## UNIT INSTRUCTOR INFORMATION

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## UNIT INTRODUCTION

This module will focus on how CERT teams might approach a disaster scene and safely respond. Initial damage assessment and preparing your team to deploy is vital to everyone's safety. Knowing how to complete a size-up is the next step, followed by a plan of action. Members will learn basic search and rescue techniques and what items will be helpful in rescuing and assisting survivors.

## UNIT OBJECTIVES

- Understand the role of CERTs in a search and rescue emergency.
- Know how to complete a damage assessment and set up your team in ICS to deploy and be a resource.
- Know how to properly complete a size-up before acting on a plan.
- Learn and practice basic search and rescue techniques with proper materials.

## UNIT REVIEW

The techniques you learned in disaster medical operations may be used following the techniques you learn tonight. Also remember your ICS structure and how it relates to the information in this unit.

## LOOKING FORWARD

Next week you will learn how to direct traffic and raise your awareness of terrorism. A terrorist attack may be an explosion with an improvised explosive device (IED) or involve chemicals. Your knowledge of light search and rescue, triage, and the transportation systems in NYC will prepare you for emergencies and disasters that may occur.

**Key Points**

- The intent of this unit it to familiarize CERT members with the various types of collapses and the indicators of each type.
- We will also discuss possible CERT roles during a collapse.
- Students will participate in a hands-on exercise. You will practice removing trapped victims and learn the proper carrying methods for removing the victims from a danger area.

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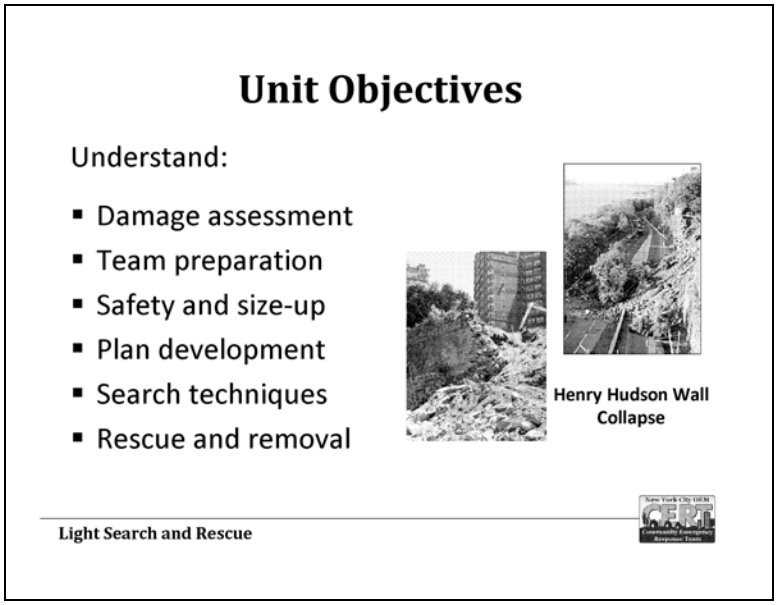


**Key Points**

- By the end of this unit you should able to:
  - Assess the damage of a structure based on the characteristics of the exterior of the building.
  - Understand the importance of team preparation and safety.
  - Develop a plan based on the size up of the situation.
  - Use search techniques to maximize efficiency and limit time within the structure.
  - Practice hands-on rescue and removal techniques.

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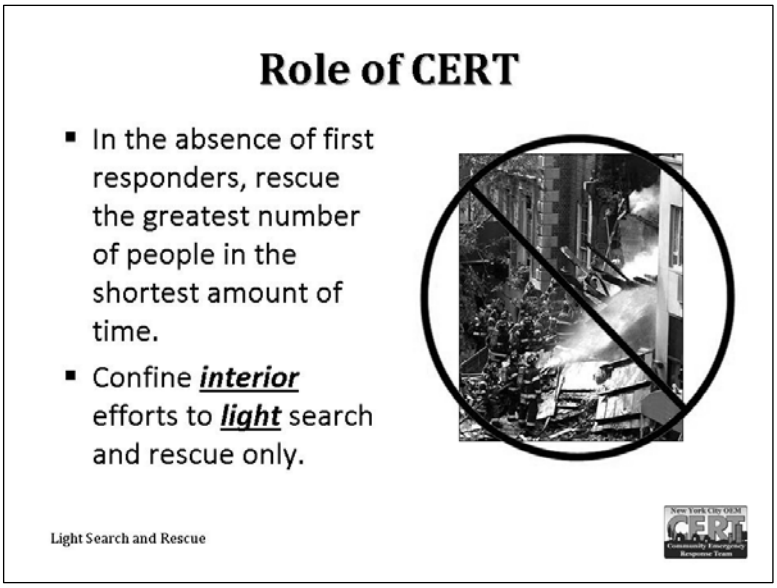


**Key Points**

- The primary role of CERTs at a collapse incident should be to remove able bodied victims from the collapse zone. This should be done without entering the danger zone.
- Interviewing occupants can assist in determining the number of victims within the structure as well as their location prior to collapse.
- CERT members may only enter a structure if the damage caused by the collapse is considered light.
- If the damage is other than light, CERT members should only operate outside the collapse zone.

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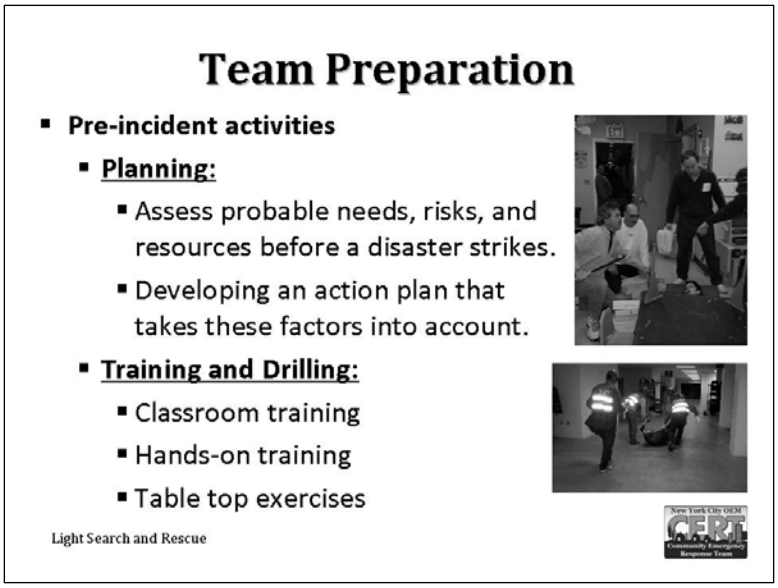


**Key Points**

- One of the most important aspects of any emergency is proper planning.
- Anticipating needs prior to the disaster allows the team to develop strategies to address the most common tasks associated with a collapse.
- Once CERT members understand the technical knowledge associated with collapse assessment and rescue they must participate in hands-on exercises so they can test the practical application of their training.

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**Key Points**

- The safety of the team and individual CERT members is your number one priority.
- No CERT member should operate in an unsafe environment.
- All team members should constantly assess the safety of the situation due to rapidly changing conditions and relay this information to the CERT lead.
- Safety is the responsibility of every member of the team and if an unsafe act is observed, it should be stopped immediately.

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**Key Points**

- CERT safety is *always* your primary consideration at any emergency.
- Responders and others may become disoriented during a collapse because the normal layout of the area is dramatically disrupted.
- Secondary collapse can occur any time after the initial collapse and may occur without warning.
- Once a building experiences a collapse resulting in moderate or heavy damage, the structure is considered compromised and CERT members shall not enter the building or the collapse zone.

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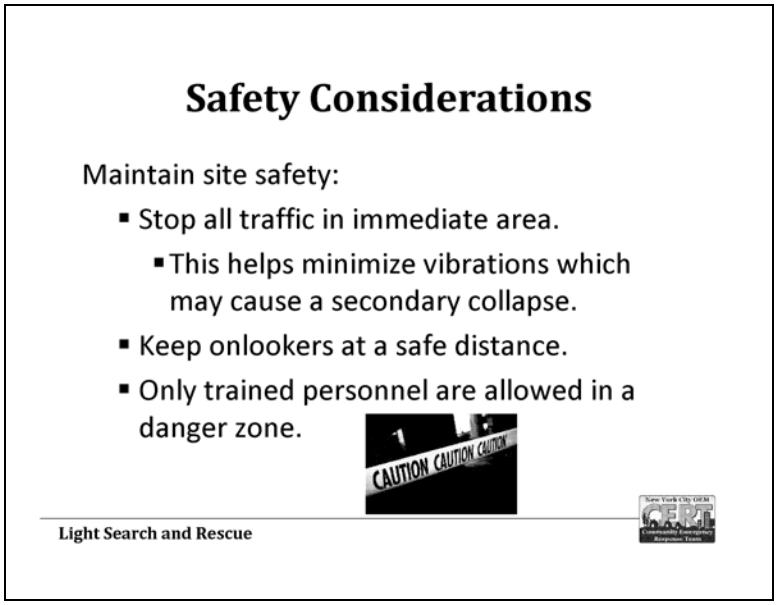


**Key Points**

- Vibrations caused by vehicle or train traffic near the collapse area may cause a secondary collapse.
- NYC CERT members should consider:
  - Notifying the proper authorities, including 911 and OEM Watch Command.
  - Redirecting all traffic near the collapse area while maintaining access for incoming emergency vehicles.
  - Closing the entire block to vehicular and pedestrian traffic.

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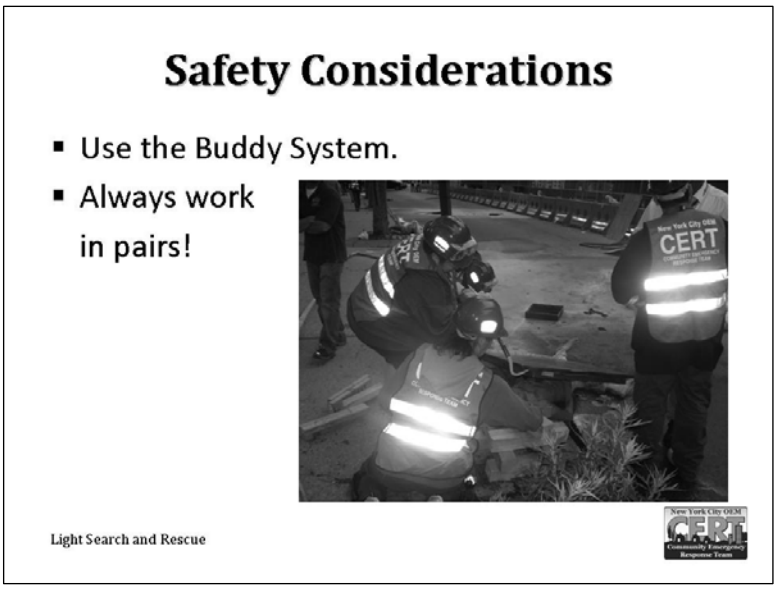


**Key Points**

- NYC CERT members should always work using the buddy system.
- All first responders are required to operate using a two in and two out response that requires the following:
    - When entering a dangerous area you must work in close proximity to another member.
    - If one member must leave the area then both members must leave together.
    - Safety team members must be available outside the danger area in case members require assistance.
- NYC CERT members should consider using pairs of runners to deliver critical information back to the CERT operations section or the CERT lead.

