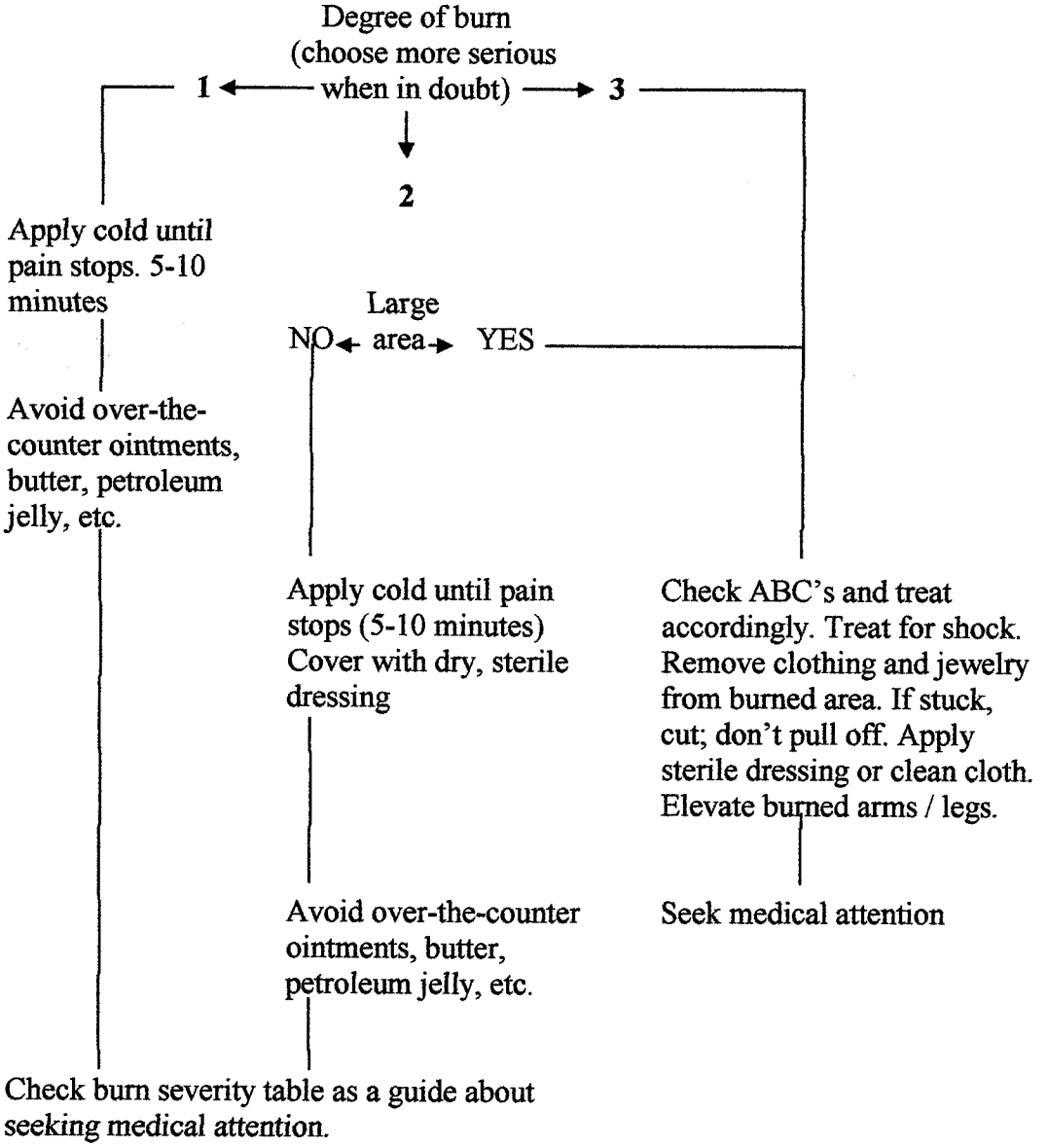
# INHAILED POISON



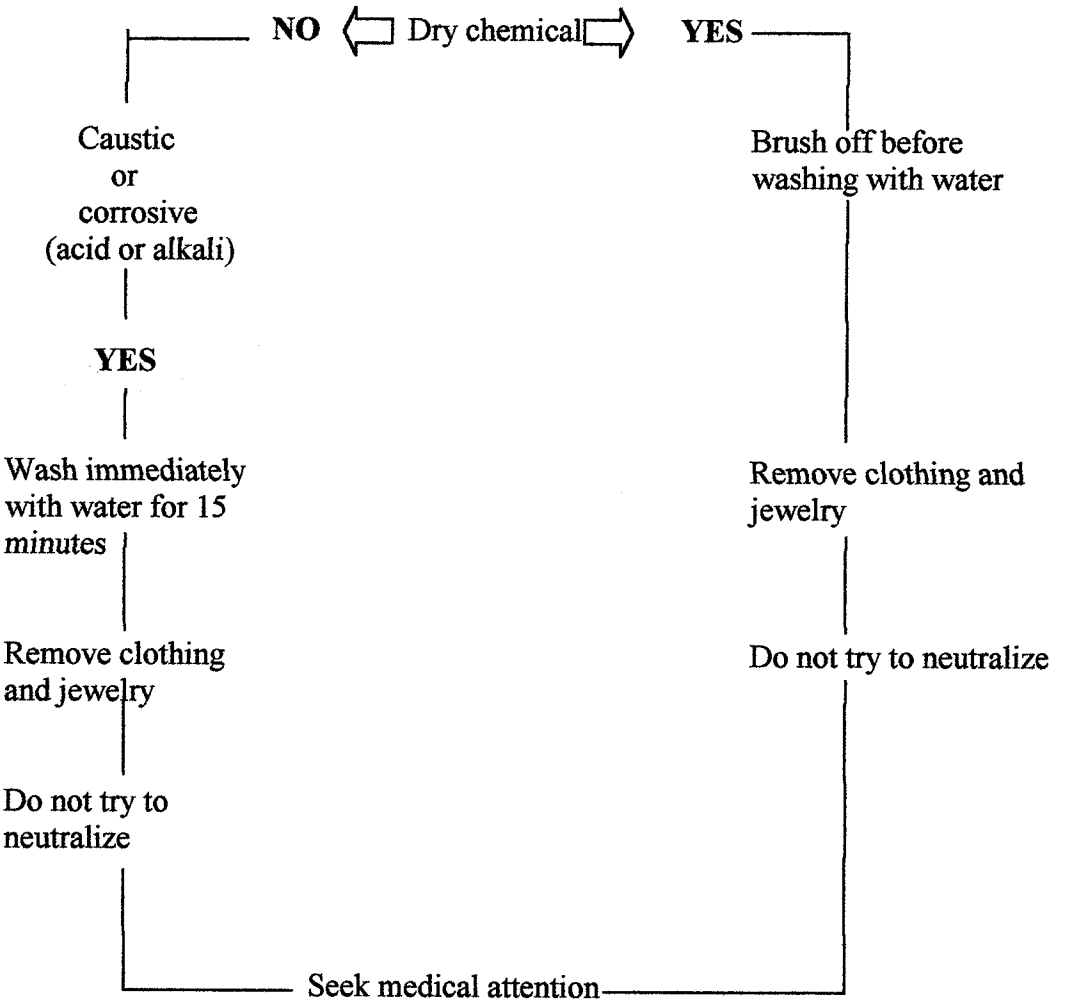
# FIRST AID FOR BURNS

| Burn | Do | Don't |
|---|---|---|
| First-degree (*redness, mild swelling, pain)* | Apply cold water and/or dry sterile dressing | Apply butter, margarine, etc.. |
| Second-degree (*deeper; blisters develop)* | Immerse in cold water, blot dry with sterile cloth. Treat for shock, Obtain medical attention if severe. | Break blisters. Remove shreds of tissue. Use antiseptic preparations or home remedies. |
| Third-degree (*deeper destruction; skin layers & muscle tissue destroyed)* | Cover with sterile cloth to protect. Treat for shock. Watch for difficult breathing. Obtain medical attention. | Remove charred clothing that is stuck to burn. Apply ice or home medications. |
| Chemical Burn (*Liquid)* | Remove by flushing with quantities of water for at least 15 minutes. Remove surrounding clothing. Obtain medical attention. | |
