

## Chapter 5: Rescuer and Ambulatory Victim Packaging

**Scope:** This chapter serves as an introduction to rescuer and ambulatory victim packaging.

**Terminal Learning Objective (TLO):** At the end of this chapter, the student will be aware of how to properly package rescuers and victims to safely and effectively complete a rope rescue operation.

**Enabling Learning Objectives (ELO):**

1. Describe rescue harnesses and rescuer packaging
2. Demonstrate how to don a class ii harness
3. Demonstrate how to package a victim in a commercial victim harness
4. Demonstrate how to package a victim in a hasty pelvic harness

Proper packaging of rescuers and victims is essential to a safe and effective rope rescue operation. It is imperative that all rescuers have the knowledge, skill, and ability to efficiently and effectively place a harness on themselves as well as an ambulatory victim.



Figure 5-1: Class II Harness



Figure 5-2: Class III Harness

### Rescuer Packaging

There are several commercially manufactured rescue harnesses available. The minimum standard for this course is NFPA 1983 Class II harnesses. A Class III harness may be used if equipped with a front waist D-ring for low angle attachments to the rope system. Harnesses are required for all rescuers going over the edge as well as those positioned within ten feet of the edge.

- Package rescuers per manufacturer's specifications.
  - Proper fit of harnesses on students/rescuers must be ensured by qualified instructor.

## Sample NFPA Class II Harness Instruction Card

### USER INSTRUCTIONS

NFPA Standard 1983 recommends separating the user instructions from the harness and retaining them in permanent record. The standard also recommends making a copy of the instructions to keep with the harness and that the instructions should be referred to before and after each use. Additional information regarding life safety harnesses can be found at least in the NFPA 1500, Standard on Fire Department Occupational Safety and Health Program and NFPA 1983, Standard on Fire Service Life Safety Rope and System Components.

### INSPECTING YOUR HARNESS

Inspect the harness according to your department's policy for inspecting life safety equipment. The harness should be inspected after each use by an inspector that meets your department's training standard for inspection of life safety equipment. Record the date of the inspection and the results in the equipment log or on a tag that attaches to the harness. Each user should be trained in equipment inspection and should do a cursory inspection before each use.

When inspecting the harness, check the webbing for cuts, worn or frayed areas, broken fibers, soft or hard spots, discoloration, or melted fibers. Check the stitching for pulled threads, abrasion, or breaks. Check the hardware for damage, sharp edges, and improper operation. If any of the above is noted, or if the harness has been subjected to shock loads, fall loads, or abuse other than normal use, remove the harness from service and destroy it. If there is any doubt about the serviceability of the harness, remove the harness from service and destroy it.

### PUTTING ON YOUR HARNESS

Loosen the waist strap and leg loops as far as possible, but do not pull the web out of the buckles. Hold the harness in front of you. Make sure the D-ring loop is in front and the leg loops are not twisted. Lower the harness until the leg loops are laying on the ground in the proper position. Step over the waist belt and into the leg loops.

Pull the harness up around your hips and tighten the waist strap until it is snug and the D-Ring is centered. Next, adjust the leg loops to the desired tightness. In most cases, snug waist and leg loops provide the best comfort. Time spent practicing donning the harness and adjusting the straps will increase your level of comfort and your ability to quickly put on and adjust the harness.

***WARNING: Make sure that the harness fits snugly and that all the buckles are secure before using the harness. Make sure the ends of all straps are secured or are tied off using an overhand knot as shown on the right. When wearing the harness, double-check the buckles, adjusters, and fit of the harness immediately prior to relying on it for support. High impact fall situations should be avoided. Always keep the safety line (belay) above the wearer. Always minimize the slack in the safety line. To prevent roll out, always use locking carabiners when connecting to the D-Rings.***

### USING YOUR HARNESS

For ascending, descending, and static belays, use a carabiner to connect directly to the front, waist D-Ring. There is plenty of room for extra carabiners. The CMC Rescue Harness is not intended for rock climbing. Lead climbing ropes should not be tied into the D-Ring or connected into it with a carabiner.

### CARRYING, MAINTENANCE, AND STORAGE

During use, carrying, and storage, keep the Utility Harness away from acids, alkalis, exhaust emissions, rust and strong chemicals. Do not expose the harness to flame or high temperatures. Carry the harness where it will be protected as it could melt or burn and fail if exposed to flame or high temperatures. If the Utility Harness becomes soiled, it can be washed in cold water with a mild detergent. Dry out of direct sunlight. Do not dry in an automatic dryer. Store in a cool, dry location. Keep the harness away from acids, alkalis, exhaust emissions, rust or strong chemicals during storage or use. Do not store where the equipment may be exposed to moist air, particularly where dissimilar metals are stored together.