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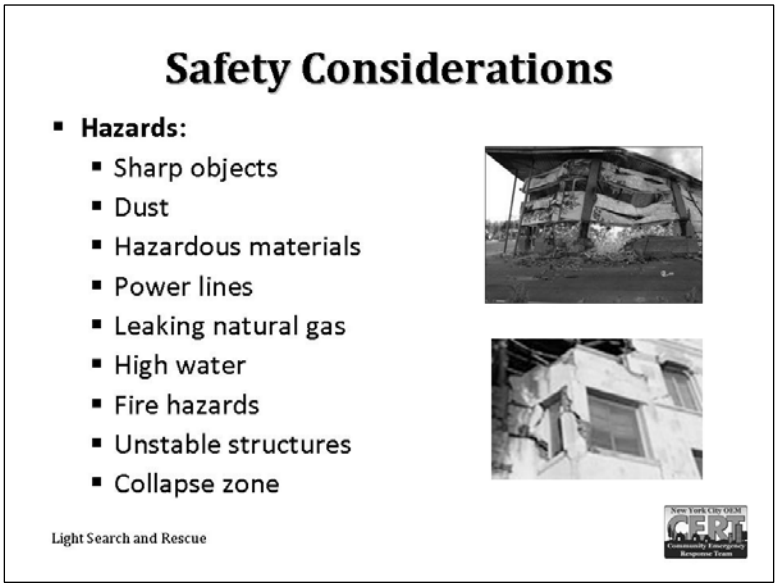


**Key Points**

- There are numerous hazards associated with any collapse.
- It is impossible to list all of the hazards; the list above includes those that are most commonly found.
- Proper size-up and protective equipment can limit the potential dangers of the hazards.
- Unless we can identify all the hazards associated with the collapse it is impossible to determine if it is safe for us to operate so we must perform a thorough size-up before determining our course of action.

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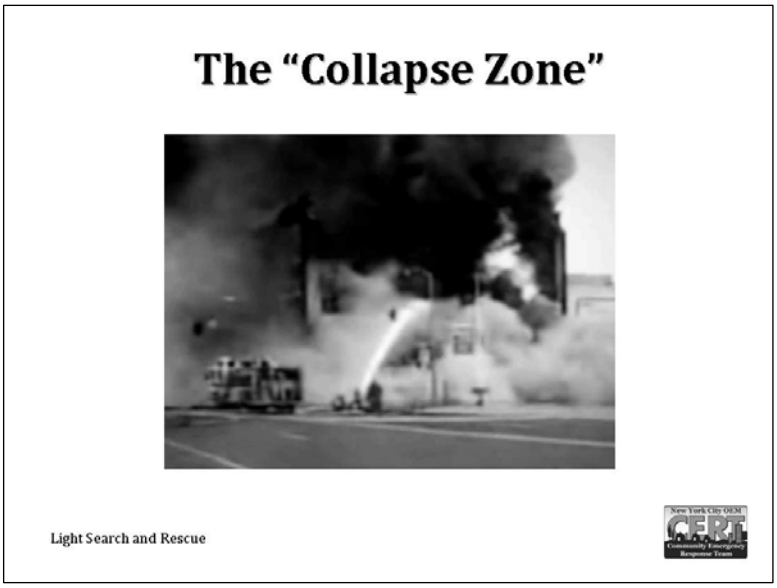


**Key Points**

- The collapse zone is considered the distance equal to the total height of the structure.
- Debris from the collapse can bounce much further than that distance.
- Some collapse manuals have listed the collapse zone as one and a half times the total height of the structure to allow for bouncing debris.
- When making decisions about your safety, NYC CERT members should use the zone of one and a half times the height of the structure.

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**Key Points**

- Due to the strenuous tasks associated with operating at a collapse, CERT members may become fatigued quickly.
- As individuals become tired, they will be more inclined to bypass safety measures and make unsafe decisions contrary to their training.
- Since fatigue is one of the most common and dangerous hazards at any emergency, the CERT lead should rotate personnel prior to members becoming fatigued.
- Recorders should assist in documenting the work times of team members and notify the CERT lead of these times at regularly.

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## CERT Exercise

- Assemble into groups.
  - Each group must explain the role of the following positions at a light search and rescue incident:
    - CERT Lead, Operations, Logistics, Recorder and Staging Area Manager
  - How will your resources be used at a light search and rescue operation?
- Use a recorder to document your answers.
- Select a spokesperson to report out.

Light Search and Rescue

**Key Points**

- Prior to any team deployment, ICS roles must be established and members be placed in groups maintaining a manageable span of control (1:5).
- Understanding the roles of each position and being disciplined to remain in only that role is a critical component of a successful operation.
- The CERT lead must consider the number of resources required to free any one victim and determine if the strategy will provide the greatest good for the largest number of people.
- Recorders document the team structure and resources available to assist the CERT lead in determining what strategy may be used during a collapse.

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**Key Points**

- The above list contains the minimal amount of safety equipment required by any NYC CERT member that is deployed.
- No member will be allowed to leave the assembly area without proper protective equipment and official NYC CERT ID.
- The CERT lead is responsible to ensure that each member meets the above requirements. This may be delegated to group leaders.

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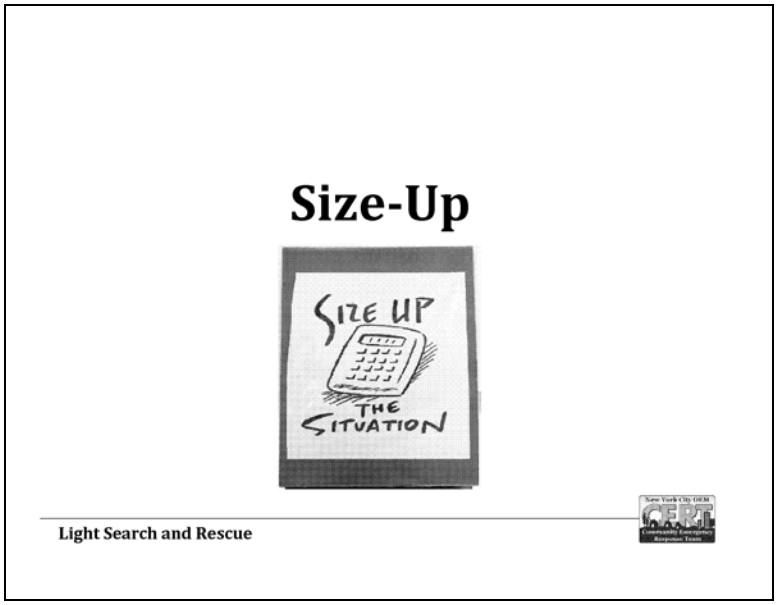


**Key Points**

- Size-up involves assessing the situation and determining a safe plan of action.
- Size-up starts at the beginning of any operation and will be on-going for the duration of the operation. It is the part of the process and not a single event.
- Size-up should be done by all NYC CERT members and is not solely the responsibility of any one member.

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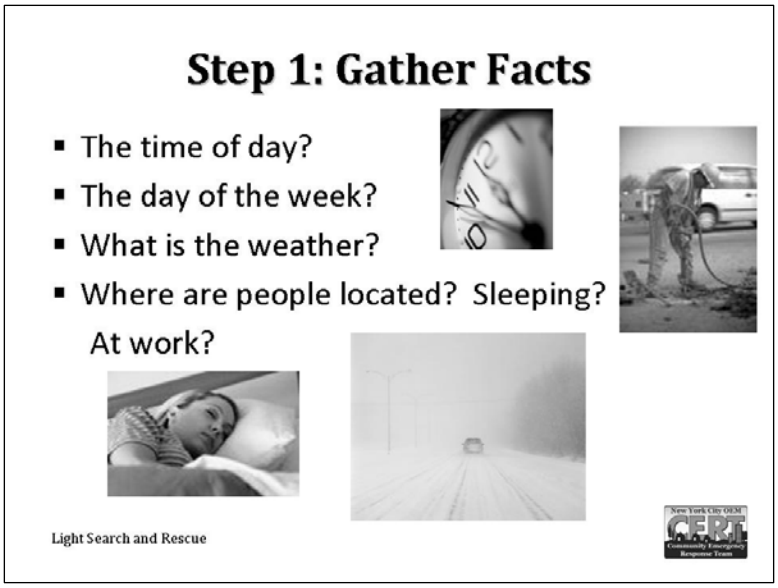


**Key Points**

- Size-up begins by gathering the facts.
  - What happened or is happening?
- The facts of the situation will guide search and rescue efforts.
- The time of the event and the day of the week are very important in the assessment:
  - Where are victims likely to be? What rooms are they likely to be in during different times of the day?
  - In the evenings, the greatest need for search and rescue will be in residential buildings. During daytime a priority may be searching commercial office space.
  - Will daylight be a factor in the assessment of the ability to conduct a search? How much daylight is available? Do we have alternative lighting?
  - How will the weather affect the assessment or size-up and therefore rescue efforts? How will it affect victims? You may have to factor in:
    - Wind
    - Rain
    - Temperature and
    - Rising waters.

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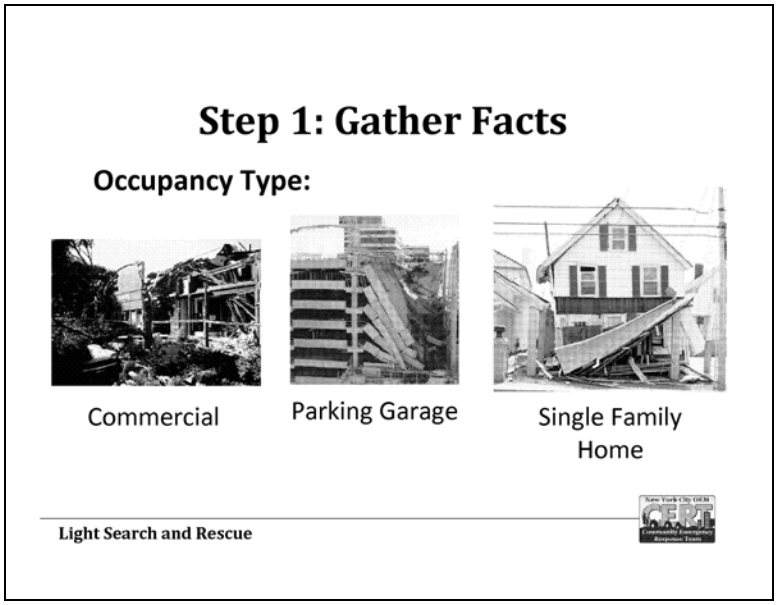


**Key Points**

- The purpose for which the occupancy was designed may indicate the likely number of victims and their location (e.g. single family home, multi-family dwelling).
- Some types of construction are more susceptible to collapse than others.
- The age of the structure should be a consideration in assessment. New York City's infrastructure is aging and may be susceptible to compromise or collapse.
- NYC CERT members should be aware of the hazards relating to secondary collapse.

