

NEVADA COUNTY SHERIFF'S DEPARTMENT

# ROUGH TERRAIN MANUAL



January 22, 2012

## OVERVIEW OF ROUGH TERRAIN

This course is designed to establish a few of the basic skills you may need to extricate a subject, or fellow searcher, from rough, steep, slick or otherwise hazardous terrain. Typically you will be assisting other specialized teams; usually the ropes or mine team, but not always. The primary goal of any rescuer is to get the subject to safety as quickly and safely as medically possible.

### L.A.S.T.

#### **Locate-Assess-Stabilize-Transport**

**Locate-** Locate the subject.

**Assess-** Assess the physical and mental condition of the subject.

Also assess the terrain conditions, what resources will be needed to get the subject to safety.

**Stabilize-** Stabilize the subject. Medically and emotionally.

**Transport-** Transport the subject to safety.

The rough terrain personnel may be asked to help Stabilize and Transport the subject.

# Personal Equipment

Most of these items are in the required pack list, but deserve extra attention for rough terrain work.

**Gloves** - Well fitting leather gloves. Insulated if cold weather. Medical gloves, Nitrile is best

**Footwear** - Comfortable, durable, well fitting hiking boots with an aggressive tread.

**Tubular Webbing** - Determine the length you will need for a harness, minimum 20 feet.

**Prusik Loop** - Common lengths are 54 and 72 inches cut length. Adjust to suit.

**Goggles or Safety Glasses** - Required anytime around helicopters!

Durable, impact resistant, well fitting.

**Helmet** - Required anytime around helicopters! Rock climbing style acceptable. Team supplied if needed.

In addition to these, items like a headlamp and flashlight, knife, first aid kit etc should be carried at all times.

Notes:

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## Medical Assistance

If a subject or rescuer has been injured, has fallen or is unconscious, he/she must have a **MEDICAL ASSESSMENT before** moving him or her. If a subject sustains a **HEAD, NECK, or SPINE INJURY** **premature removal** can cause permanent paralysis or even death. Immediate removal is justified **ONLY** if there is **clear and present danger to life and health**; such as falling into a hole, over an edge or encroaching fire.

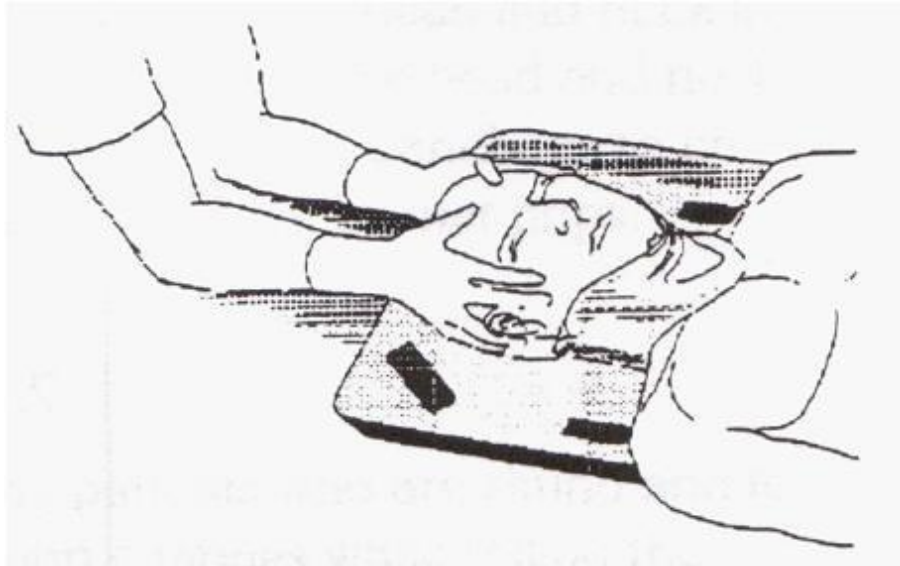
**DO NOT** move a trauma subject until a **MEDICAL ASSESSMENT** clears you to do so.