## Ambulatory Victim Packaging Overview

Rope rescues will often involve victims that do not need to be carried out of a steep environment in a rescue litter. Often, they have simply become stuck on a steep cliff or hillside. Other times they may have been minorly injured during a fall of some type. In these situations, the rescuer must be able to quickly and effectively secure the victim with a harness and into the rope rescue system. Once the victim is secured to the system, they can walk along with the ropes as they are raised or lowered to a safe environment. Rescuers have historically performed this task with a Hasty Harness tied out of webbing. In recent years, commercial victim pelvic harnesses have become available and are now the preferred method for packaging ambulatory victims if available.

## **Ambulatory Victim Packaging**

### ***Method 1: Commercial Victim Pelvic Harness***

There are a variety of commercially manufactured victim pelvic harnesses on the market. All models attach quickly and securely around the waist and thighs or under buttocks no matter where or how the victim is positioned. The design allows the harness to be put on without the victim having to step into the harness. Package victim per manufacturer's specifications.



Figure 5-3: Commercial Victim Harness

## Sample Victim Harness Instructions

The ProSeries Lifesaver™ Victim Harness is intended for use on a victim and not as a harness for the rescuer. With proper training and adequate practice, a rescuer should be able to quickly secure a victim with the waist strap then add the leg loops for safer support. The straps are color coded to simplify connecting the correct buckle and V-Ring in order to prevent uncomfortable twists in the harness.

While the Lifesaver™ can be used in any situation where the victim needs a harness, it is particularly valuable when the victim is in a precarious position and the rescuer is working on rappel.

Before using the Lifesaver™ Harness in a high angle rescue, or training, practice putting the harness on while on the ground. As in any rescue situation, proper safety precautions and appropriate belays should be used for rescuer and victim.

### **USER INSTRUCTIONS**

NFPA Standard 1983 recommends separating the user instructions from the harness and retaining the instructions in a permanent record. The standard also recommends making a copy of the instructions to keep with the harness and that the instructions should be referred to before and after each use.

Additional information regarding life safety harnesses can be found at least in the NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program* and NFPA 1983, *Standard on Fire Service Life Safety Rope and System Components*.

## INSPECTING YOUR HARNESS

Inspect the harness according to your department's policy for inspecting life-support equipment. The harness should be inspected after each use and at least once a year by an inspector that meets your department's training standard for inspection of life-support equipment. Record the date of the inspection and the results in the equipment log or on a tag that attaches to the harness. Each user should be trained in equipment inspection and should do a cursory inspection, and check component compatibility before each use.

When inspecting the harness, check the webbing for cuts, worn or frayed areas, broken fibers, soft or hard spots, discoloration, or melted fibers. Check the stitching for pulled threads, abrasion, or breaks. Check the hardware for damage, sharp edges, and improper operation. If any of the above is noted, or if the harness has been subjected to shock loads, fall loads, or abuse other than normal use, remove the harness from service and destroy it. If there is any doubt about the serviceability of the harness, remove the harness from service and destroy it. When operating under EN standards the user should retire the harness 5 years after date in service, regardless of its condition.

## PREPARATION

After inspection, the Lifesaver™ Harness should be packed in its distinctive blue storage bag so that it is ready for the next deployment. Start by pulling the leg V-Rings all the way to the end of the straps. Then fold the leg straps back and forth and secure them with the hook and loop strap. Be sure to position the V-Ring so that it can be pulled down and towards the center. Pull the waist strap V-Ring all the way to the end. Do not connect the waist buckles. Stuff the harness into the bag so that the waist loop (orange) is at the top.

## PUTTING ON THE HARNESS

We use the following method for putting on the harness for the most common situations. Practice with this method should allow you to modify the steps to meet unusual situations.

1. Start by pulling the waist loop (orange) out of the bag. Attach a carabiner to it and clip it onto the victim's anchorage point. This could be:
  - To your descender with a Pick-off or Multi-loop Strap.
  - To a separate rope intended for the victim.
  - To your rope with a prusik hitch or ascender.

In any situation, the anchorage point should be above the victim. Tighten the drawstring so the harness does not fall out on the way down and make sure the bag will not interfere with your rappel.