| Chemical Burn (*dry powder)* | Remove by brushing off chemical powder thoroughly. Remove all contaminated clothing. Obtain medical attention. | Activate chemical by flushing with water. |

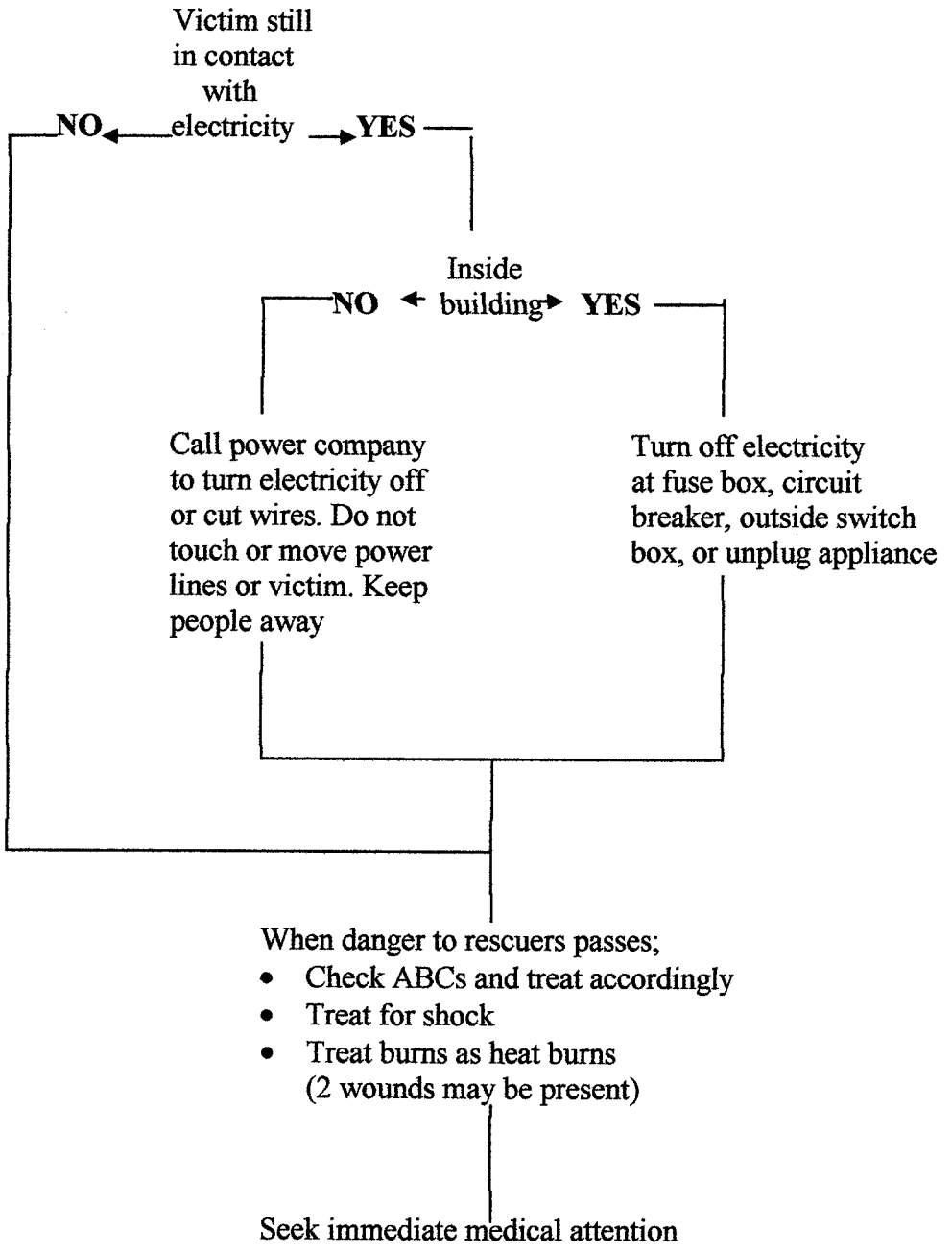
# HEAT BURNS


Degree of burn
(choose more serious
when in doubt)
1
2
3
Apply cold until pain stops. 5-10 minutes
Avoid over-the-counter ointments, butter, petroleum jelly, etc.
Large area
NO
YES
Apply cold until pain stops (5-10 minutes) Cover with dry, sterile dressing
Avoid over-the-counter ointments, butter, petroleum jelly, etc.
Check ABC's and treat accordingly. Treat for shock. Remove clothing and jewelry from burned area. If stuck, cut; don't pull off. Apply sterile dressing or clean cloth. Elevate burned arms / legs.
Seek medical attention
Check burn severity table as a guide about seeking medical attention.