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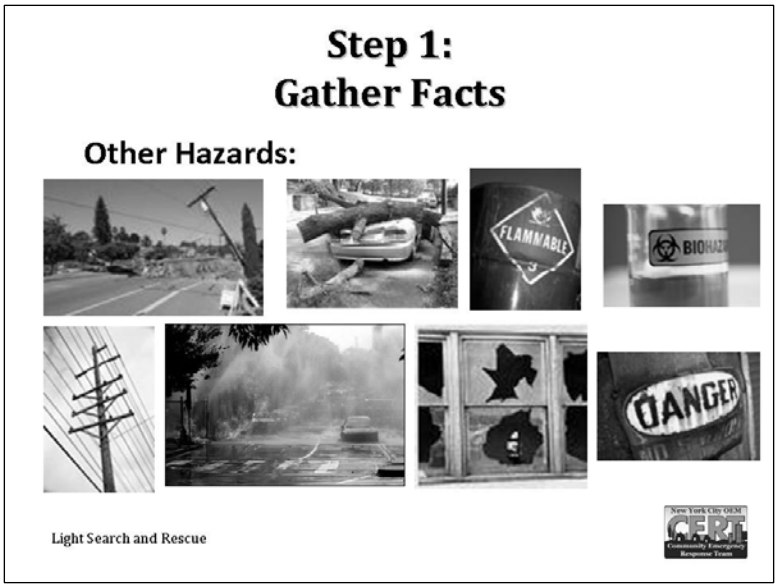


**Key Points**

- Knowledge of other potential hazards in the general and immediate areas is important in size-up and will most definitely affect search and rescue efforts.
- NYC CERT members should consider the following before initiating any search and rescue actions:
    - What and where are the general hazards in the area?
        - Utilities such as gas and electric;
        - Natural hazards; and
        - Hazardous materials in the area.
- During the CERT size-up of any search and rescue effort it must be emphasized that the acceptable level of risk analysis on the part of any CERT member is “zero” or none.
- NYC CERT members should focus on those activities which may aid victims and first responders while not endangering themselves or any other member of the team.

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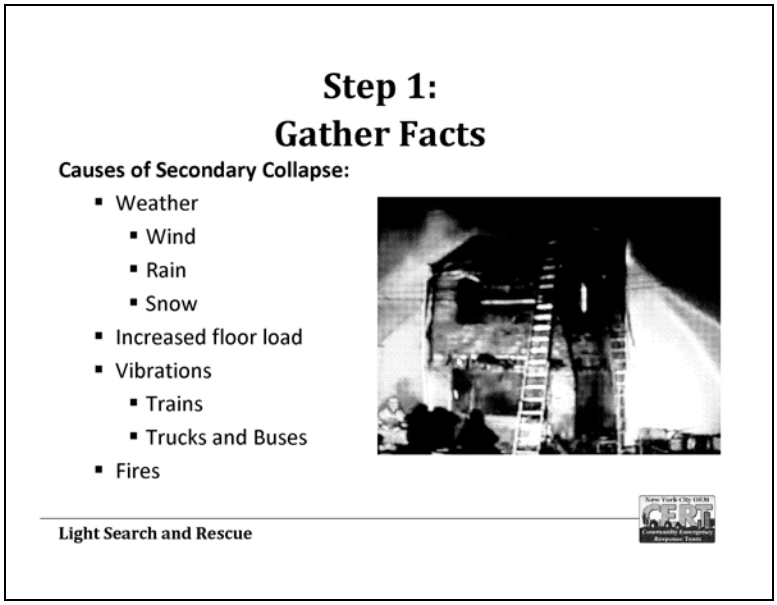


**Key Points**

- An important part of size-up is the risk of secondary collapse.
- While assessing any structure for damage, the safest approach is from the flanks so that you are walking toward the corners of the building and not directly in front of the walls which would be considered the collapse zone.
- Some causes of secondary collapse include:
  - Weather – rain or snow
  - Fire – the burning away of structural members compromising structural integrity
  - Increased load within the building
  - Vibrations – anything from an earthquake to the subway, trucks, or buses passing

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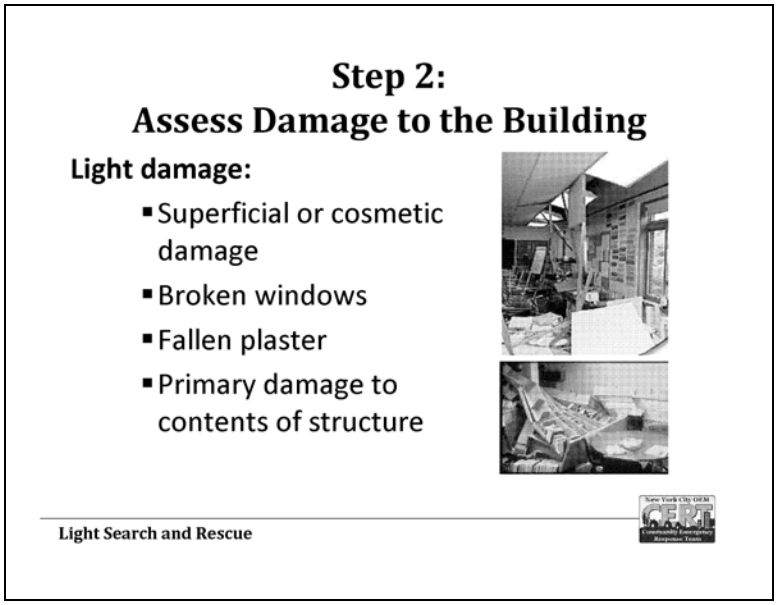


**Key Points**

- A lightly damaged building will have superficial or cosmetic damage only.
- Damage may include broken windows or falling plaster.
- Debris may include dropped ceilings, plaster, or wood.
- Contents may include shelving, bookcases, and fallen stock.
- NYC CERT members may be asked to operate in a lightly damaged building to perform search and rescue.
- The objective of the CERT team will be to locate, stabilize, and immediately evacuate victims to a safe area while minimizing the number of rescuers inside of the structure.

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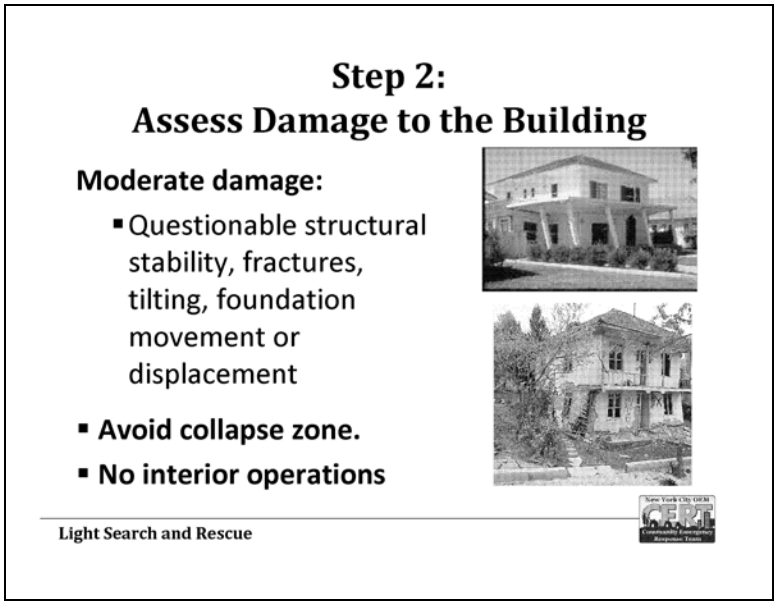


**Key Points**

- NYC CERT members shall not conduct any operations inside of a moderately damaged building.
- A moderately damaged building is one of questionable stability. Features may include fractures or cracks in the exterior walls, tilting or leaning, as well as possible foundation movement or displacement.
- NYC CERT members should be aware and avoid the collapse zone around the building. All CERT operations should be conducted from a safe area outside of the collapse zone.
- NYC CERT members should consider the following actions:
  - Tape off the collapse zone and warn others of the danger.
  - Conduct a perimeter survey for victims.
  - Interview bystanders.
  - Call out to possible victims inside of the structure.
  - Relay this information to first responders.

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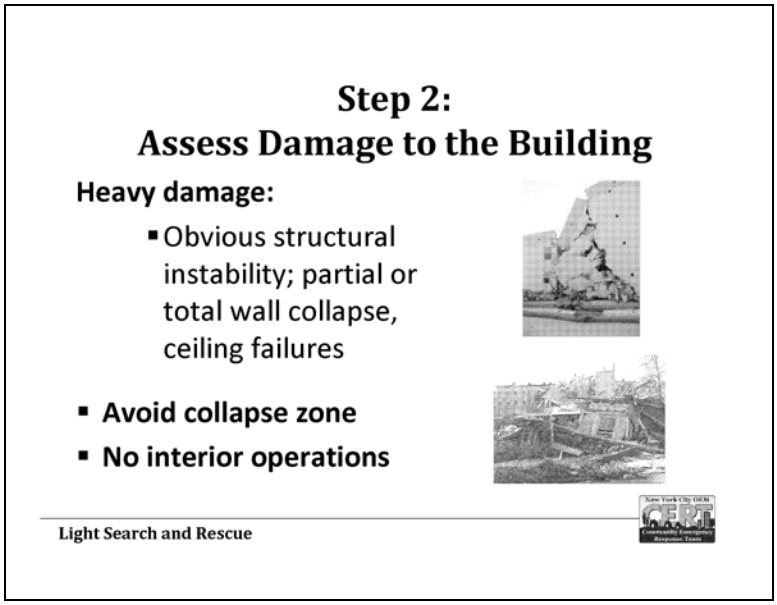


**Key Points**

- NYC CERT members shall not conduct any operations inside of a heavily damaged building.
- A heavily damaged building will have obvious structural instability. There may be a total collapse of the structure or a partial collapse of walls, ceilings, or floors. The building may be filled with fire, smoke, or hazardous materials inside.
- NYC CERT members should secure the building perimeter as mentioned earlier and warn others of the danger that exists.

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**Key Points**

- The size-up of any search and rescue operation for a NYC CERT member should include an identification and evaluation of available resources.
- NYC CERT resources include people, tools, and time:
  - People can serve as both trained rescuers and support personnel.
  - Tools will depend on availability and the needs of the situation.
  - Time may be limited for some victims.
- The first 24 hours after a disaster has been referred to as the "Golden Day" or the period during which injured or trapped victims have an 80 percent chance of survival.

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# Summary

| If Structural Damage Is . . . | Then The CERT Mission Is . . . |
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| **Light:** | To locate, triage, and prioritize removal of victims to designated treatment areas by the medical operation teams. |
| **Moderate:** | To locate, stabilize, and immediately evacuate victims to a safe area while minimizing the number of rescuers inside the building. |
| **Heavy:** | To secure the building perimeter and warn others about the danger of entering the building. |

Light Search and Rescue

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**Key Points**

- The development of an on-site search and rescue plan is a prerequisite to any light search and rescue response.
- Safety of yourself and your team members remains your number one priority.

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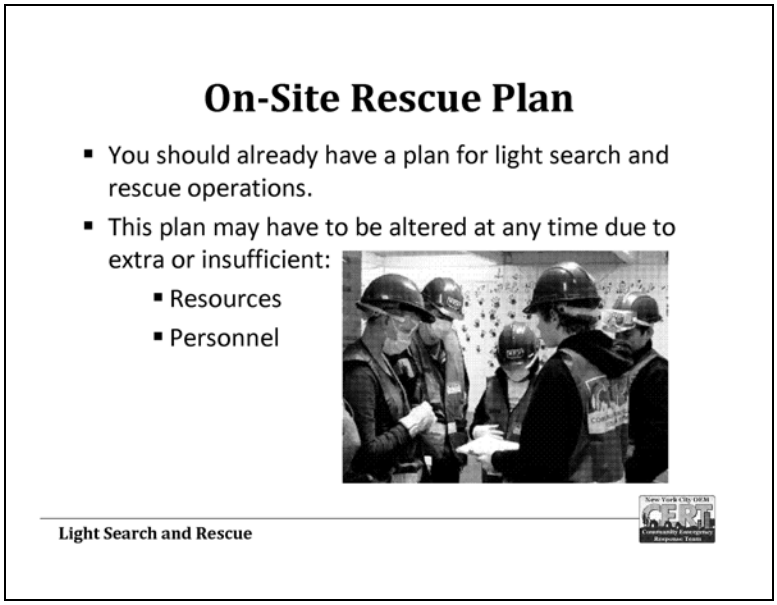


**Key Points**

- NYC CERT members should prepare their team for operations relating to light search and rescue.
- These activities may include:
  - Designating possible light search and rescue group leaders.
  - Gathering tools or equipment.
  - Developing possible methods of transporting equipment to the scene.
  - Practicing cribbing and lifting methods within the scope of CERT training.
- Any plan should be flexible to meet the needs of a changing situation.