2. Rappel to a position level with and to the left of the victim. Lock off your descender and secure your belay.
3. Pull the drawstring to open the bag and remove the harness completely out of the bag. Hold the waist buckle (black) in your left hand. The waist loop (orange) should be next to your wrist. The "ProSeries" label should be towards the victim.
4. Reach around and clip the waist V-Ring into its buckle. Center the waist loop (orange) to the victim's front and tighten the waist belt snugly. Take up any slack in the victim's belay.
5. Pull the leg loops down, between the legs, and to the outside of the victim's body.
6. Clip the V-Rings into the buckles of the matching color. Pull the ends to tighten so the leg loops fit snugly. If you are concerned about the buckles slipping, tie an overhand knot in the end of all the straps.
7. Check the following:
  - The V-Rings are securely clipped into each buckle.
  - The harness is snug and not pinching or binding.
  - The buckles are not causing the victim any discomfort.
  - The victim's carabiners are locked.

- The slack is out of the system.

*To prevent roll out when using carabiners to attach to an attachment point, use only locking models. If using manual locking carabiners, verify that they are locked before use. Follow your industry's protocol for selecting compatible connectors and system components.*

**CARRYING, MAINTENANCE, AND STORAGE**

During use, carrying, and storage keep the harness away from acids, alkalis, exhaust emissions, rust and strong chemicals. Do not expose the harness to flame or high temperatures. Carry the harness where it will be protected as the harness could melt or burn and fail if exposed to flame or high temperatures.

This harness is comprised of nylon webbing and thread. If the harness becomes soiled, it can be washed in cold water with a mild detergent. For decontamination, the strap may be cleaned per your department's protocols on biohazards. Dry before stowing. Dry out of direct sunlight. Do not dry in an automatic dryer. Store in a cool, dry location.

**REPAIR**

CMC Rescue recommends that all repair work be done by the manufacturer. All other repair work or modification of the harness performed elsewhere may void the warranty, and releases CMC Rescue from all liability and responsibility as the manufacturer.

**SAMPLE INSPECTION AND MAINTENANCE LOG**

The sample log suggests records that should be maintained by the purchaser or user of rescue equipment.

**Equipment Inspection and Maintenance Log**

Item \_\_\_\_\_ # \_\_\_\_\_ Date of Purchase \_\_\_\_\_

User Name \_\_\_\_\_ Date in Service \_\_\_\_\_

Brand/Model \_\_\_\_\_ Size \_\_\_\_\_

Date                How Used or Maintained                Comments                Name

Date	How Used or Maintained	Comments	Name



## Method 2: The Hasty Pelvic Harness



Figure 5-4



Figure 5-5

1. Tie a 15-foot piece of webbing into a loop forming a sling using an overhand bend.
2. Place the overhand bend knot in the small of the rescuer's back at waist height with the rescuer's hands on either side of the bend.



Figure 5-6



Figure 5-7

3. Wrap the webbing around the waist creating bights at each hip and allowing the lower part of sling to hang behind the knees.
4. Slide both hands under the bights near the hips and move hands through the bights and over the front of the thighs.
5. Grasp the lower part of the sling near the knees with both hands.



Figure 5-8

6. Slide both hands back up over the thighs and through the bights at the hips while maintaining grip on lower part of loop with both hands.
7. This will create two bights of webbing. Hold them in one hand while you use the other to work any loose or slack webbing out around the waist and thighs.



Figure 5-9

8. Tie the two bights together by crossing the bight on the right over the left and pulling it up through the hole created.



Figure 5-10

9. Pull this knot snug.



Figure 5-11

10. Finish the knot by crossing the bight on the left over the bight on the right, pulling it up through the hole created, and forming a square knot.



Figure 5-12

11. Pull this knot snug.



Figure 5-13

12. Attach a carabiner through both bights.



Figure 5-14

13. Finished hasty pelvic harness.

The student must be able to attach this harness around himself or herself as well as a victim.



## Chapter 6: Types of Litters and Victim Packaging

**Scope:** This chapter serves as an introduction to rescue litters and victim packaging.

**Terminal Learning Objective (TLO):** At the end of this chapter, the student will be aware the role of the rescue litter and how to secure a victim in order to move over unstable terrain.

**Enabling Learning Objectives (ELO):**

1. Describe the types of rescue litters
2. Describe the specifics, advantages, and disadvantages of metal, metal/plastic, and plastic rescue litters
3. Demonstrate how to secure a victim to a rescue litter
4. Describe the considerations for packaging nonambulatory victims in unstable terrain

Rescue litters serve several purposes during rope rescue operations. They provide stabilization and protection for the victim to protect them against hazards such as protruding rocks while being evacuated. The litter also serves to provide a way for the rescuers to easily handle the victim over terrain. The rescue litter also provides a foundation to which ropes can be attached to assist in raising or lowering a victim on sloped terrain. Due to its size, a rescue litter is not easily used in confined space or limited access areas.