You may be called upon to assist an EMT – Nurse – PARAMEDIC – Doctor or other medical personnel. You may be asked to hold a subject's head (Head Stabilization is extremely important). Without it the subject could suffer further spinal injuries.

If you are holding a subject's head, **you must not move or release the head** until told to do so by the medical caregiver in charge.

Any unconscious subject or possible spinal injury subject will require a full backboard packaging procedure. We will not cover back boarding here, but you must none-the-less learn to **“HOLD THE HEAD”**.

# Head Stabilization



Keep head in a neutral position

Make sure subject is breathing

Nose aligned with navel

Do not bend head up or down

Tell subject NOT to move his/her head

Explain what you are doing

Once you stabilize manually (Hold the Head) you cannot let go until medical personnel tell you to do so.

Notes:

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# Subject Packaging

A full back board must be used if the subject is unconscious or there is ANY chance of a head, neck or spinal injury. Loading the patient onto the backboard will be directed by the medical personnel on scene.

## Log Roll



The log roll is a very effective technique for getting an injured person into the litter.

1. One rescuer holds head of subject
2. Two or three rescuers roll the subject towards them keeping subjects body in line.
3. Another two rescuers place litter against subjects back.
4. Subject is rolled back into litter and centered.  
**Always place blanket into litter before scooping subject.**

The subject must be secured into the litter so he/she does not move within it or fallout.

1. Always reassure the subject
2. Always address the subject by name
3. Check subject comfort
4. Pad under back, knees, etc. if necessary
5. Attach goggles to subject if necessary
6. Apply SPIDER STRAP ASSEMBLY
7. Protect subject's eyes from sun.

**Remember Subject Comfort!**

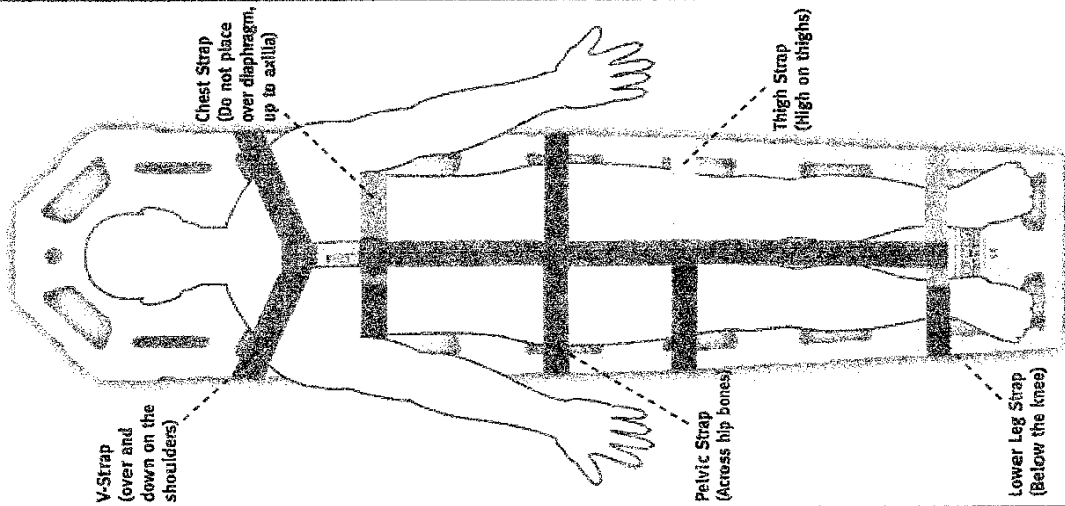
### **Spider Strap**

The spider strap is to be used to secure the subject into the litter whether or not a back board has been used.

1. Remove Spider Strap, litter blanket and foot loop webbing from bag.
2. Place litter blanket in litter or on ground next to subject if using blanket to lift subject into litter.
3. With subject in litter unroll Spider Strap starting from the subject's neck.
4. Attach Spider Strap to **SECOND** rail from the top starting from the subject's neck.
5. Working with a teammate or alone continue down subject until all straps are securely fastened.
6. Again remember subject comfort, ask if the straps are too tight, and add padding as necessary.
7. Use webbing to support subject from slipping down in the litter.