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**Key Points**

- NYC CERT members can employ search techniques to assist victims that may be trapped under light debris or unable to extricate themselves due to injury.
- Keep in mind that all NYC CERT members must maintain situational awareness at these incidents due to dynamic and quickly changing conditions.

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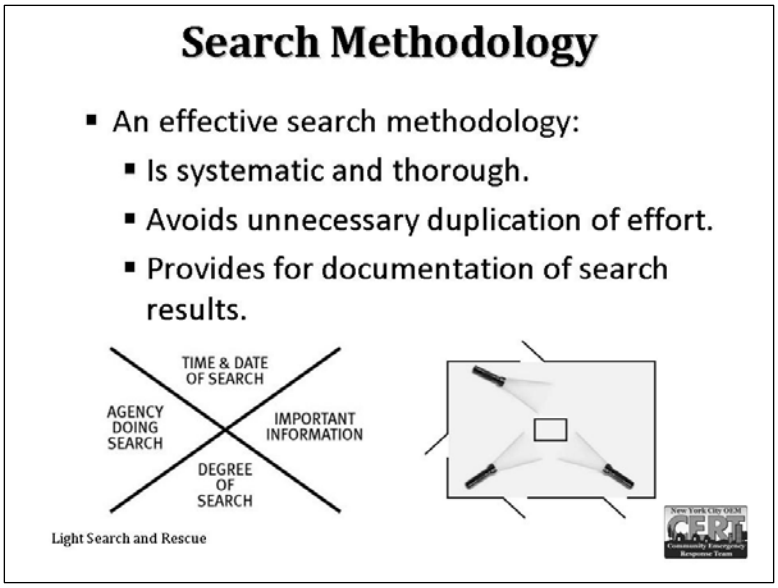


**Key Points**

- NYC CERT must establish a plan before entering a location to search for victims.
- Members do not want to duplicate the efforts of others; this is inefficient and exposes searchers to unnecessary danger.
- Make sure the search team records the results of its searches in all areas. This information will be provided to emergency responders during the transfer of command.

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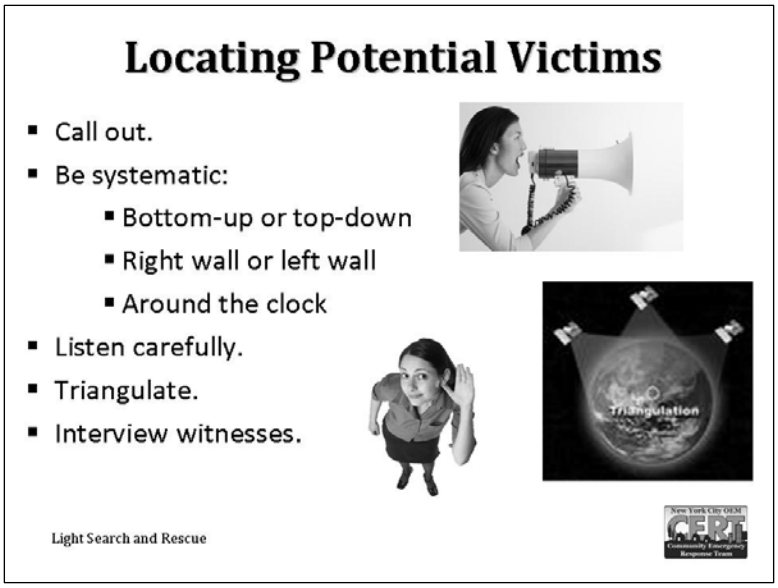


**Key Points**

- Call out to victims as they could be concealed by debris but may be able to respond to your call.
- Decide on what search pattern to use as a team and record the results of the search effort.
- Be sure to position members at different locations throughout the search area and listen carefully for responses or tapping sounds.
- Talk to surviving occupants to see if they can provide information on the last known location of possible victims.

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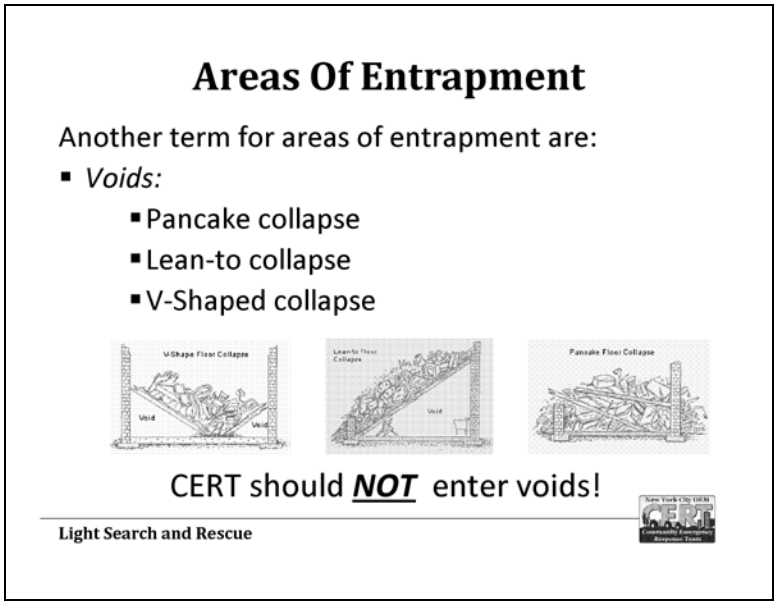


**Key Points**

- Voids are areas that have not been filled in or crushed by the falling debris. They are an area of refuge for an individual who has survived the initial collapse.
- There are a number of different types of voids. They all have one thing in common; they are very dangerous and unstable.
- NYC CERT members should not enter voids because they are considered a life-threatening environment. If you hear someone responding from a void, record the location and get as much information from the victim as possible and give this information to the emergency responders.

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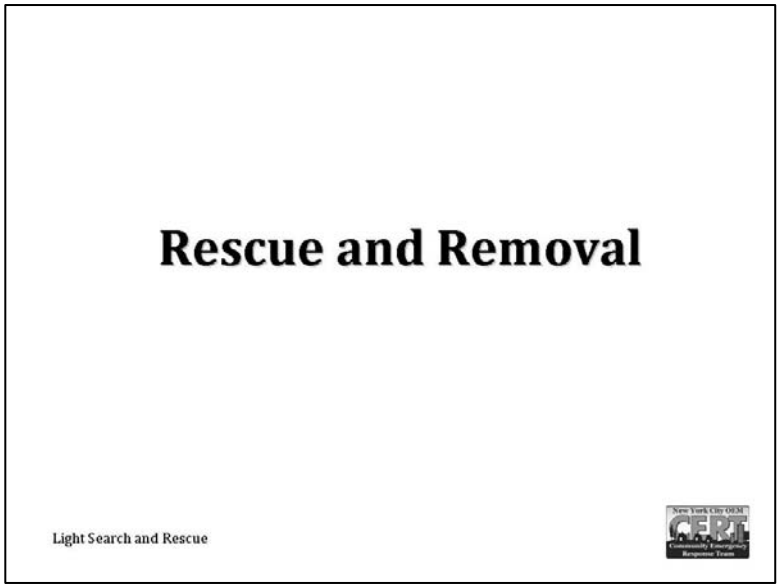


**Key Points**

- NYC CERT members can practice how to safely remove a victim after finding them during the search phase.
- Proper technique will keep you safe and keep you from injuring yourself while helping others.

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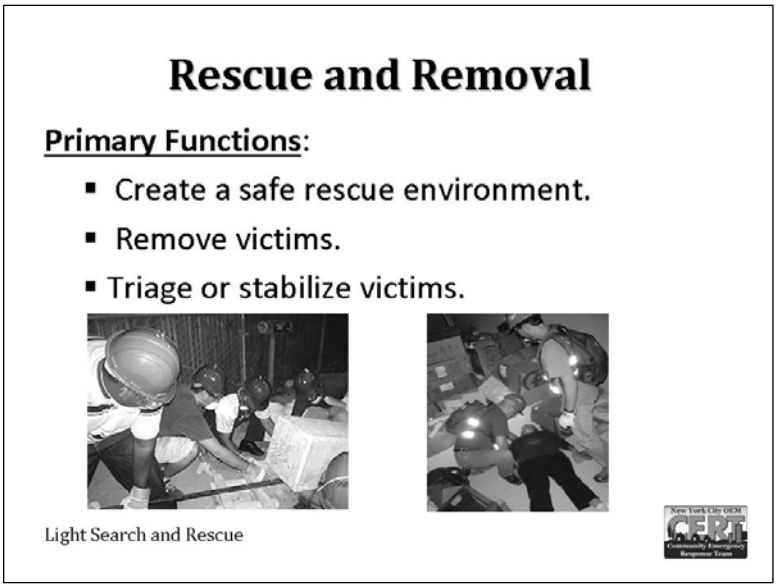


**Key Points**

- A NYC CERT member must perform an incident safety size-up to determine if it is safe for CERT to operate.
- If the scene is determined to be safe for a NYC CERT, the team must operate in a safe manner. Treating and removing the victim can cause more harm to NYC CERT members and those you are helping if not done properly.

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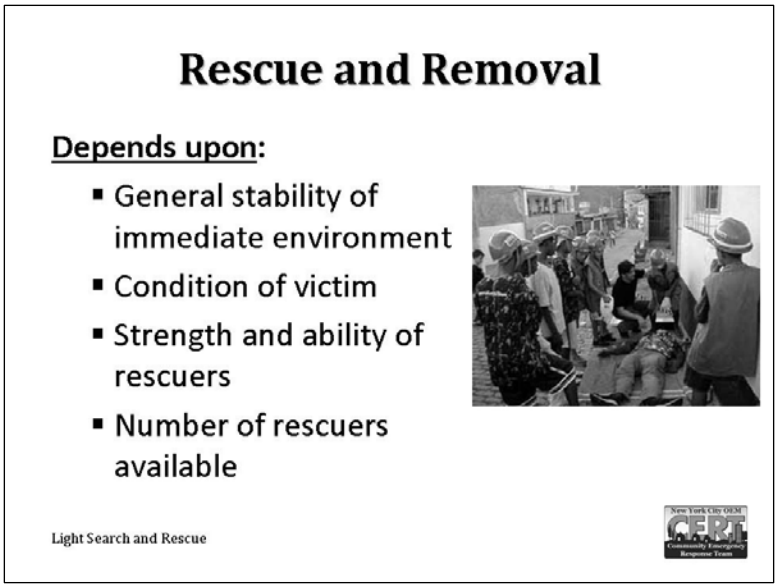


**Key Points**

- The actual rescue and removal of a viable victim is dependent on many factors that must be evaluated at the scene of the incident.
- The difficulty of the rescue and removal must also be considered. If the rescuers do not have the proper tools to safely rescue the victim, they are now operating in a manner that is putting the victim and the rescuers in danger. This would be a time to stabilize the victim and alert emergency responders to the situation as soon as they arrive.
- Keep in mind that removing a victim that is unable to walk or climb requires large amounts of manpower. Carrying a victim over unstable terrain is an exhausting operation that may require relief before they are removed to a safe environment.