### Rescue Litters

The rescue litter, or Stokes basket as it is commonly referred to, has been the standard for victim removal over rough terrain for many years. It can be carried by hand over mild terrain, or used in tandem with ropes or ladders to negotiate steep or rough terrain. The rescue litter by itself does not provide spinal immobilization. A victim requiring C-spine immobilization should first be placed on a backboard, which is then placed inside the litter.

Rescue litters should be inspected regularly for bends, cracks, broken welds, and damage or wear to any plastic. Cleaning can be performed with mild soap and water. Decontamination can be accomplished as per department policies.

Litters come in a variety of shapes and materials. This course will discuss the three most common types of litters.

- ❶ Metal litters
- ❷ Metal/plastic litters
- ❸ Plastic litters

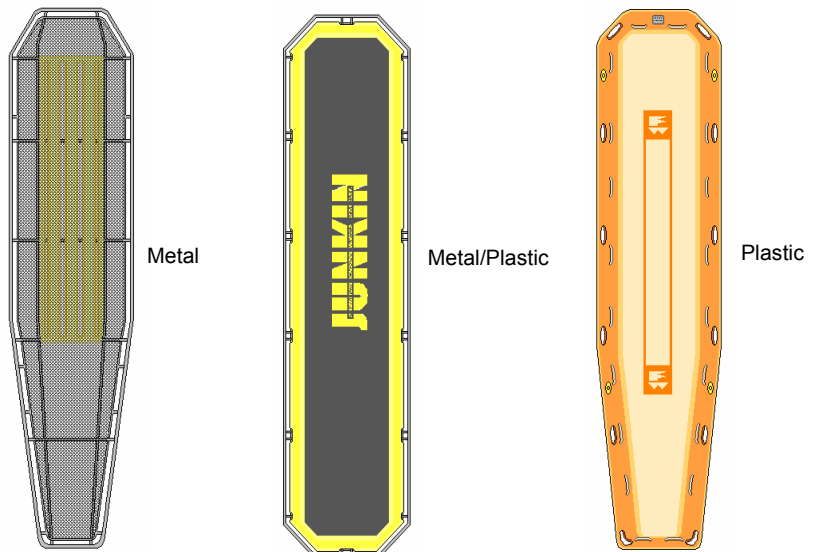


Figure 6-1: Common Litters

## Metal Litters

### Specifics

- The most commonly used rescue litter.
- Metal frame with wire, mesh, or nylon victim bearing surface.
- Various metals used for construction from heavy-duty steel to lightweight titanium.
- Multiple designs from rectangular to tapered leg models.

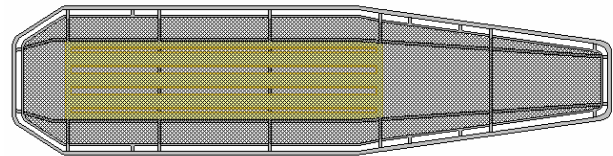


Figure 6-2: Metal Litter

### Advantages

- Excellent strength and durability.
- Multiple lashing options and points of attachment.

### Disadvantages

- Heavy and often bulky for confined spaces or restricted areas.
- May present a snagging or entanglement hazard.

## Metal/Plastic Litters

### Specifics

- Metal frame with a plastic shell attached to frame as victim bearing surface.
- Usually rectangular.

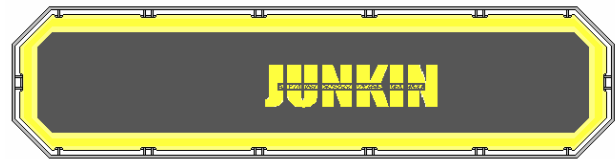


Figure 6-3: Metal/Plastic Litter

### Advantages

- Metal frame is strong and durable enough for rope rescue operations.
- Slides easily over obstacles.

### Disadvantages

- Limited lashing options and limited points of attachment.
- Plastic is vulnerable to wear and damage.
- Plastic will degrade if stored in sunlight for long periods of time.

## Plastic Litters

### Specifics

- Litter is a plastic shell with a metal rail that forms a ring around the rim of the litter.
- Usually rectangular in shape but may be tapered at the foot.

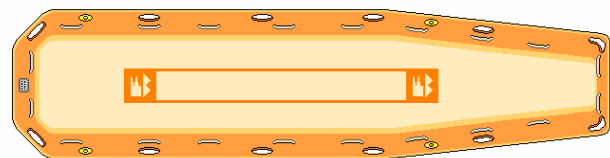


Figure 6-4: Plastic Litter

## **Advantages**

- Lightweight.
- Useful for snow and water evacuations.

## **Disadvantages**

- These litters are generally not the best choice for rope rescue operations due to their lack of structural stability.
- Limited lashing options and points of attachment.
- Plastic is vulnerable to wear and damage.
- Plastic will degrade if stored in sunlight for long periods of time.