# SPIDER-STRAP™

Immobilization Strap



V-Strap  
(over and  
down on the  
shoulders)

Chest Strap  
(Do not place  
over diaphragm,  
up to axilla)

Pelvic Strap  
(Across hip bones)

Thigh Strap  
(High on thighs)

Lower Leg Strap  
(Below the knees)

For best results in the field,  
practice using the Spider-Strap™  
until you become thoroughly  
familiar with it.

## APPLICATION:

1. Hold folded strap above patient's chest with strap loops at bottom pointing to patient's feet.
2. Unfasten small retaining fastener which holds entire strapping system together.
3. Using both hands, divide the strap in the middle, letting it fall open naturally.
4. Place strap on patient's chest with the center strap folds pointing towards the patient's feet and the V-Strap on the patient's chest.
5. Pull the top cross strap (foot strap) towards the patient's feet. If it has been done correctly, you will see a solid color strap down the center of the patient. If you see any other colored straps crossing the center strap, that strap is inverted.
6. Unfasten the hook and loop on each cross strap and run through the holes in the backboard or scoop stretcher and then back around and fasten it to itself.

## REFOLDING:

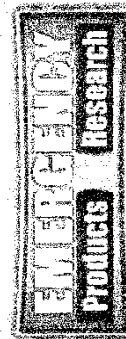
1. Lay strap out as if on patient.
2. Fold cross straps back on themselves. Secure with hook and loop.
3. Position yourself at the foot end of the strap and grasp the right and left sides of the foot strap.
4. Pick up cross straps in sequence, half in your right hand and half in your left hand, beginning with the bottom strap. Align the center strap folds toward you.
5. When entire strapping system has been picked up, fold in half and secure with the small hook and loop fastener located on the V-Strap.
6. Store near backboard or scoop stretcher until next use.

## CARE:

1. Keep hook and loop clean; the hook and loop closures will support considerable weight and "safe use" if kept clean and lint free.
2. Hand wash. For machine washing, put strap in a pillow case, use cool water and a mild detergent and the gentle cycle.

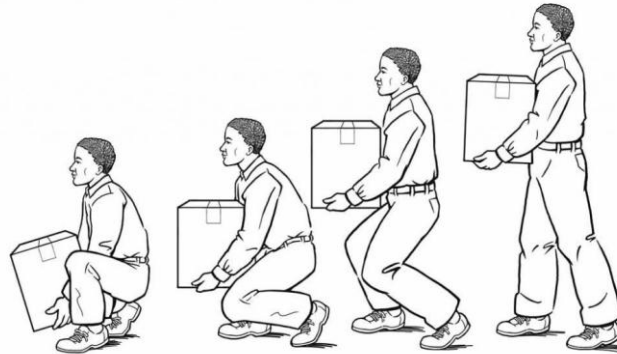
For Professional Use Only!

AIR DRY ONLY. DO NOT PUT  
IN DRYER. DO NOT AUTOCLAVE.





## **Lifting the Litter**



Proper lifting techniques are important not only for your safety but also for the subject's comfort.

1. Position feet properly
2. Never turn or twist
3. Keep back straight and locked when lifting
4. Keep weight close to your body
5. Grip with both hands firmly when lifting or lowering
6. Lift and lower smooth and steady with your legs.

## **Litter Handling**

Once the subject is secured into the litter, movement or transport may begin. This will take a number of rescuers.