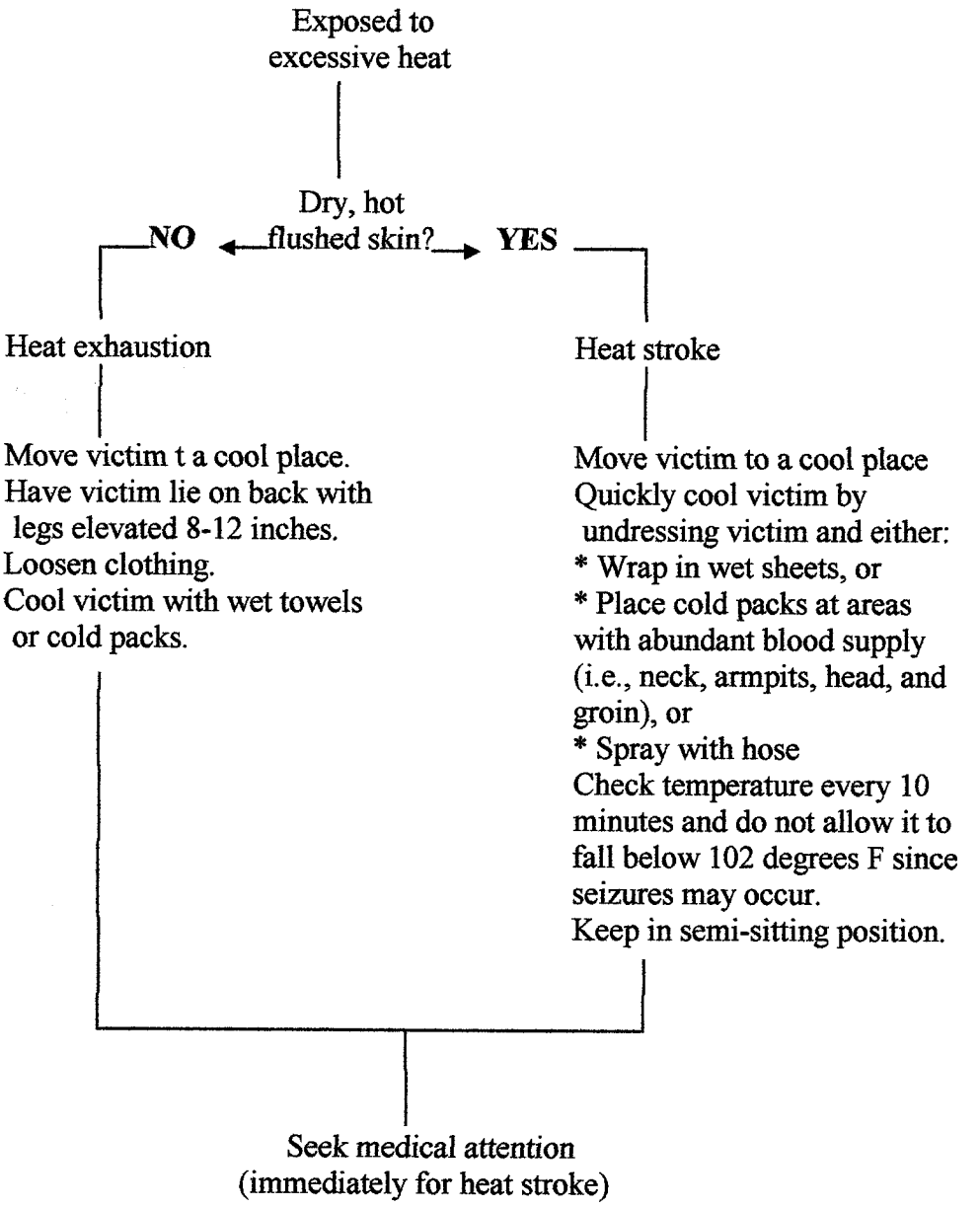
# CHEMICAL BURNS



# ELECTRICAL INJURIES



# HEAT-RELATED EMERGENCIES



# *Level 1 First Aid*

---

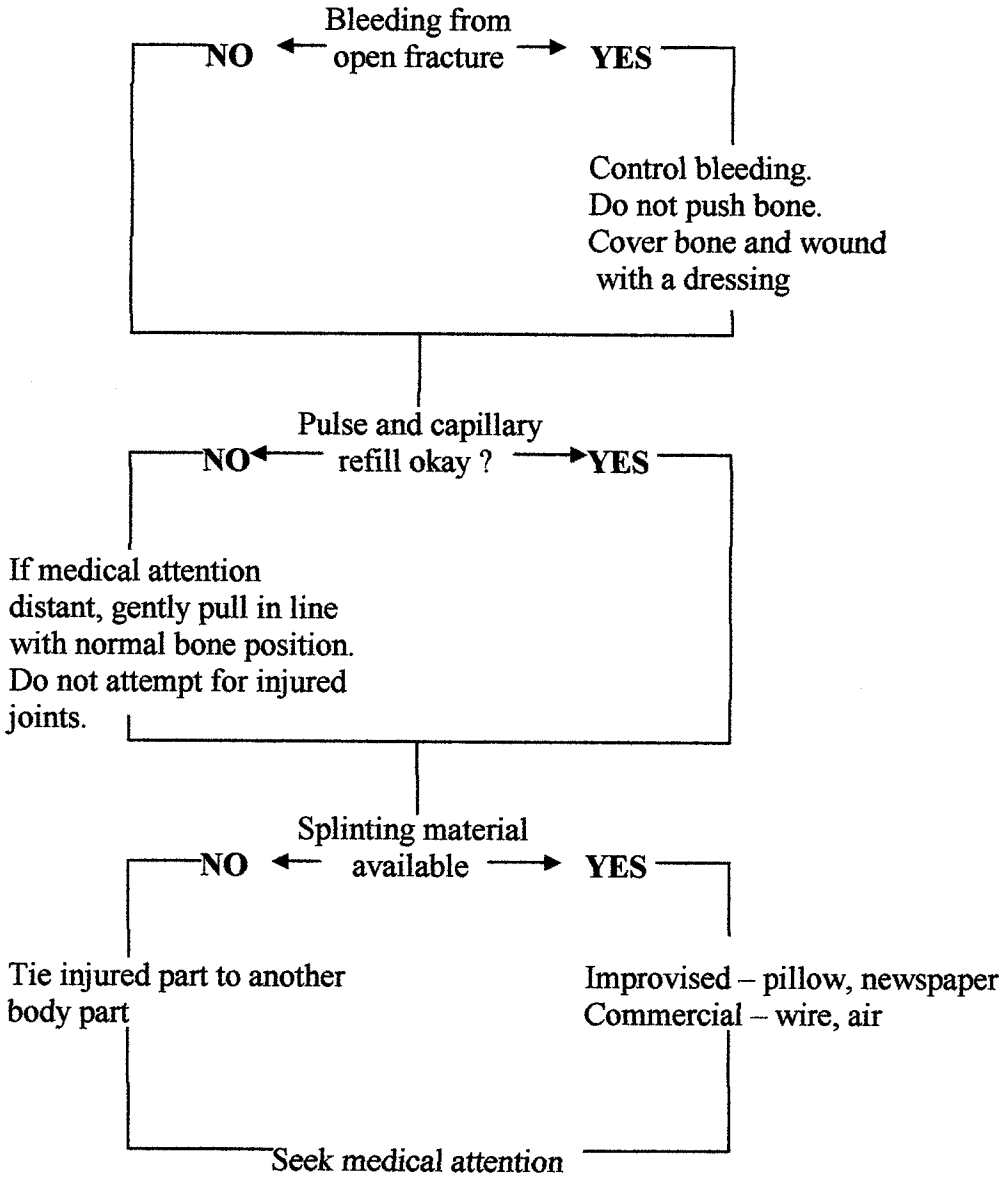
## Fractures

- Open (compound) fracture
- Closed (simple) fracture