## **How to Secure a Victim to a Rescue Litter**

Victim packaging is an essential skill for all rescuers. If a victim is insufficiently secured to the litter, existing injuries can be worsened, and new injuries can be created. Victims are generally secured to the litter with interior and exterior lashings. Interior lashing consists of chest and pelvic lashings, which keep the victim from sliding out the head or foot of the litter. External lashing consists of webbing or other straps that are arranged across the victim from one side of the litter to the other; this keeps the victim from coming out the top of the litter. All victim lashings should be secured to structural members of the litter other than the top rail to avoid abrasion. Interior and exterior lashings are commonly constructed using twenty-foot sections of webbing though longer sections may be needed with large victims.

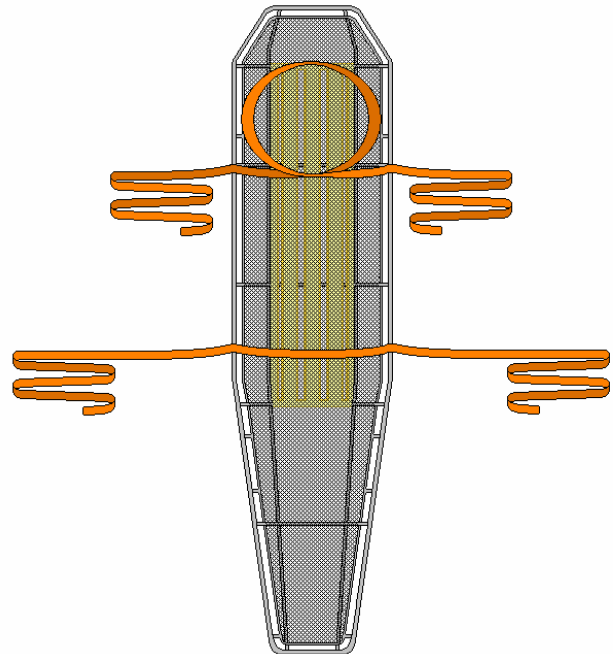


Figure 6-5: Steps 1 and 2 Prepping the Litter

## **Interior Lashing**

To improve efficiency, webbing should be placed into the rescue litter before the victim, and oriented as shown.

1. Lay a 20-foot piece of webbing across the litter with the middle at the point where the victim's crotch will be.
2. Form an 18" loop in the middle of a second 20-foot piece of webbing and lay it in the litter so that the top of the loop is where the top of the victim's head will be.