### **Team Leader**

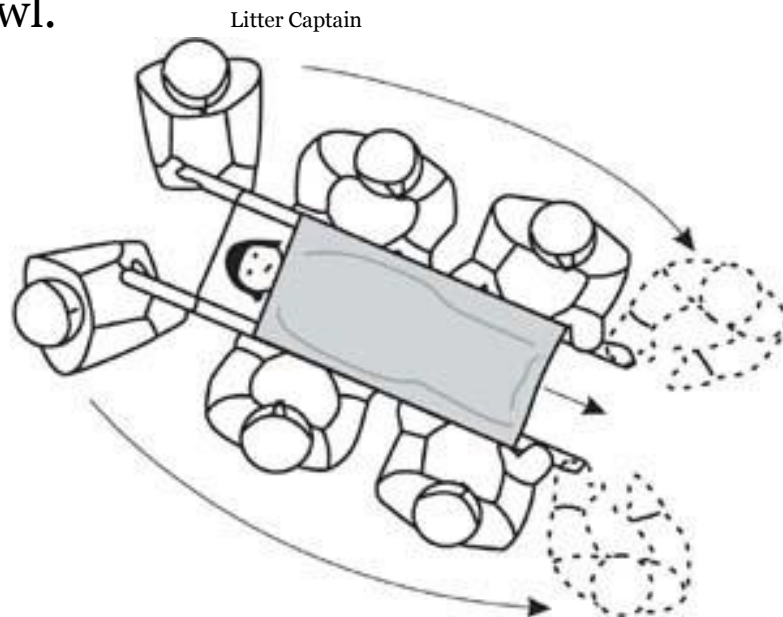
1. Select a team leader. Team leader will lead and control the transport.
2. Only the team leader will give commands
3. Select six litter tenders to carry litter – three per side

## Medical Officer

1. Chose someone independent of the litter tenders if you have enough personnel
2. Does not have to be an EMT, Nurse, etc.
3. The job is to keep a sharp eye on subject's status, comfort and reassurance. He/she can stop transport at anytime for subject's welfare.

## Litter Captain

1. Litter captain will manage litter movement, i.e., “stop” – “swing left” – “raise litter” – “lower litter” etc. He/she will watch for hazards, rocks, holes, etc., anything underfoot.
2. The **Right Front** litter position will always be the litter captain, even when personnel change positions during Caterpillar Pass or Turtle Crawl.



## Commands

The following language is standardized to limit confusion between Team Leader, Litter Captain and other rescuers. These commands are simple, common sense and easy to remember.

1. **STOP** All activities cease immediately  
**Can be called by anyone.**
2. **STANDBY** Wait attentively – be ready to resume immediately
3. **RAISE LITTER** Raise whole litter
4. **LOWER LITTER** Lower whole litter
5. **FORWARD LITTER** Move team and litter forward
6. **BACKUP LITTER** Move team and litter in reverse
7. **REVERSE DIRECTION** Swing litter around 180 degrees
8. **SWING LEFT** Go left around an obstacle
9. **SWING RIGHT** Go right around an obstacle
10. **TURN LEFT** 90 turn left
11. **TURN RIGHT** 90 turn right
12. **RAISE HEAD** Raise head end of litter
13. **LOWER HEAD** Only when necessary to complete mission
14. **RAISE FEET** Raise foot end of litter
15. **LOWER FEET** Lower foot end of litter

Generally the head end of the litter will always be kept higher than the foot end.