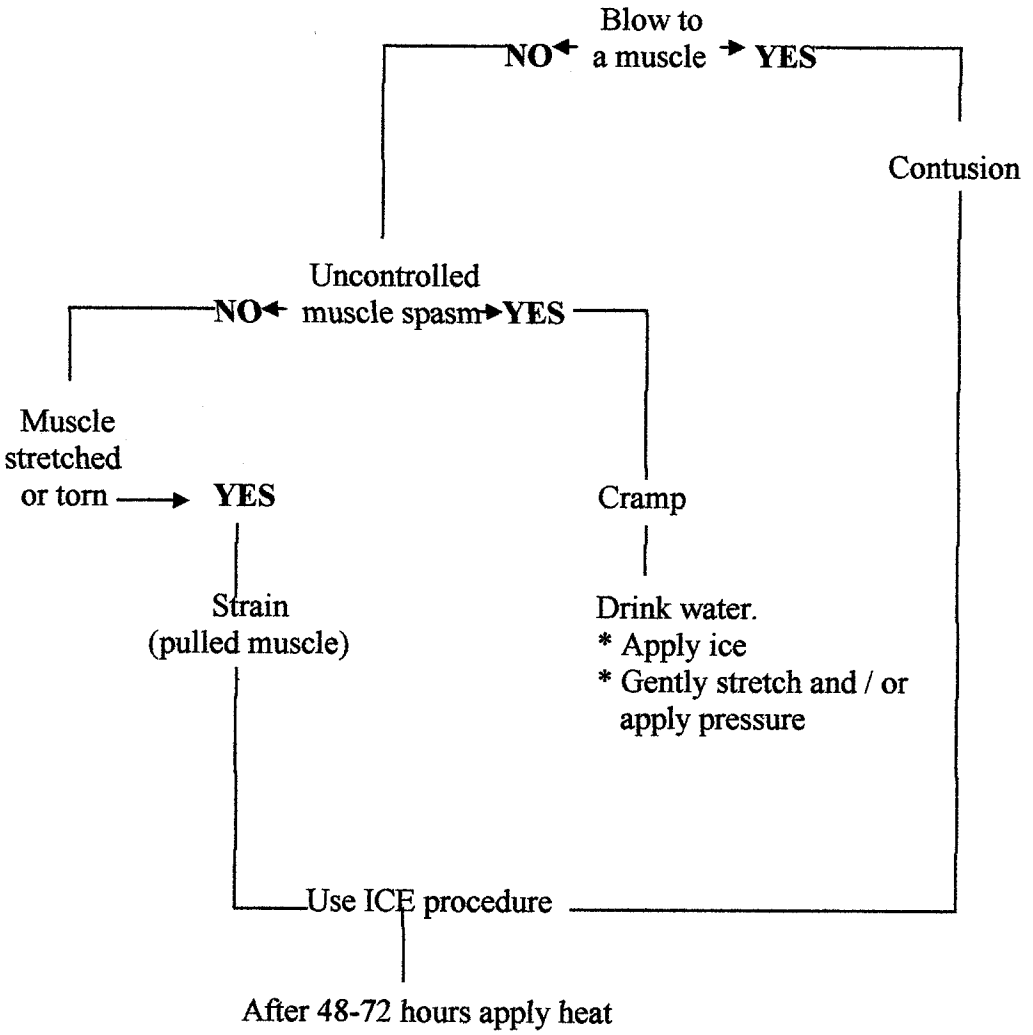
## Signs & Symptoms

- Swelling, caused by bleeding
- Deformity
- Pain and tenderness (reliable sign of Fx)
- Inability to use injured part
- Grating sensation
- History of injury – "I heard or felt a snap!"