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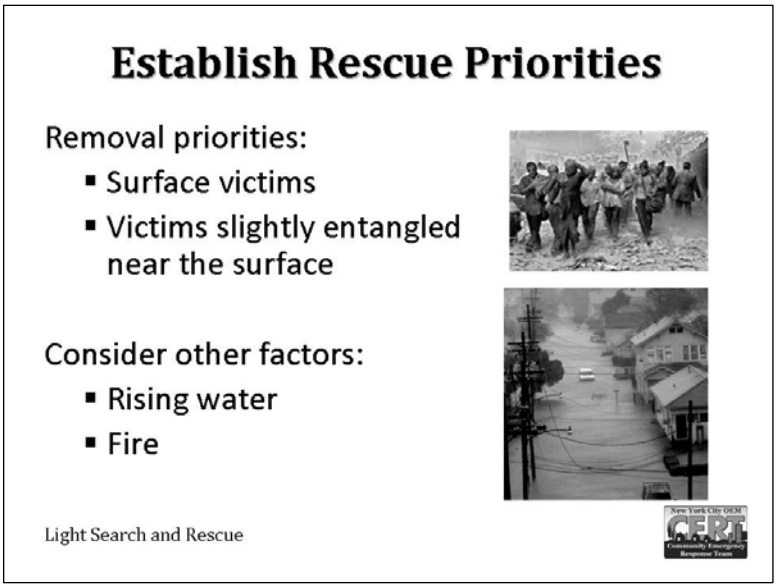


**Key Points**

- Surface victims that are uninjured will self-evacuate. Those on the surface that have injuries may need assistance to get to safety. Remove these victims first.
- If there are large numbers of surface victims with injuries, additional CERT members can transport them to the casualty collection point (CCP), while members of the search group continue to remove the additional victims from danger.
- People that are partially entangled will require more time to remove from danger. NYC CERT members should attempt to do the greatest good for the largest number of people by accomplishing the easier rescues first before taking on the more time-consuming operations.
- NYC CERT members must maintain situational awareness to recognize other hazards in addition to the original incident. SEE THE BIG PICTURE.

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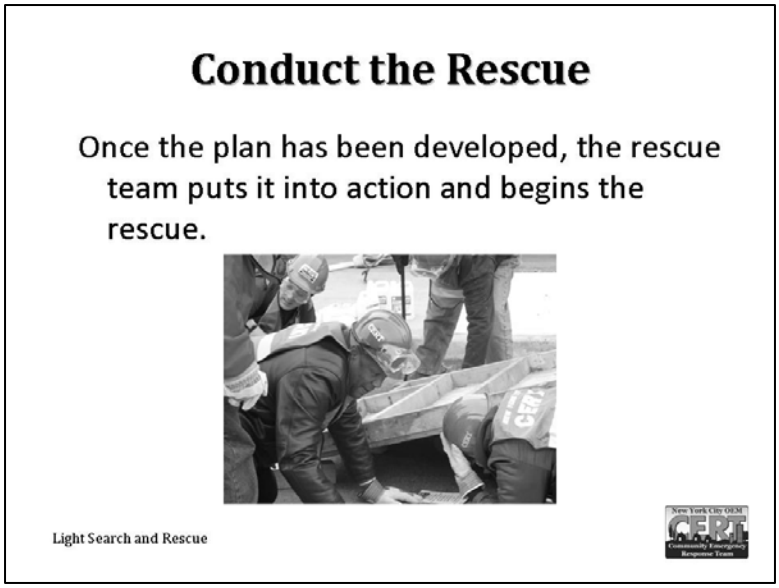


**Key Points**

- Everything leading up to this point was preparing for the rescue and removal of the victim.
- Once the plan is in place it needs to be implemented.
- Each step of the way must be evaluated for personal and team safety. If one method is unsafe, reevaluate and attempt another method.

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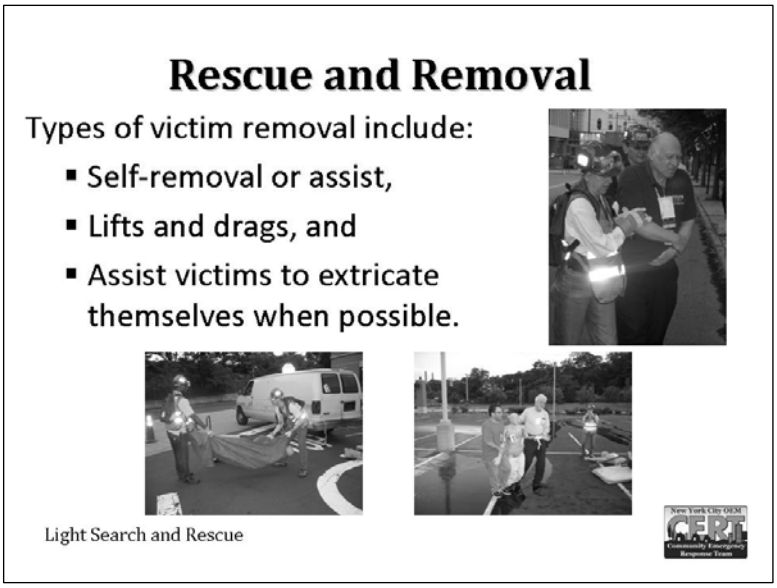


**Key Points**

- There are a wide variety of rescue and removal methods that can be employed. It is most important to use the method that will ensure the most effective and safe operation for the victim and the rescuers.
- Different methods of removal require varying amounts of manpower. Be sure the manpower is available for the method of removal selected and the members have the strength and ability to perform the removal.
- At the scene of a disaster, everyday items (doors, blankets, chairs, etc.) may be used to assist in the removal of victims. Improvise and use your imagination to solve problems.

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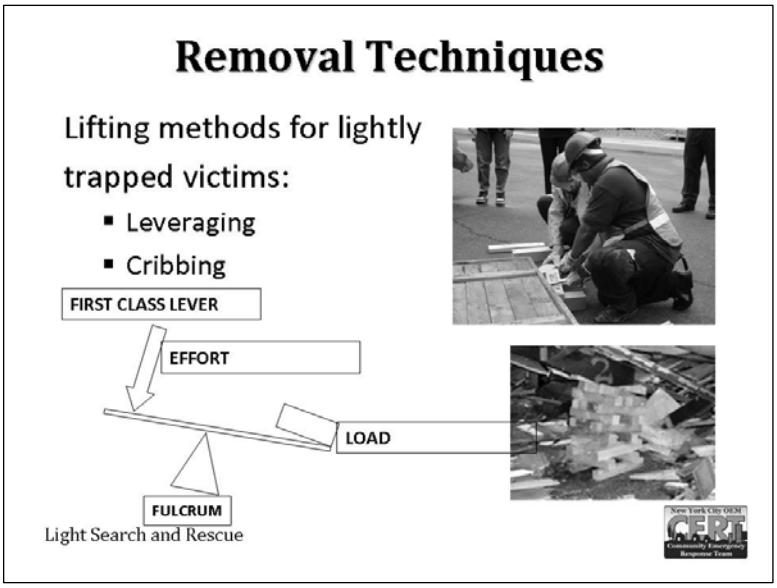


**Key Points**

- Use leverage when attempting to lift a heavy object. This will make your task much easier. A long lever and fulcrum (the pivot on which a lever moves) will ease the operation.
- Looking at the above illustration, the fulcrum should be closer to the object you are attempting to lift. The longer the effort side of the lever is, the easier it will be to raise the output side.
- When performing a lifting operation, the entire load must be watched so it does not shift out of balance. Cribbing is another method NYC CERT members can use to ensure a safe operation for rescuers and the victim.
- Cribbing is using smaller pieces of wood to stabilize a load that is being lifted or that could possibly shift while rescuers are operating nearby.

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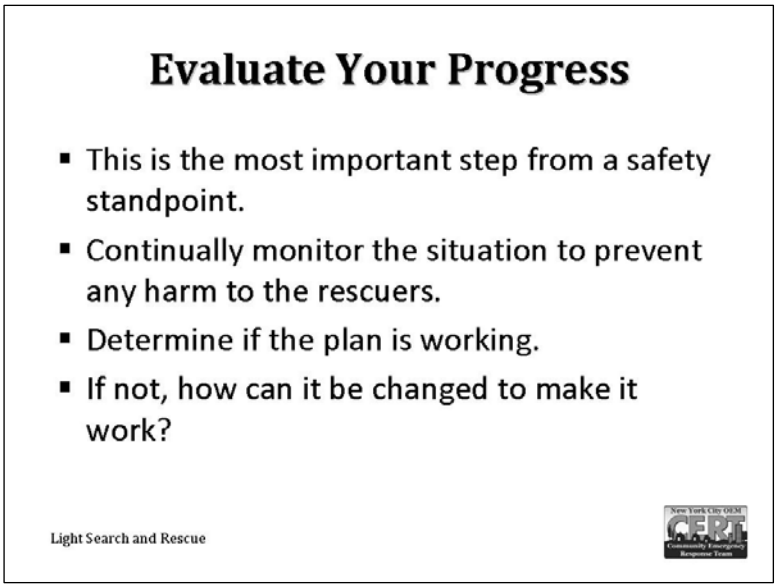


**Key Points**

- NYC CERT members must evaluate the effectiveness of their operation and adjust their approach if necessary. It is easy to get tunnel vision when involved in an operation and the light search and rescue group leader must evaluate whether the team is working safely and effectively.
- The light search and rescue group leader should not be involved in hands-on activities but must step back, evaluate the group and maintain a supervisory role over team members.
- Supervision, training, and discipline are the keys to safely accomplishing your goals.

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## Victim Tracking

- Remove victims to a casualty collection point.
  - Triage.
  - Separate victims by triage tag.
- If victims are removed prior to arrival of first responders CERT should record:
  - Name of victim,
  - Name of hospital, and
  - Nature of injury.

Light Search and Rescue

**Key Points**

- When victims are removed from danger it is important to gather them in a central area where they can be further triaged and treated for their injuries.
- Injured victims may be a source of detailed information about remaining occupants and the circumstances which led to the collapse.
- Separate the victims into groups based on the color of their triage tags. This will allow emergency medical personnel to treat and transport them more efficiently.
- NYC CERT recorder should gather the total number of victims, the number in each triage category, the victims' names, nature and extent of their injuries and to which hospitals they are being sent. This information should be transferred to first responders.

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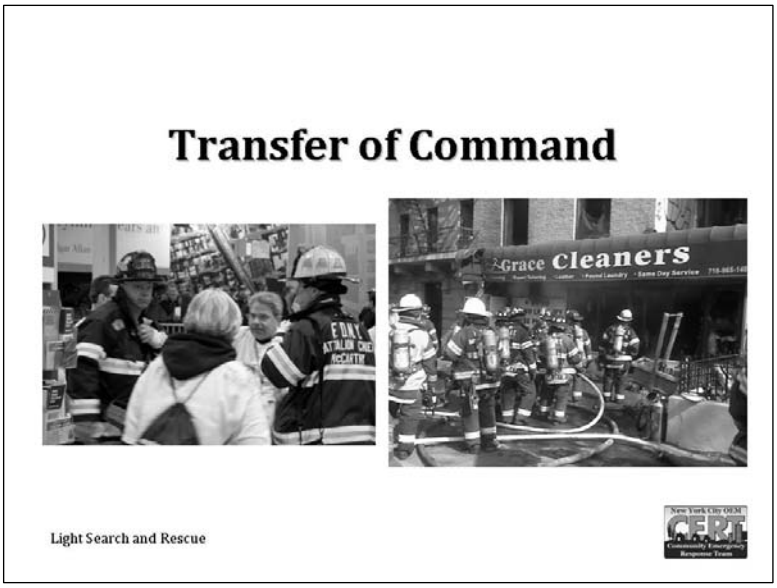


**Key Points**

- The NYC CERT lead will brief the first arriving emergency responders.
- The NYC CERT lead will inform the emergency responders about:
  - What the team found when it arrived.
  - What actions the team has taken prior to the arrival of emergency responders.
  - Where team members are currently operating.
- The documentation of team operations and victim tracking by the team recorder will be the framework for the transfer of command.
- The NYC CERT lead should ask if there is anything further the NYC CERT team can do to assist first responders.
- The NYC CERT lead will inform the team of new assignments or tell the members to withdraw to a designated area.