## **Flag Route**

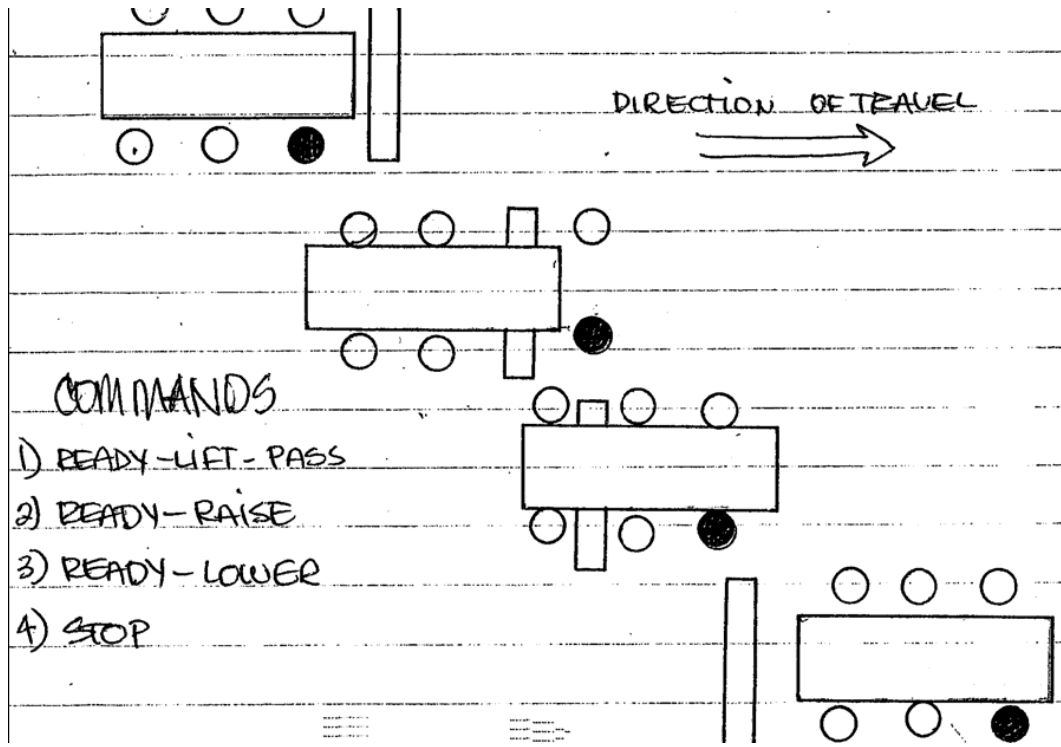
It may be necessary to flag the route out of the area.  
(Extrication Route)

1. Team Leader will either lead the way out of difficult terrain or designate someone to do so.
  - a. He/she may use memory or GPS.
  - b. May attach flagging tape to bushes, trees, rocks, etc.
  - c. Flagging should be clearly visible.
  - d. Must maintain radio contact at all times. Litter Captain will turn his/her radio on at this time if necessary.
2. Remember
  - a. Only one rescuer gives commands except Stop.
  - b. Litter Captain and/or Team Leader should maintain visual or radio contact at all times.

## **Special Circumstances**

### **Caterpillar Pass**

The Caterpillar pass is a method of organizing the rough terrain team to move the subject and litter through or over an obstacle such as log, culvert, etc. or under something.



When approaching an obstacle the Litter Tenders will rotate positions from front to rear while moving under, over or past an obstacle. The right front tender will become the Litter Captain, the only one to give commands except Stop.

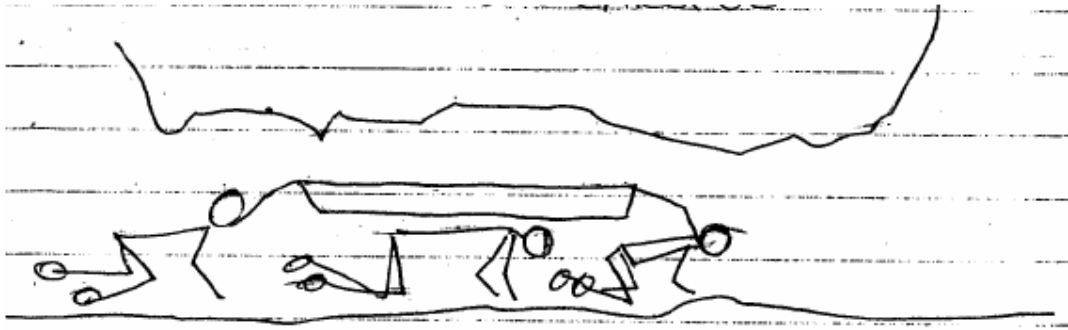
### Litter Wheel

1. The litter wheel can be attached to the bottom of the litter when the terrain is flat and smooth.
2. The litter should be raised by at least four people while the wheel is being attached or removed.
3. Always use at least four rescuers to move the litter if terrain allows.

A wheeled litter does not balance well so BE Careful!!!