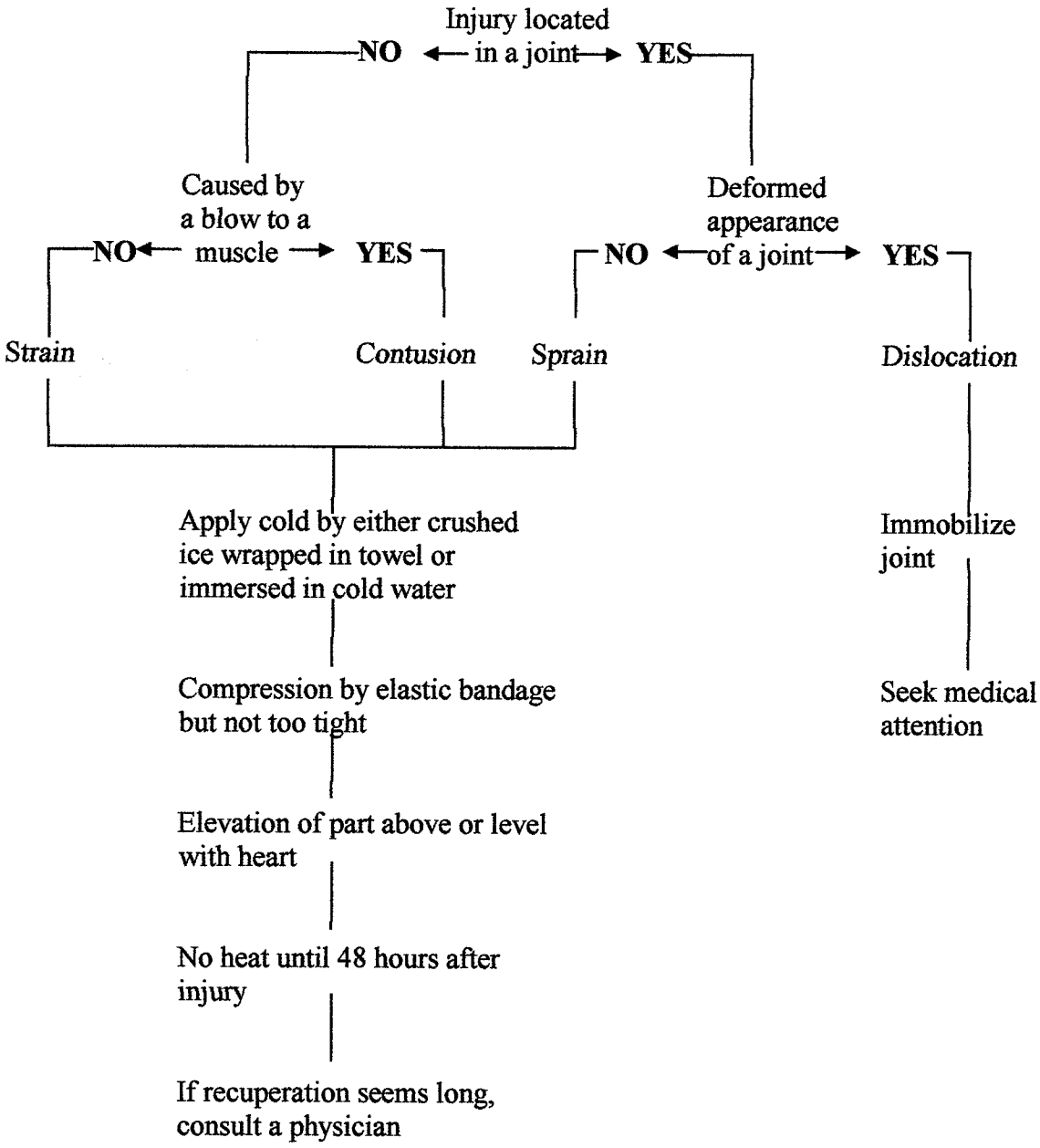
# FRACTURES


Bleeding from
NO
open fracture
YES
Control bleeding.
Do not push bone.
Cover bone and wound
with a dressing
Pulse and capillary
NO
refill okay ?
YES
If medical attention
distant, gently pull in line
with normal bone position.
Do not attempt for injured
joints.
Splinting material
NO
available
YES
Tie injured part to another
body part
Improvised – pillow, newspaper
Commercial – wire, air
Seek medical attention