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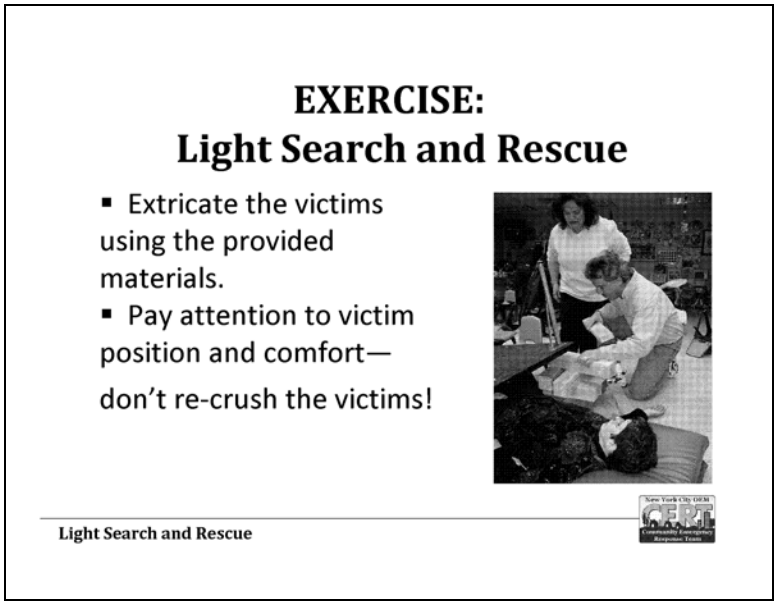


**Key Points**

- CERT Response Protocols
- ICS Organization
- Possible CERT Roles
- CERT Safety

| Notes: |
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## LESSONS LEARNED

- Understand the role of CERT teams in a search and rescue incident.
- Know how to complete a damage assessment and set up your team in ICS to deploy and be a resource.
- Know how to properly complete a size-up before acting on a plan.
- Learn and practice basic search and rescue techniques with proper materials.

## COMMUNITY AWARENESS

- What lessons were learned in this unit that you might bring to your community?

- What message have you learned this week that you might stress during a Ready NY presentation?

## PREPARING FOR YOUR FINAL WEEK

The safety considerations you must prepare for during a light search and rescue incident are extremely important. During your disaster simulation, you will also have other types of response you will need to coordinate. Make sure you know the proper and safe light search and rescue techniques and practice them with your fellow classmates.

## EVALUATION

Please fill out the evaluation for Unit 8 in the back of the binder. When completed, please hand in to your OEM Liaison.

UNIT RESOURCES

**CERT Search and Rescue Size-up Checklist**

**Step 1: Gather Facts**

| *Time* | **Yes** | **No** |
|---|---|---|
| ▪ Does the time of day or week affect search and rescue efforts? | ☐ | ☐ |
| How? | | |

*Type Of Construction*

- What type(s) of structure(s) is(are) involved?

- What type(s) of construction is (are) involved?

| *Occupancy* | **Yes** | **No** |
|---|---|---|
| ▪ Are the structures occupied? | ☐ | ☐ |
| If yes, how many people are likely to be affected? | | |
| ▪ Are there special considerations (e.g. children, elderly)? | ☐ | ☐ |
| If yes, what are the special considerations? | | |

| *Weather* | **Yes** | **No** |
|---|---|---|
| ▪ Will weather conditions affect your safety? | ☐ | ☐ |

If yes, how will your safety be affected?

- Will weather conditions affect the search and rescue situation? ☐ ☐

  If yes, how will the search and rescue situation be affected?

| *Hazards* | **Yes** | **No** |
|---|---|---|
| ▪ Are hazardous materials involved? | ☐ | ☐ |
| If yes, what hazardous materials? | | |
| ▪ Are any other types of hazards likely to be involved? | ☐ | ☐ |
| If yes, what other hazards? | | |

| **Step 2: Assess and Communicate the Damage** | **Yes** | **No** |
|---|---|---|
| ▪ Take a lap around the building. Is the damage beyond the CERT team's capability? | ☐ | ☐ |
| If yes, what special requirements or qualifications are required? | | |
| ▪ Are normal communication channels functioning? | ☐ | ☐ |

**Step 3: Consider Probabilities**

| *Life-Threatening Hazards* | **Yes** | **No** |
|---|---|---|

| | | |
|---|---|---|
| ▪ Are there potentially life-threatening hazards? | ☐ | ☐ |
| If yes, what are the hazards? | | |

| *Additional Damage* | **Yes** | **No** |
|---|---|---|
| ▪ Is there great risk or potential for more disaster activity that will impact personal safety? | ☐ | ☐ |
| If yes, what are the known risks? | | |

| **Step 4: Assess Your Own Situation** | **Yes** | **No** |
|---|---|---|
| ▪ What resources are available with which you can attempt the search and rescue? | | |
| ▪ What equipment is available? | | |

| **Step 5: Establish Priorities** | **Yes** | **No** |
|---|---|---|
| ▪ Can a search and rescue be *safely* attempted by CERT members? | ☐ | ☐ |
| If no, do *not* attempt a search and rescue. | | |
| ▪ Are there other, more pressing needs at the moment? | ☐ | ☐ |
| If yes, list. | | |

| **Step 6: Make Decisions** | **Yes** | **No** |
|---|---|---|

- Where will deployment of available resources do the most good while maintaining an adequate margin of safety?

**Step 7: Develop Plan of Action** **Yes** **No**

- Determine how personnel and other resources should be deployed.

**Step 8: Take Action**

- Put the plans into effect.

**Step 9: Evaluate Progress**

- Continually size up the situation to identify changes in the:
  - Scope of the problem.
  - Safety risks.
  - Resource availability.
- Adjust strategies as required.

***Search and Rescue Size Up***

**Step 1: Gather Facts**

The facts of the situation must guide your search and rescue efforts.

When gathering facts, you need to consider:

- The time of the event and day of the week. At night, more people will be in their homes, so the greatest need for search and rescue will be in residential settings. Conversely, during the day, people will be at work, so the greater need will be in commercial buildings.

Some emergency services resources are not available—or not available in the same numbers—during the evenings or on weekends. Search and rescue operations may also be affected by where people are located in their homes and the amount of daylight available.

- The type of structure. The purpose for which the structure was designed may indicate the likely number of victims and their location.
- Construction type. Some types of construction are more susceptible to damage than others.
- Weather. Severe weather will have an effect on victims and rescuers alike and will certainly hamper rescue efforts. Forecasts of severe weather should be considered as a limiting factor on the time period during which search and rescue efforts can occur.
- Hazards. Knowledge of other potential hazards in the general and immediate areas is important to search and rescue efforts. Time lost trying to locate and shut off utilities, for example, can have a big impact in terms of loss of life.

**Step 2: Assess and Communicate Damage**

There are general guidelines for assessing damage. When in doubt about the condition of a building, always use the more restrictive assessment. For example, if you are unsure about whether a building is moderately or heavily damaged, assume heavy damage. The CERT mission changes depending on the amount of structural damage.

**CERT Mission by Structural Damage Category**

| If Structural Damage Is . . . | Then The CERT Mission Is . . . |
|---|---|
| **Light:** | To locate, triage, and prioritize removal of victims to designated treatment areas by the medical operation teams. |
| **Moderate:** | Tape off the collapse zone and warn others of the danger. Conduct a perimeter survey for victims; interview bystanders; and call out to possible victims inside of the structure. Ensure no CERT member operates inside damaged building or its collapse zone. |
| **Heavy:** | To secure the building perimeter and warn others about the danger of entering the building. |

Light damage includes:

- Superficial damage.
- Broken windows.
- Fallen or cracked plaster.
- Minor damage to the interior contents.

Moderate damage includes:

- Visible signs of damage.
- Decorative work damaged or fallen.
- Many visible cracks in plaster.
- Major damage to interior content.

(Note that a moderately damaged building is still attached to the foundation.)

Do not enter a building with moderate damage.

Heavy damage includes:

- Partial or total collapse.
- Tilting.
- Obvious structural instability.
- Heavy smoke or fire.
- Hazardous materials inside.
- Gas leaks.
- Rising or moving water.

(Note that a heavily damaged building is not attached to the foundation.)

Do not enter a building with heavy damage under any circumstances.

Look at a building from all sides by doing a lap around it.

Communicate your findings to the CERT command post or responding agencies.

After, or in conjunction with, the damage assessment, CERT personnel must consider probable amounts of damage based on the type and age of construction. Experienced search and rescue personnel can determine probable damage to a structure based on the event and the types of structures involved.

**Step 3: Consider Probabilities**

Because the CERT members will be working in such close proximity to the dangerous situation, considering what will probably happen and what could happen are of critical importance. Identify potentially life-threatening hazards with an eye toward:

- How stable the situation really is. Even within a structure that appears from the outside to have only minimal or moderate damage, nonstructural damage or instability inside the structure can pose real danger to the rescue team. CERT members should think about what they already know about the structure that's been damaged. Are lawn chemicals, paints, or other potentially hazardous materials stored within the structure? How are they stored? Where are they? It won't take CERT members much time to answer these types of questions, but the answers could make a huge difference in how they approach the search.

- What else could go wrong? Based on the information gathered during steps one and two of the size-up, CERT members should take a few moments to play "What if?" to try to identify additional risks that they may face. What if the electricity fails during the search? What if a wall that appears stable shifts and collapses? Applying Murphy's Law (what can go wrong will) to the situation could save CERT members' lives.

- What it all means for the search and rescue. Based on the probabilities, CERT members should think about what they can do to reduce the risks associated with the probabilities they have identified. Is a spotter necessary to look for movement that could indicate a possible collapse and warn the rescue team? Is some remedial action required to stabilize nonstructural hazards before beginning the search? CERT search and rescue teams must remember that their own safety is the first priority.

**Step 4: Assess Your Situation**

Size-up is a building process, with each step building upon the previous steps until the decision is made to begin the search and rescue operation (or that the situation is unsafe). Draw on everything you've learned from steps one through three to assess the situation to determine:

- Whether the situation is safe enough to continue.
- The risks that rescuers will face if they continue.
- What resources will be needed to conduct the operation safely (and what resources are available).

Assessing resources is extremely important to search and rescue operations.

**Search and Rescue Resource Planning Questions**

| Resource | Planning Questions |
|---|---|
| Personnel | ▪ Who lives and/or works in the area?<br>▪ During which hours are these people most likely to be available?<br>▪ What skills or hobbies do they have that might be useful in search and rescue operations?<br>▪ What might be the most effective means of mobilizing their efforts? |
| Equipment | ▪ What equipment is available locally that might be useful for search and rescue?<br>▪ Where is it located?<br>▪ How can it be accessed?<br>▪ On which structures (or types of structures) might it be most effective? |
| Tools | ▪ What tools are available that might be useful for lifting, moving, or cutting disaster debris? |

**Step 5: Establish Priorities**

After evaluating the situation, the next step is to determine:

- What should be done?
- In what order?