## Turtle Crawl

1. The turtle crawl can be used to move a litter under an obstacle or through a narrow passage.
2. You may need knee pads and or elbow pads.
3. You may need something to pad rescuers back and shoulders such as a jacket, t-shirt, blanket, etc.



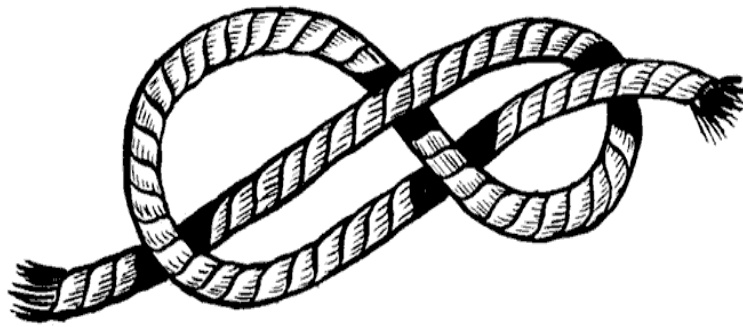
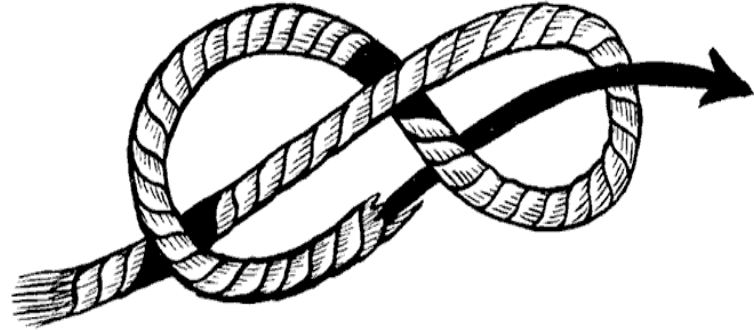
In some instances the litter may need to be lifted or lowered using ropes. In these cases the rope or mine team will take over the extraction. You may be asked to assist them.

## Knots

The following pages give examples of how to tie the basic knots needed for the rough terrain training. Working with ropes is a very tactile experience; please take some time to get used to the feel of the rope.

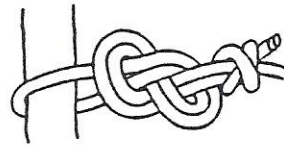
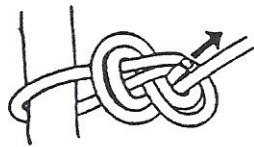
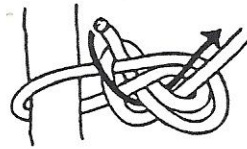
**Figure 8**