## Chest Lash

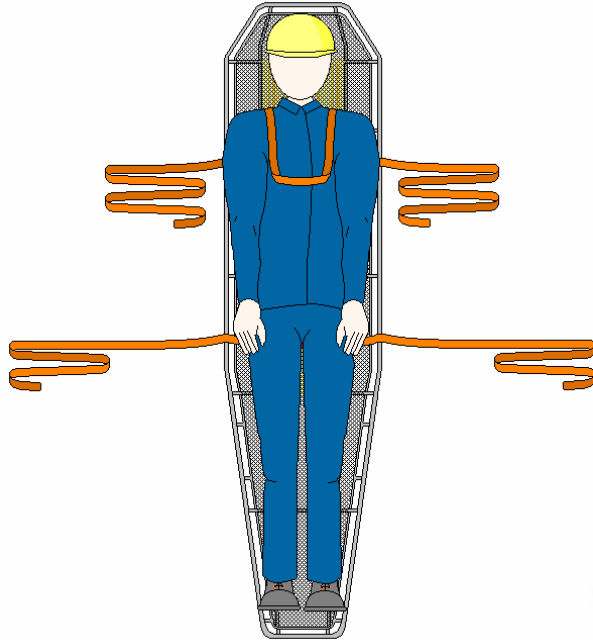


Figure 6-6: Step 1

1. Pass the loop over the victim's head to the victim's nipple line.

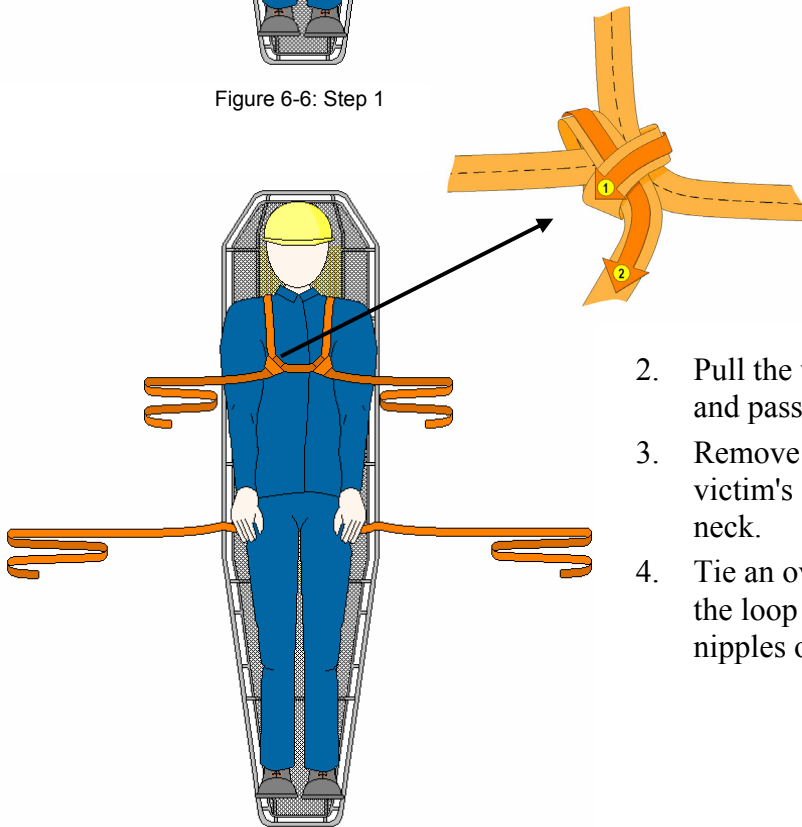


Figure 6-7: Steps 2-4

2. Pull the webbing ends from under each arm and pass through loop at chest.
3. Remove slack ensuring crossed webbing at victim's shoulder blades does not ride up on neck.
4. Tie an overhand knot in the webbing around the loop at the point it passes over the nipples on each side.



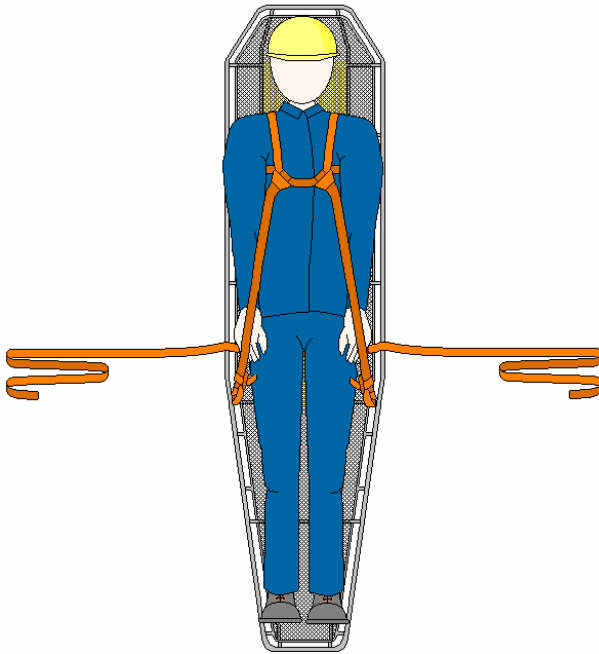


Figure 6-8: Steps 5 and 6

5. Tie a round turn and two half hitches at the ends of the webbing around a rib below the victim's waist where the rib meets the main frame.
6. Keep even tension between the two ends of the webbing when tying the knots.