# MUSCLE INJURIES



# SPRAINS, STRAINS, CONTUSIONS, DISLOCATIONS



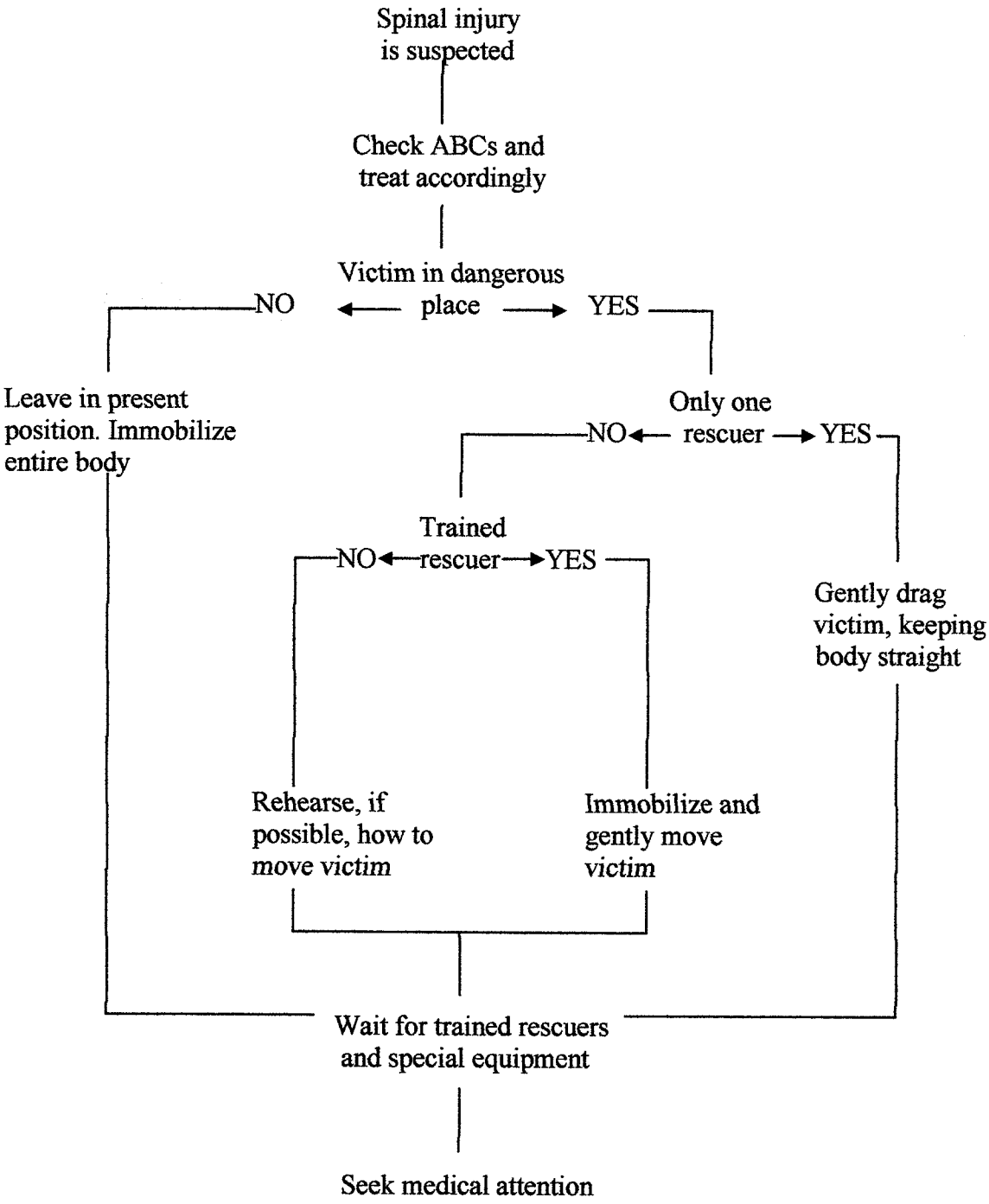
# *Level 1 First Aid*

## Spinal Injuries

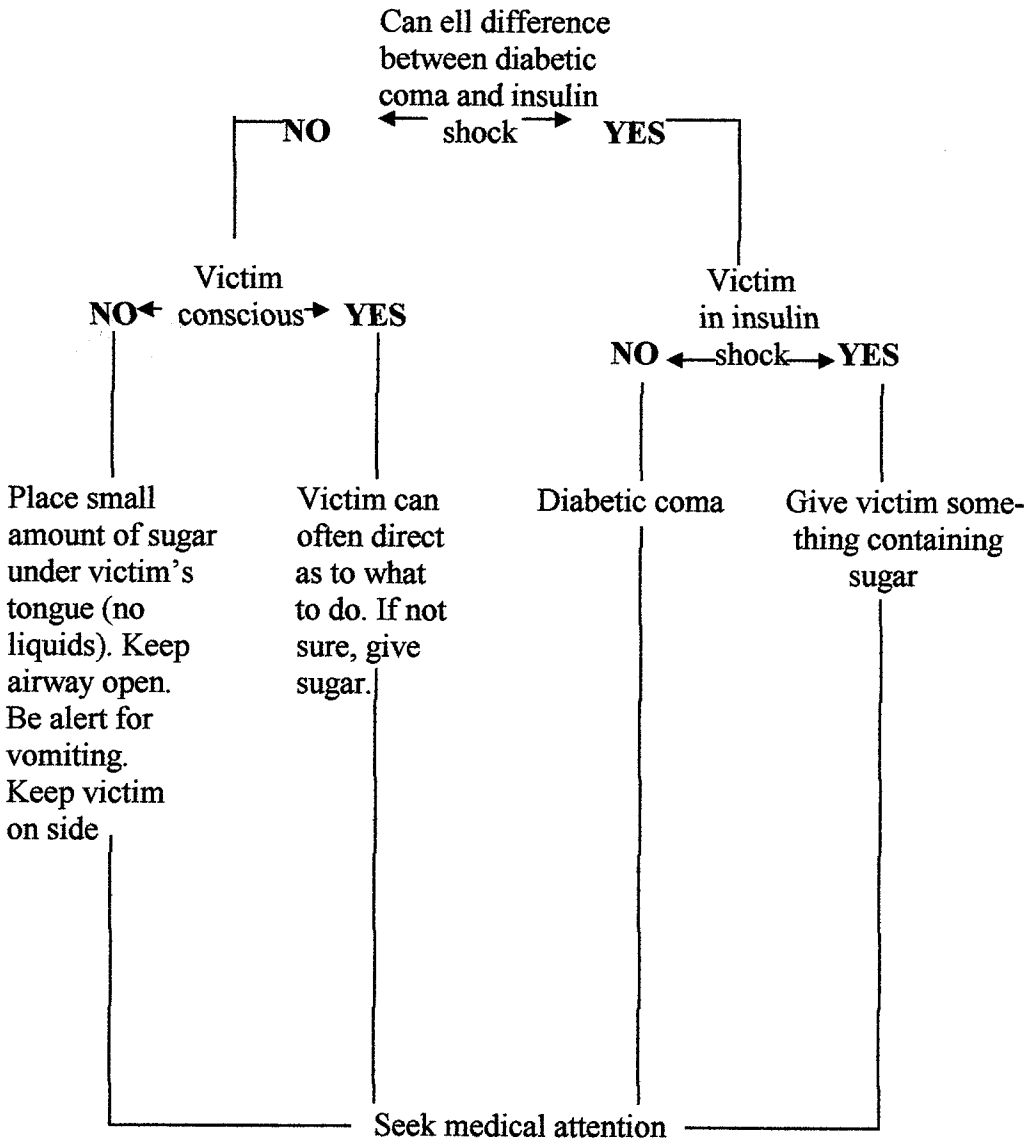
### Signs & Symptoms

- Possible spinal injury in all severe accidents
- Head injuries (20% have spinal injuries)
- Painful movement of arms and/or legs
- Numbness,, tinkling, weakness, or burning sensation in arms or legs
- Loss of bowel or bladder control
- Paralysis to arms and/or legs
- Deformity (odd angle of victim's head/neck)