Used to tie other knots and as a stopper



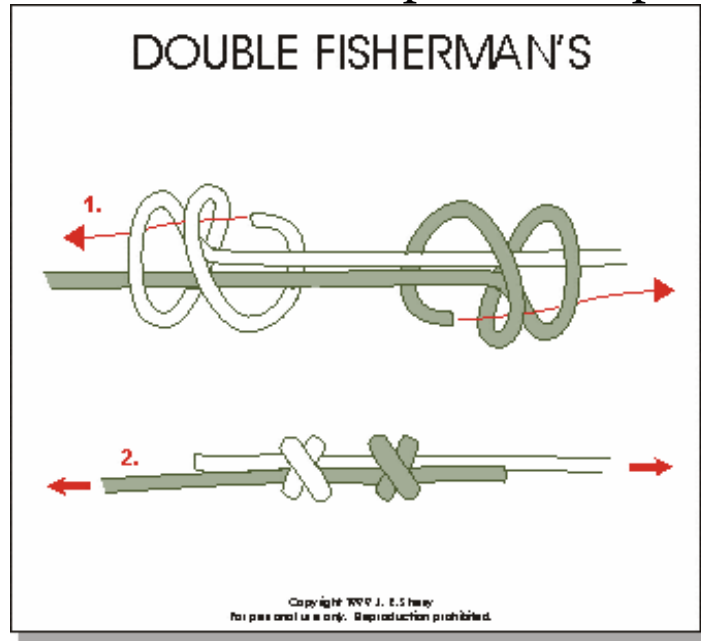
**Figure 8 follow through**

Used to secure the rope to an object



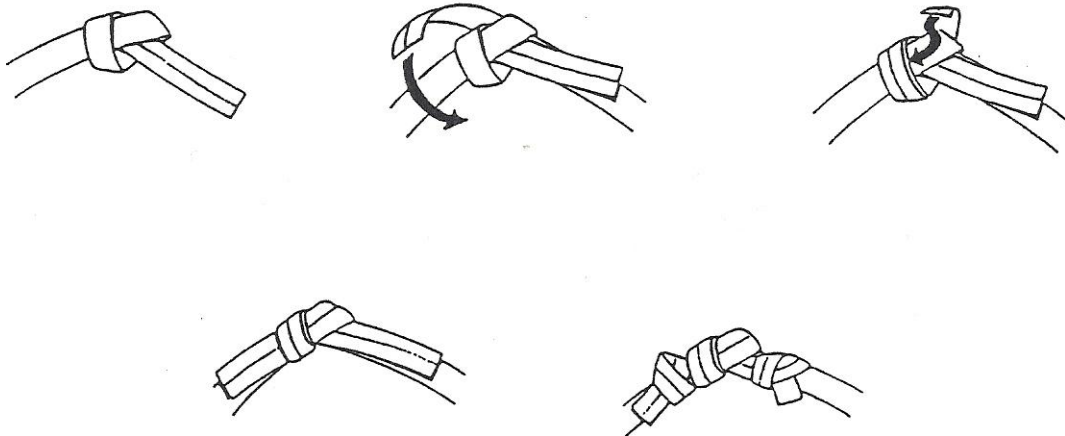
# Double Fisherman

Used to make a prussic loop



# Water Knot

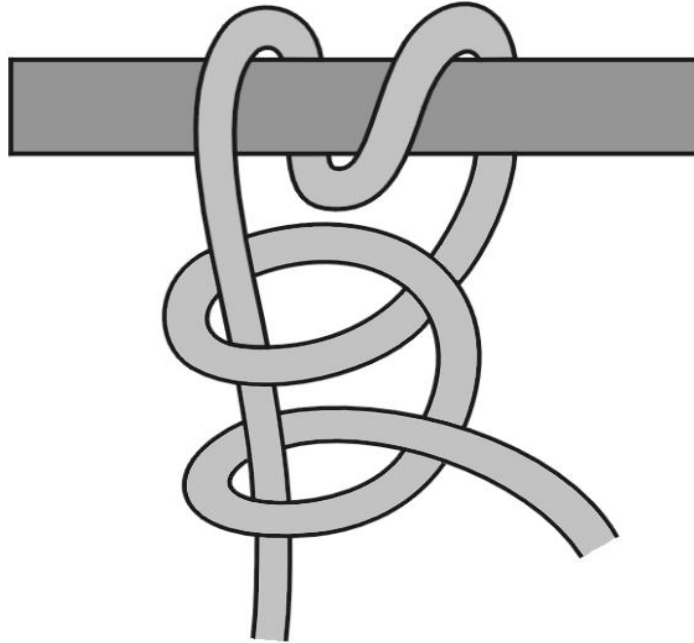
Used to tie ends of webbing together





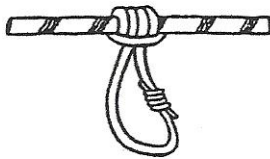
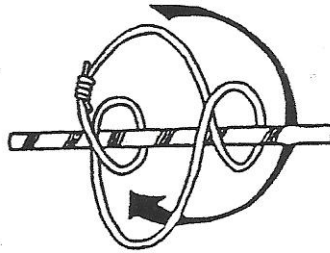
## Round Turn Two Half Hitches

Used to secure the webbing foot strap on the litter.