## ***Pelvic Lash***

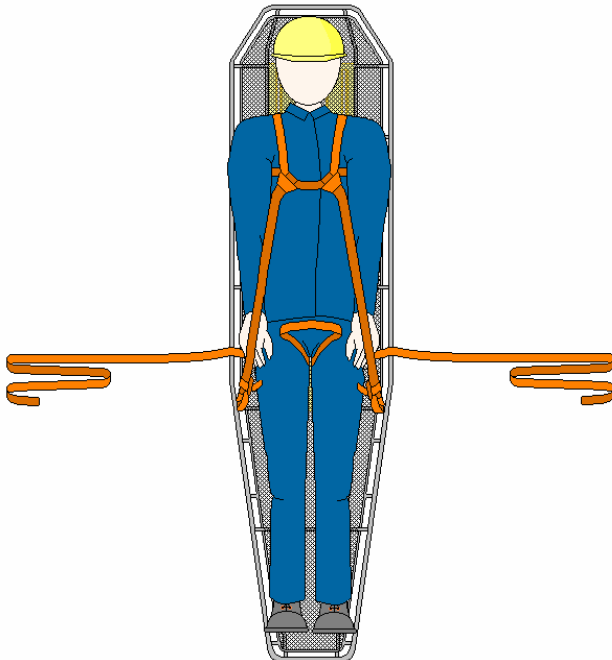


Figure 6-9: Step 1

1. Pull midpoint of webbing between legs up to victim's waist creating a 6" triangle.

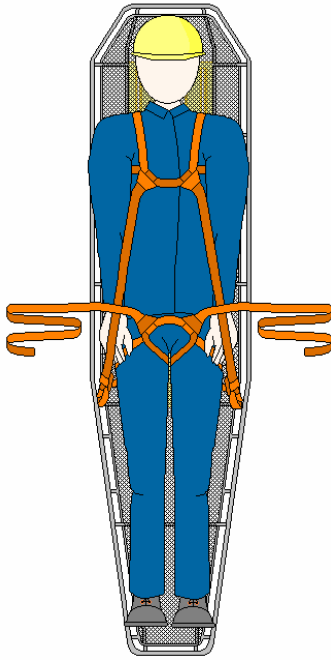


Figure 6-10: Steps 2 and 3

2. Pass ends of webbing around thighs and through triangle pulling up towards shoulders to remove slack.
3. Tie an overhand knot in the webbing on each side at the point it passes through the triangle.

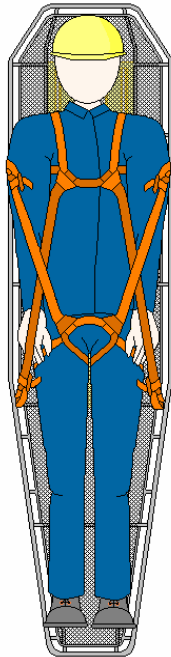


Figure 6-11: Steps 4 and 5

4. Tie a round turn and two half hitches at the ends of the webbing around a rib near the victim's shoulders where the rib meets the main frame.
5. Keep even tension between the two ends of webbing when tying the knots.

## Exterior Lashing

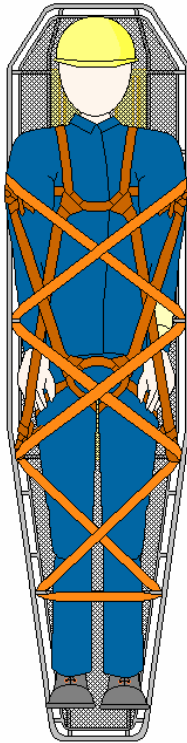


Figure 6-12: Steps 1-7

1. Place a 20-foot piece of webbing across the victim's legs with the mid point at or below the knees.  
**Note:** Depending on the victim's size, the 20-foot piece of webbing may be too short. Either tie another piece of 5- or 12-foot webbing to the 20-foot length or cut a 25- or 30-foot piece of webbing specifically for exterior lashing.
2. Pass the ends of the webbing around the rib at or below the victim's knees on both sides where the rib meets the main frame.
- DO NOT WRAP THE MAIN FRAME!**
3. Cross the webbing and pass the ends of the webbing around the next rib moving towards the head.
4. Repeat this operation until webbing passes around the ribs near the victim's shoulders.
5. Tie a round turn and two half hitches at one end of the webbing around the rib to secure the end.
6. Remove slack by pulling webbing from secured end toward free end.
7. Tie a round turn and two half hitches with the free end around the rib to secure the webbing.

## Alternative Victim Packaging (Optional)

There are several alternative methods available for lashing a victim to the litter. Many agencies are now using commercially available victim packaging equipment in place of the traditional webbing lashings. These methods of victim packaging are designed to make the job of packaging a victim more efficient. Each method has advantages and limitations and requires specific training for safe and efficient use. This text will present one method of alternative packaging. This method is **not** a FSTEP standard for victim packaging; it is an example of a regional standard developed through a local fire and EMS effort. The instructor may choose to incorporate local standards into his or her course content.

### Equipment Needed

- One rescue litter.
- One NFPA Class II harness or victim harness.
- One backboard.
- Two sets of adjustable Velcro "spider" straps.

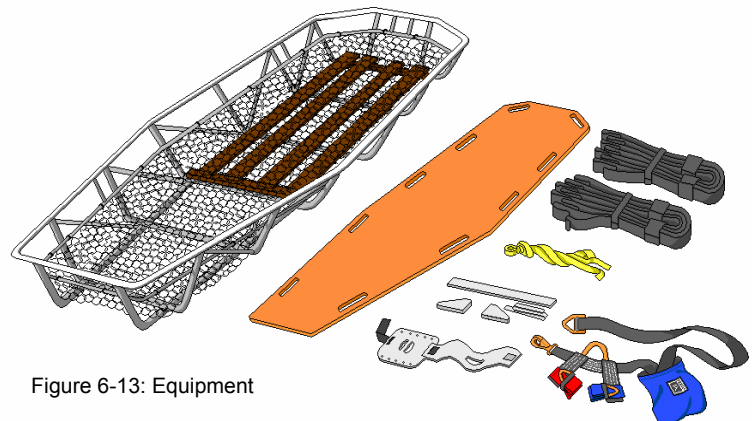


Figure 6-13: Equipment

- One C-spine and head immobilizer.
- One 12-foot section of webbing.