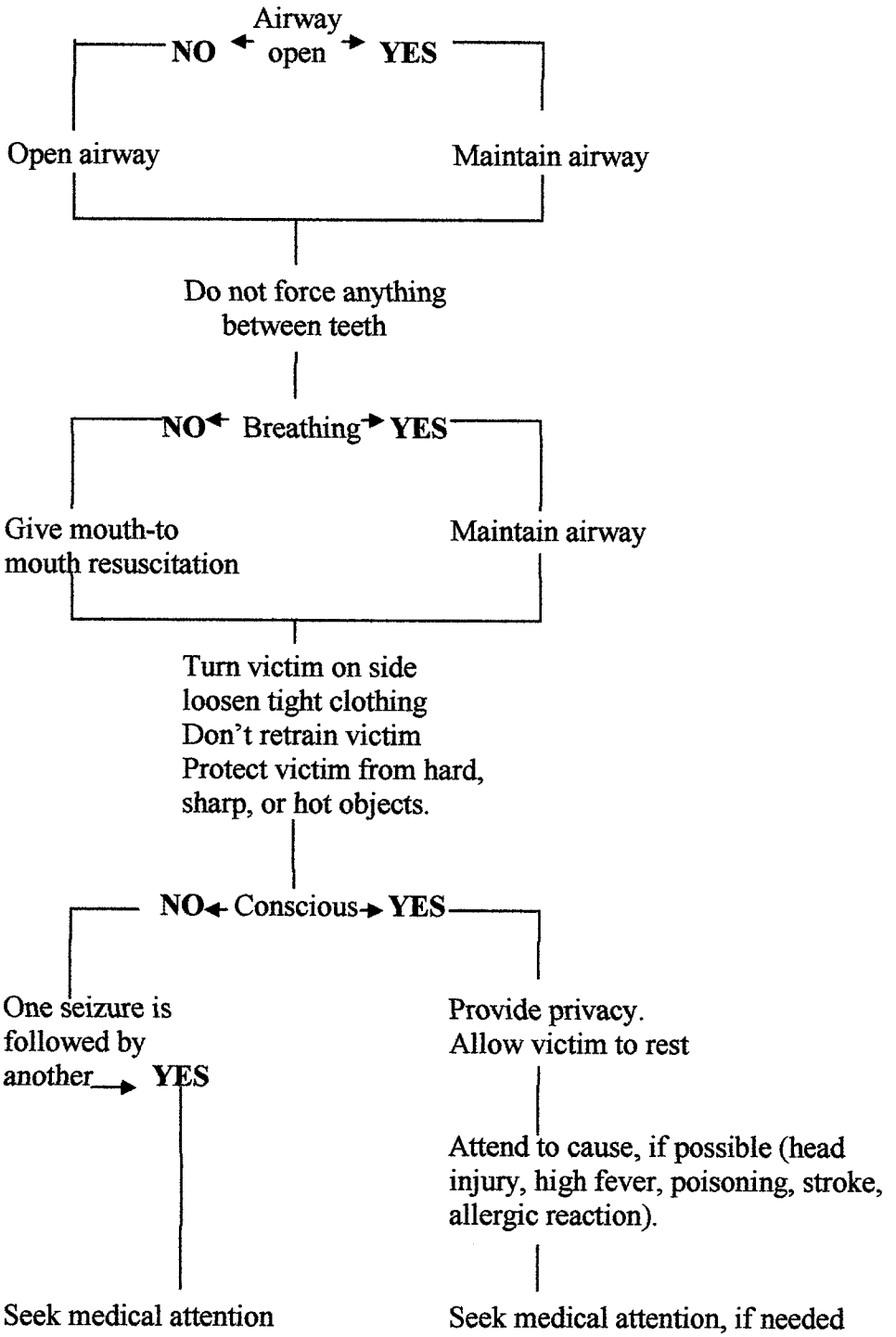
# SPINAL INJURIES



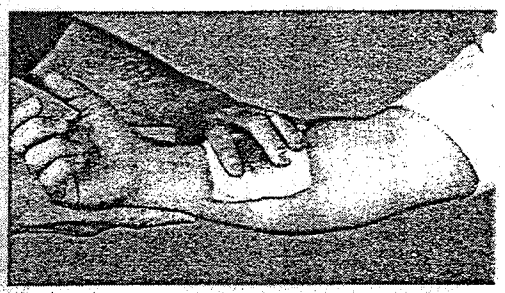
# DIABETIC EMERGANCIES



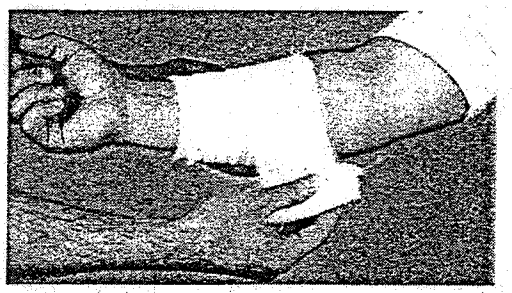
# SEIZURES


Airway
NO
open
YES
Open airway
Maintain airway
Do not force anything between teeth
NO
Breathing
YES
Give mouth-to mouth resuscitation
Maintain airway
Turn victim on side
loosen tight clothing
Don't retrain victim
Protect victim from hard, sharp, or hot objects.
NO
Conscious
YES
One seizure is followed by another
YES
Provide privacy.
Allow victim to rest
Attend to cause, if possible (head injury, high fever, poisoning, stroke, allergic reaction).
Seek medical attention
Seek medical attention, if needed

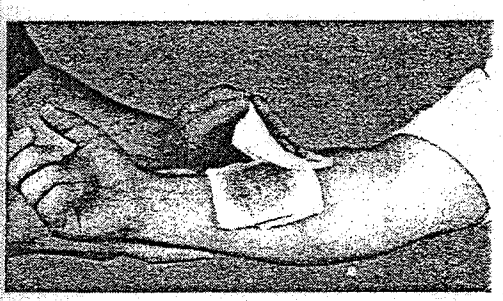
## SKILL SCAN: Bleeding Control



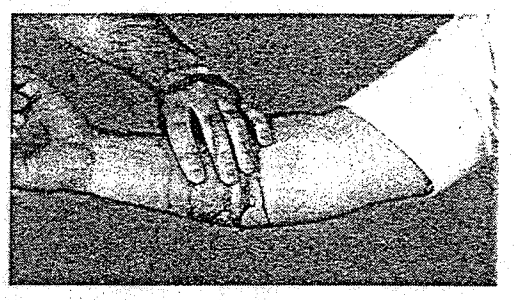
1.



2.



3.



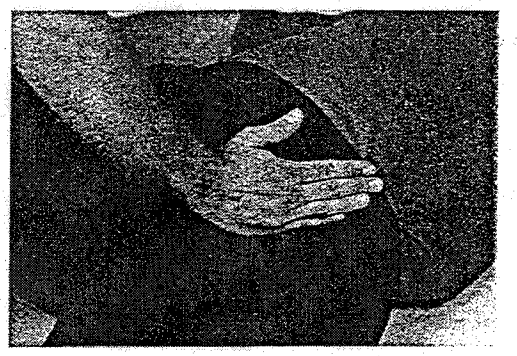
4.

5.

1. Direct Pressure. Use dressing.
2. Pressure bandage.
3. If dressing is blood-soaked, add more on top.
4. For severe bleeding, don't waste time looking for a dressing.
5. Combine direct pressure and elevation.
6. Combine direct pressure with a pressure point at (A) brachial or (B) femoral artery.

Use a tourniquet only as a last resort! Tourniquets are rarely needed.

6A. Brachial



6B. Femoral

## SKILL SCAN: Splinting—Upper Extremities

### CLAVICLE AND ARM SLING

1.

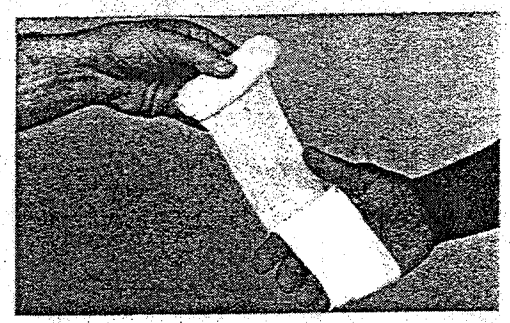
2.

3.