The safety of CERT members is always the first priority and will dictate some of your other priorities. For example, removing or mitigating known hazards must be completed before teams begin to search. Think through the situation logically to determine how you should approach the operation.

**Step 6: Make Decisions**

You are at the point in the size-up where you will make decisions about where to deploy your resources to do the most good, while maintaining an adequate margin of safety. Many of your decisions will be based on the priorities established during step five. Those priorities are based on (in order):

1. The safety of CERT members

2. Life safety for victims and others

3. Protection of the environment

4. Protection of property

**Step 7: Develop Plan of Action**

Step seven is where all of the information you have about the situation comes together. During this step, the team leader will decide specifically how the team will conduct its operation, considering the highest priority tasks first.

Action plans do not need to be written, but, when search and rescue operations are required, the situation is probably complex enough that a written plan of some type should be developed. Even a simple written plan will:

- Help focus the operation on established priorities and decisions.
- Provide documentation to be given to responding agencies when they arrive.
- Provide documentation that can be used, if necessary, after the incident.

Keep a notebook for jotting notes when developing an action plan. These notes should include changes to the plan that are made based on new information that comes in.

**Step 8: Take Action and Step 9: Evaluate Progress**

The plan developed during step seven is put into action during step eight. Step nine, Evaluate Progress, is the most critical, not only in terms of evaluating whether the plan works, but also from a safety standpoint.

Size-up is ongoing. Information gained during step nine needs to be fed back into the decision-making process for possible revision of priorities and updated action planning.

**Safety Considerations**

Regardless of the severity of structural damage, rescuer safety must be the primary concern.

The two most frequent causes of rescuer deaths are:

- Disorientation.
- Secondary collapse.

Follow these guidelines during all search and rescue operations:

- Use a buddy system. Always work in pairs, with a third person acting as a runner.
- Be alert for hazards (e.g., power lines, natural gas leaks, hazardous materials, sharp objects, etc.).
- You should never attempt to search an area where water is present.
- Use safety equipment. Wearing gloves and a helmet will protect a rescuer's hands and head. Also, the primary cause of rescuer problems after working in a structural collapse is breathing dust, so a dust mask is essential. (However, a dust mask will not filter out harmful materials.)
- Have backup teams available to allow rotating of teams, prevent fatigue, and ensure help if a team gets into trouble. Have teams drink fluids and eat to keep themselves fresh.

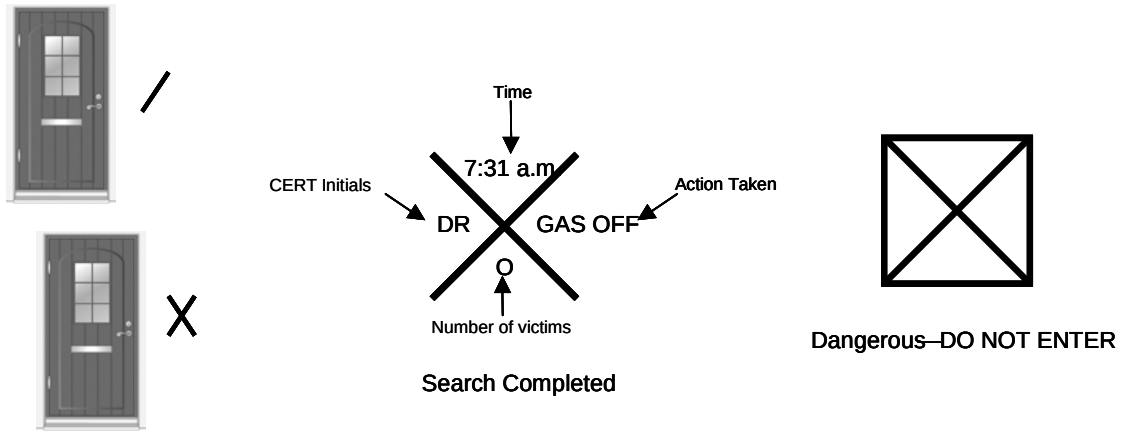
Successful search and rescue depends on teamwork.

**Conducting Search Operations**

An effective search system:

- Indicates rescuer location.

- Prevents duplication of effort.




**Marking Searched Areas**

When the decision is made to initiate search operations, CERT members must inspect the area assigned by the CERT area team leader.

The search operation involves two processes:

1. Employing search techniques based on the size-up.

2. Locating potential victims.

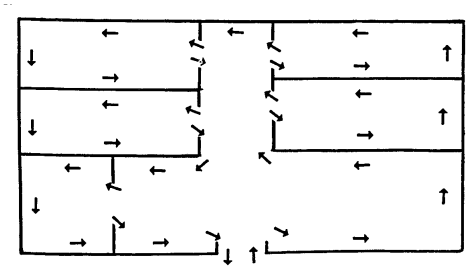
By using these processes, search operations will be more efficient, thorough, and safe. They will also facilitate later rescue operations.

Experienced search and rescue personnel have found these search methods to be effective:

1. Begin the search by calling out to victims. Shout something like, "If anyone can hear my voice, come here." If any victims respond, give them further directions such as "Stay here." or "Wait outside." Ask victims who respond for any information that they may have about the building or others who may be trapped.

2. Use a systematic search pattern. Ensure that all areas of the building are covered. Examples of systematic search patterns to use include:

   - Bottom-up/top-down.
   - Right wall/left wall.

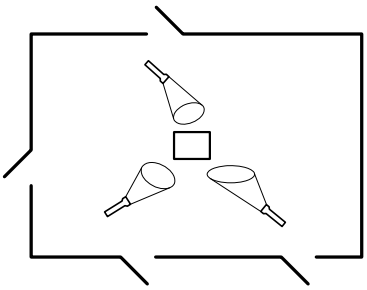


**Sample Systematic Room Search**

**Systematic Room-Search Pattern: bottom-up/top-down or right wall/left wall to ensure that the entire building is searched.**

3. Stop frequently to listen. Listen for tapping, movement, or voices.

4. Triangulate. Triangulation enables rescuers to view a single location from several perspectives. Three rescuers, guided by victim sounds, form a triangle around the area and direct flashlights into the area. The light shining from different directions will eliminate shadows that could otherwise hide victims.



**Triangulation**

**Triangulation: Three rescuers guided by victim sounds form a triangle around the area and direct flashlights into the areas. The light will help eliminate shadows.**

*Tip: It is important to move in a circle around the area while directing your flashlights so that there is less of a shadow that the object or area casts.*

5. Mark searched areas to document results. Make a single diagonal slash next to the door just before entering a structure. Make an opposite slash (creating an "X") when all occupants have been removed and search and rescue efforts have been completed. The "X" signals to other potential searchers that the area has already been searched. This method:

   - Indicates rescuer location.
   - Prevents duplication of effort.

6. Report results. Keep complete records both of removed victims and of victims who remain trapped or are dead. Report this information to emergency services personnel when they reach the scene.

---

The decision to attempt a rescue should be based on two factors:

- The risks involved to the rescuer
- The overall goal of doing the greatest good for the greatest number of people

Rescues involve three primary functions:

- Creating a safe rescue environment by lifting objects out of the way, using tools to move objects, and removing debris.
- Triaging or stabilizing victims.
- Removing victims in a moderately damaged building. Call in the medical team in a lightly damaged building.

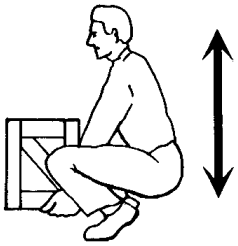
**Creating a Safe Environment**

There are three goals for all rescue operations:

- To maintain rescuer safety.
- To triage in lightly and moderately damaged buildings.
- To evacuate victims as quickly as possible from moderately damaged buildings while minimizing additional injury.

None of these goals can be achieved without creating as safe an environment as possible before attempting rescue. There are, therefore, certain precautions that rescuers must take to minimize risk.

- Know your limitations. Many volunteers have been injured or killed during rescue operations because they did not pay attention to their own physical and mental limitations. CERT rescuers should take the time to eat, drink fluids, rest, and relax so that they can return with a clear mind and improved energy.
- Follow safety procedures. CERT members should always use the proper safety equipment required for the situation and follow established procedures, including:
    - Working in pairs.
    - Never entering an unstable structure.
    - Lifting by bending the knees, keeping the back straight, and pushing up with the legs.
    - Carrying the load close to the body.
    - Lifting and carrying no more than is reasonable.



**Proper Body Position for Lifting**

**Proper Body Position for Lifting showing the back straight and lifting with the knees.**

You may encounter situations in which debris needs to be moved to free victims. In these situations, CERT rescuers should consider leveraging and cribbing to move and stabilize the debris until the rescue is complete.

- Leveraging is accomplished by wedging a lever under the object that needs to be moved, with a stationary object underneath it to act as a fulcrum. When the lever is forced down over the fulcrum, the far end of the lever will lift the object.

- A crib is a wooden framework used for support or strengthening. Box cribbing means arranging pairs of wood pieces alternately to form a stable rectangle.

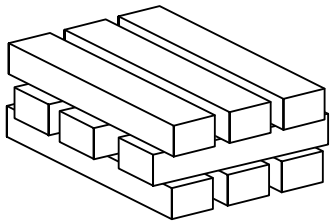
Leveraging and cribbing are used together by alternately lifting the object and placing cribbing materials underneath the lifted edge to stabilize it. Safety is number one: "Lift an inch; crib an inch."

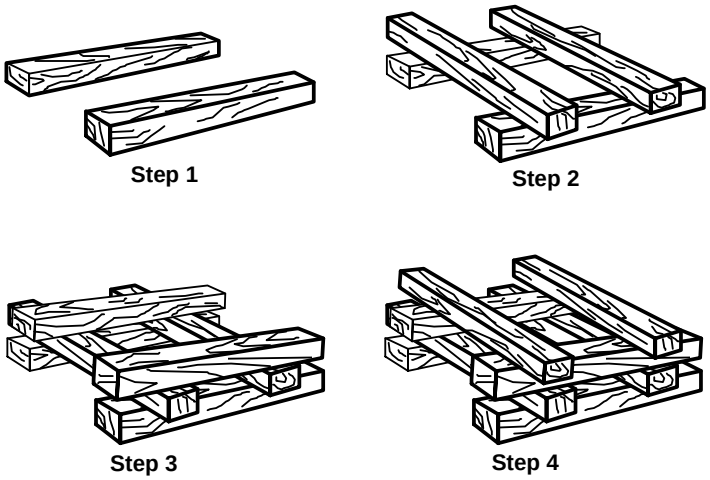
Leveraging and cribbing should be gradual—both for stability and to make the job easier. It may also be necessary to use leveraging and cribbing at more than one location (e.g., front and back) to ensure stability.

When you are able to achieve sufficient lift, remove the victim and reverse the leveraging and cribbing procedure to lower the object.

When you must remove debris to locate victims, you should set up a human chain and pass the debris from one person to the next. Set up the chain in a position that will not interfere with rescue operations. Wear leather gloves to protect your hands.

**Box Cribbing**






**Four steps for building box cribbing: Step 1: Position two pieces of wood parallel to each other on either side of the collapse. Step 2: Place two pieces of wood perpendicularly across the base pieces. Steps 3 and 4: Add additional layers of wood, with each perpendicular to the previous level.**

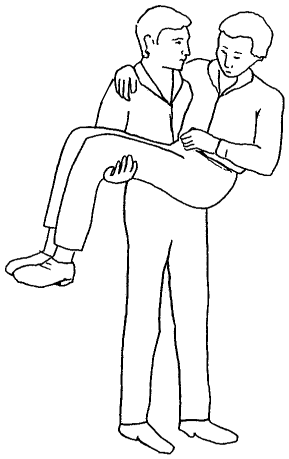
The type of extrication method selected should depend on the:

- General stability of the immediate environment.
- Number of rescuers available.
- Strength and ability of the rescuers.
- Condition of the victim.