## Advantages

- Quick and reliable means of securing a victim to litter.

## Disadvantages

- Harnesses can be difficult to place around some victims.
- The number of victims may exceed the number of victim harnesses. In this case, the webbing hasty harness described in Chapter 5 should be considered.
- Adjustable Velcro "spider" straps are not well suited to use with children or very large adults due to minimal Velcro overlap. In this case consider:
  - Size specific adjustable Velcro "spider" straps, i.e., small or x-large.
  - Webbing exterior lashing.

## Uses

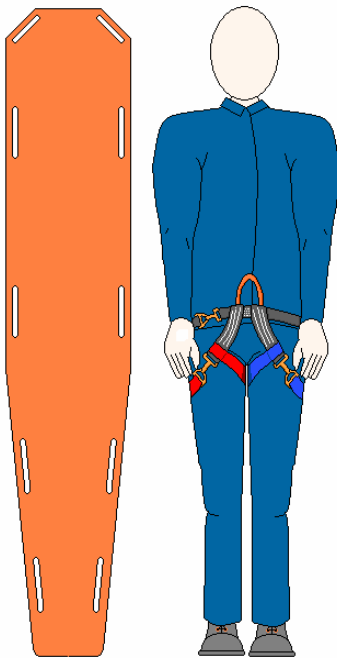


Figure 6-14: Step 1

1. Place a victim harness on the victim before placing in the backboard or litter.

2. If the victim requires C-spine immobilization, place on a backboard and secure per local protocols.

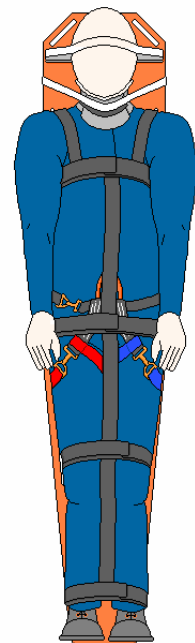


Figure 6-15: Step 2



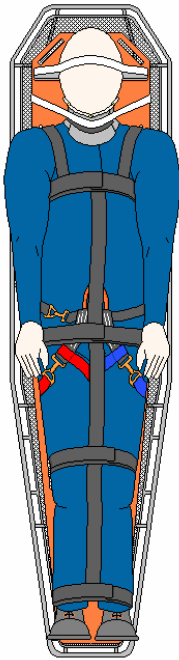


Figure 6-16: Step 3

3. Place the victim into the rescue litter.

4. Secure midpoint of 12-foot webbing to the victim harness attachment point with a lark's foot.
5. Secure the ends of the 12-foot webbing to the litter at or above the victim's shoulders with a round turn and two half hitches.

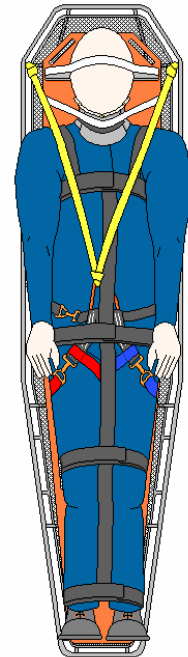


Figure 6-17: Steps 4 and 5

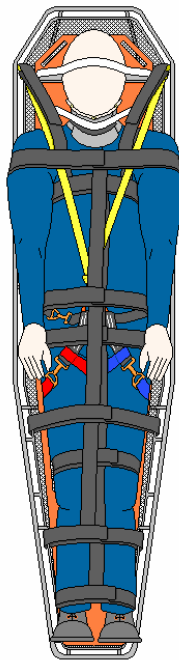


Figure 6-18: Steps 6-8

6. Place the adjustable straps along the body.
7. Secure the cross straps to the lower rail of the litter across chest, pelvis, femurs, and shins.
8. Place the shoulder straps over the shoulders and secure to the lower rail of litter.

## **Considerations for Packaging Nonambulatory Victims in Unstable Terrain**

- If the victim is in danger of falling, secure the victim to the main and belay/safety line with the victim harness and prusiks.
- Position the rescue litter below the victim in a horizontal, level position as if it is flat on the ground.
  - Secure the rescue litter in place against the rescuer's knees.
- Ease the victim onto the rescue litter and package as shown previously in this chapter.
- Once packaged, the rescue litter can be placed in a normal position for the raise.