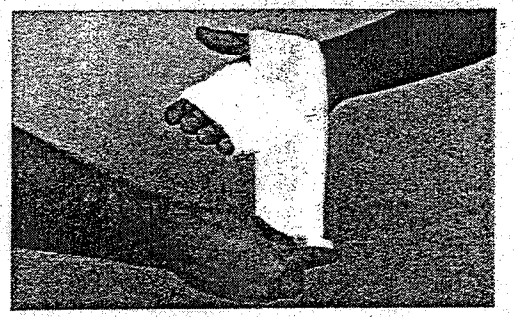
### FOREARM (RADIUS/ULNA)

## SKILL SCAN: Bandaging—Roller, Figure-of-Eight (Self-adhering)

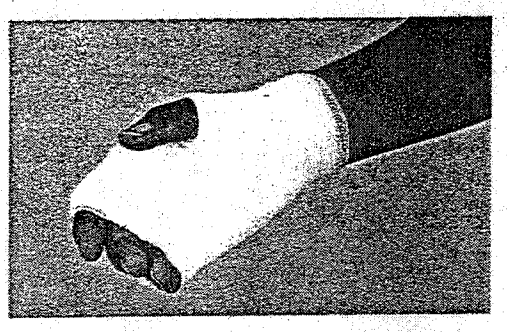
### ROLLER BANDAGE FOR HAND



1.



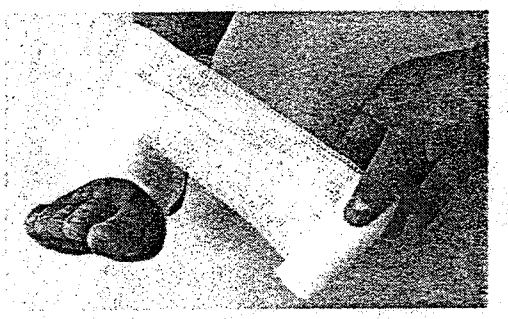
2.



3.

### ROLLER BANDAGE FOR ANKLE

1.

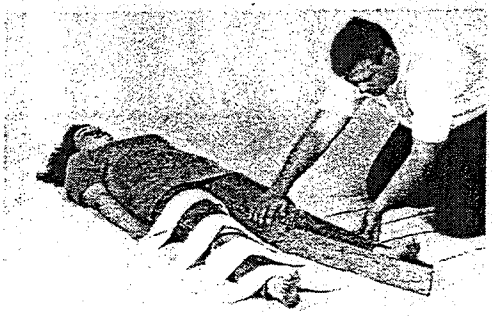


2.

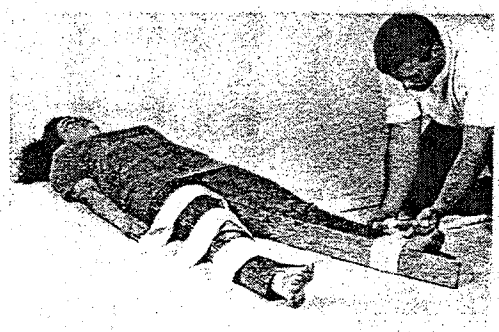
3.

## SKILL SCAN: Splinting—Lower Extremities

### SPLINTING THE LOWER LEG (TIBIA/FIBULA)



1.



2.

3.

### THIGH (FEMUR)

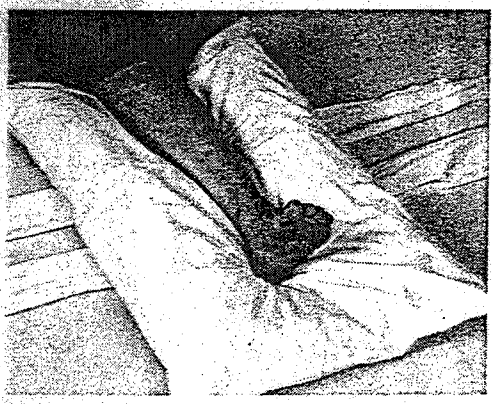
1.

2.

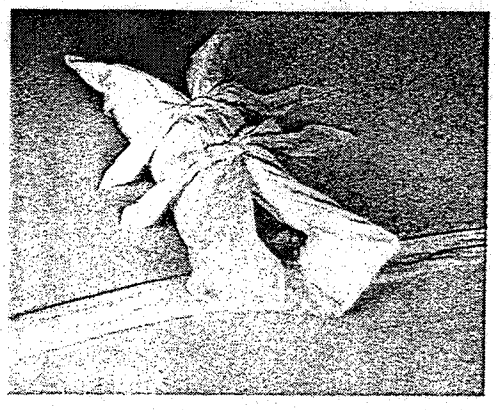
3.

## SKILL SCAN: Splinting—Lower Extremities

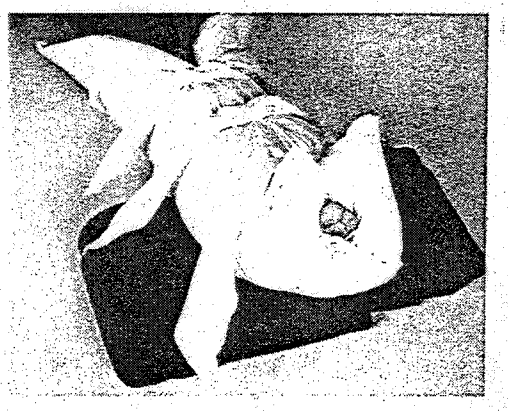
### ANKLE/FOOT



1.

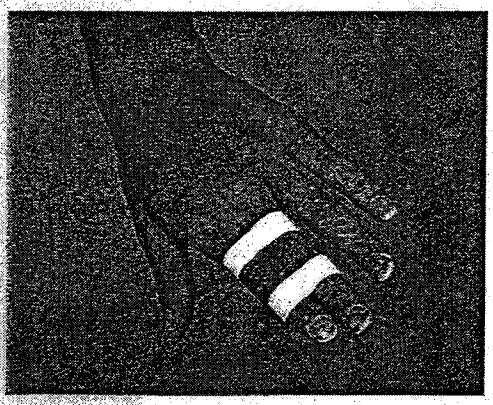


2.

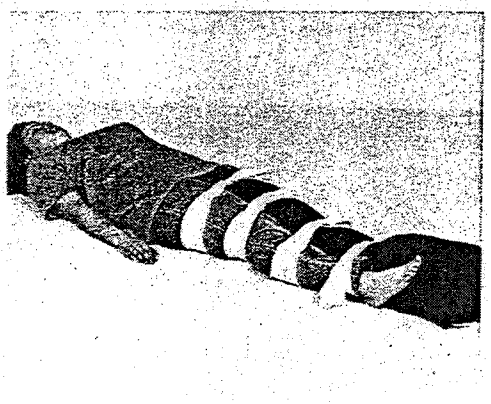


3.

### SPLINTING—SELF-SPLINT



Fingers/toes



Leg