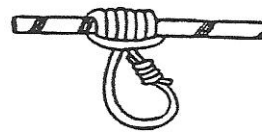


## Prusik Hitch

A friction knot.



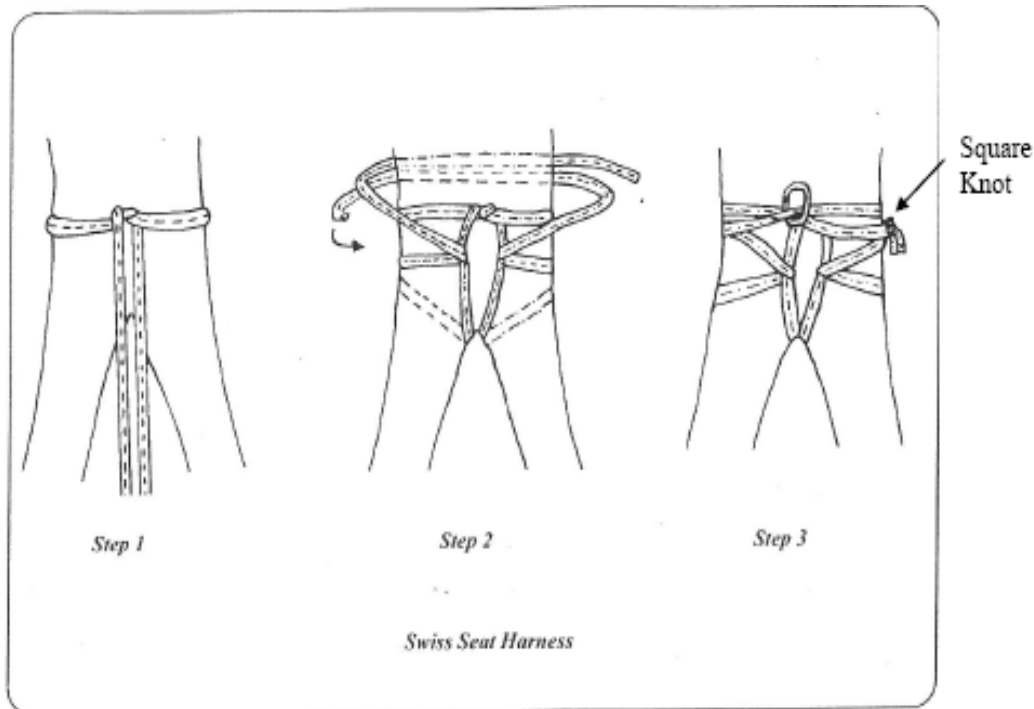
**TWO WRAP PRUSIK**



**THREE WRAP PRUSIK**

## **Swiss Harness**

Used to secure you to the rope.



The standardized use of one webbing harness is an important safety measure. The golden rule in any rough terrain situation is the buddy check. If your buddy is unfamiliar with your harness it is impossible for him or her to tell if it is safe or not.

## **Slope Handling Skills**

Occasionally you will need a rope to access a subject or even a search area. This basic knowledge will allow you to do this safely and efficiently.

## Commands

These simple commands will allow you to communicate your actions and to the belayer.

1. **Stop** Cease all activity immediately
2. **Standby** Wait attentively – ready to resume immediately
3. **Tension Belay** Take slack out of rope
4. **Slack belay** pay out slack in rope
5. **Off Rope** When rope is no longer necessary and rope has been detached from litter

The belayer will respond to all commands with “thank you” to acknowledge he understands.

## Proper Clothing

1. Gloves
2. Boots
3. Eye Protection
4. Helmet-If needed
5. Harness

## Rappel Basics

1. Buddy check.
2. Wrap Prusik hitch.
3. Clip Prusik onto harness with carabineer.
4. Approach edge with approval from edge tender.
5. Guide hand at hip, other on Prusik wrap.
6. Feet approximately shoulder width apart.
7. Step back let the Prusik slip on the rope.
8. Descend, the Prusik will catch if you slip.