If safety and time permit, you should not use lifts and drags to remove victims when a closed-head or spinal injury is suspected. In such cases, the spine must be stabilized using a backboard. Doors, tables, and similar materials can be used as improvised backboards. The backboard must be able to carry the person, and proper lifting techniques must be used. When moving victims, rescuers must use teamwork and communication, and keep the victim's spine in a straight line. Remember, rescuer safety and the condition of the building will dictate the approach.

There are several types of lifts and carries. For example, if the rescuer is physically able and the victim is small, he or she may use the one-person arm carry to lift and carry the victim by:

- Reaching around the victim's back and under the knees.
- Lifting the victim while keeping your back straight and lifting with the legs.

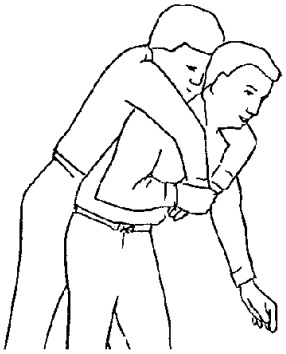


**One-Person Arm Carry**

**One-Person Arm Carry, which shows the rescuer holding the victim around the victim's back and under the knees.**

**Note:** Consider the size of the victim and the distance he or she needs to be carried before using this carry.
Another way for a single rescuer to lift a victim safely is by using the one-person pack-strap carry. Using this method, the rescuer should follow the steps outlined below:

- Step 1: Stand with his or her back to the victim.
- Step 2: Place the victim's arms over the rescuer's shoulders and grab the hands in front of the rescuer's chest.
- Step 3: Hoist the victim by bending forward slightly, until his or her feet just clear the floor.



**One-Person Pack-Strap Carry**

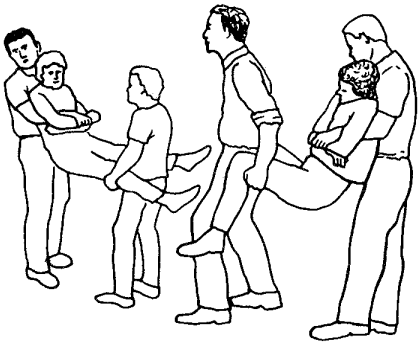
**One-Person Pack-Strap Carry in which the rescuer places the victim's arms over his or her shoulder and grabs the victim's hands over his or her chest, then hoists the victim by bending over slightly.**

Victim removal is easier when multiple rescuers are available. With two rescuers, a victim may be removed using a two-person lift.

- Rescuer 1: Squat at the victim's head and grasp the victim from behind around the midsection. Reach under the arms and grasp the victim's forearms.

- Rescuer 2: Squat between the victim's knees, facing either toward or away from the victim. Grasp the outside of the victim's legs at the knees.

- Both rescuers: Rise to a standing position, keeping backs straight and lifting with the legs. Walk the victim to safety.

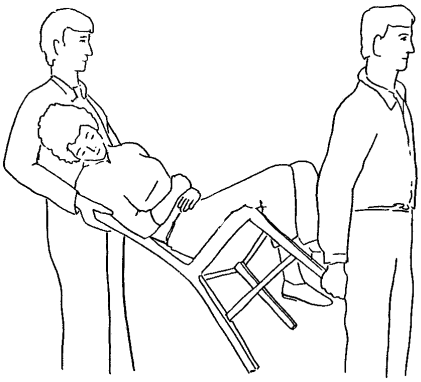


**Two-Person Carry**

**Two-Person Carry in which rescuer 1 squats at the victim's head and grasps the victim from behind at the midsection. Rescuer 2 squats between the victim's knees, grasping the outside of the knees. Both rescuers rise to a standing position.**

Two rescuers can also remove a victim by seating him or her on a chair:

- Rescuer 1: Facing the back of the chair, grasp the back uprights.
- Rescuer 2: Facing away from the victim, reach back and grasp the two front legs of the chair.
- Both rescuers: Tilt the chair back, lift, and walk out.



**Chair Carry**

**Chair Carry in which the victim is placed in a chair and tilted backward as rescuers lift the victim. This carry requires two rescuers.**

You can use the blanket carry for victims who cannot be removed by other means. The blanket carry requires at least six rescuers to ensure stability for the victim, and one rescuer must be designated the lead person:

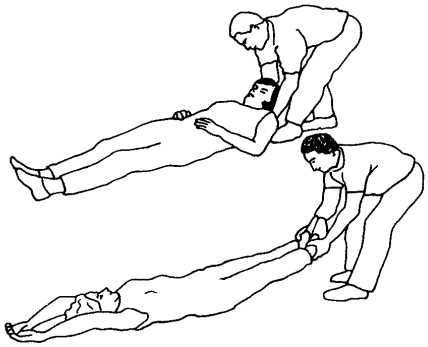
- Step 1: Lay a blanket next to the victim.
- Step 2: Tuck the blanket under the victim, and roll the victim into the center of the blanket.
- Step 3: With three rescuers squatting on each side and grasping a "handle," the lead person checks the team for even weight distribution and correct lifting position. *Make sure to lift the victim head first to avoid injury to the head.
- Step 4: The lead person calls out, "Ready to lift on the count of three: One, two, three, *lift.*"
- Step 5: The team lifts and stands in unison— keeping the victim level—and carries the victim feet first.

The team must also lower the victim together, using the following steps:

- Step 1: The lead person calls out, "Ready to lower on the count of three: One, two, three, *lower.*"
- Step 2: The team lowers the victim in unison, exercising caution to keep the victim level.

A variety of materials—such as blankets—can be used as improvised stretchers.

Rescuers can also drag a victim out of a confined area by grasping either under the arms or by the feet and pulling across the floor. However, unless there is no other way to remove the victim and the victim's removal is time critical, you should not use this drag when debris may cause additional injury.

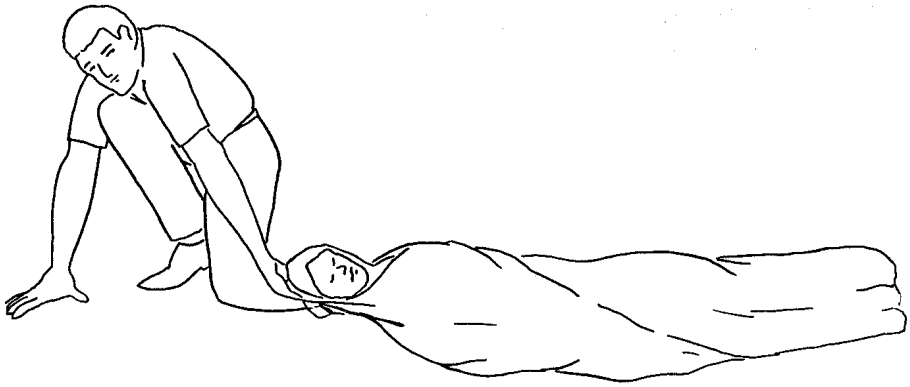


**Correct Drag Techniques**

**Correct Drag Technique, showing the rescuer grasping the victim by either the feet or shoulders and dragging him or her clear of the hazard.**

When necessary, one rescuer can use the blanket drag by following these steps:

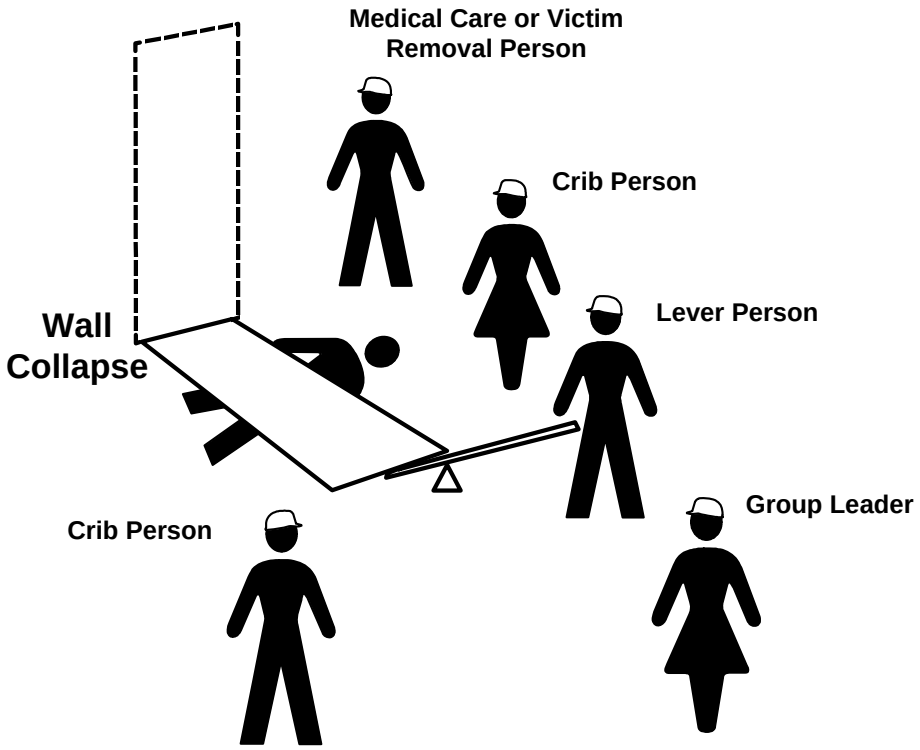
- Step 1: Wrap the victim in a blanket.
- Step 2: Squat down and grasp an edge of the blanket.
- Step 3: Drag the victim across the floor.



**Blanket Drag**

**Blanket Drag, showing the victim wrapped in a blanket with the rescuer squatting at the victim's head. The rescuer grasps the blanket behind the victim's head and drags him or her clear of the hazard.**

**Arrangement for Leveraging/Cribbing Operation**




**Team Organization for Leveraging/Cribbing Operation, showing the victim underneath a collapsed wall and the CERT members at the following locations:**

- **Group Leader: In front of collapse, positioned so that he or she can view the entire operation while remaining out of the rescuers' way.**
- **Lever Person: At the front edge of the collapsed wall and positioned so that he or she can position a fulcrum and lever under the wall.**
- **Crib Persons: On either side of the collapsed wall and positioned to enable the placement of cribbing as the wall is raised with the lever.**
- **Medical Care/Victim Removal Person: Next to the Crib Person who is closest to the victim's head.**

**Leveraging/Cribbing Operation**

1. Conduct a size-up of the scene: Gather facts, identify hazards, and establish priorities.

2. Have one person in charge and formulate a plan of action based upon the information you have received. Identify how and where to lift and crib.

3. Gather necessary materials for lifting/cribbing operations:

   - Lever
   - Fulcrum
   - Cribbing blocks
   - Spacers/wedges

4. Use cribbing materials to stabilize the object prior to lifting. (Set the foundation of the box crib.)

5. Distribute crib materials as necessary to be readily accessible during the lifting operation.

6. Prepare to lift the object: Assemble the lever and fulcrum at the previously identified location.

7. Have someone available to handle the victim.

8. Initiate the lift, using the lever and fulcrum for mechanical advantage.

9. As the object is lifted, add cribbing as needed; build on the foundation of the box crib.

10. When the object is adequately supported, remove the lever and fulcrum. The victim may then be removed.

11. Reinitiate the lift and begin removing cribbing materials, reversing the process by which the crib was built.

12. Progressively lower the object to the ground.

13. Reassemble the lifting/cribbing supplies to be available for additional operations.