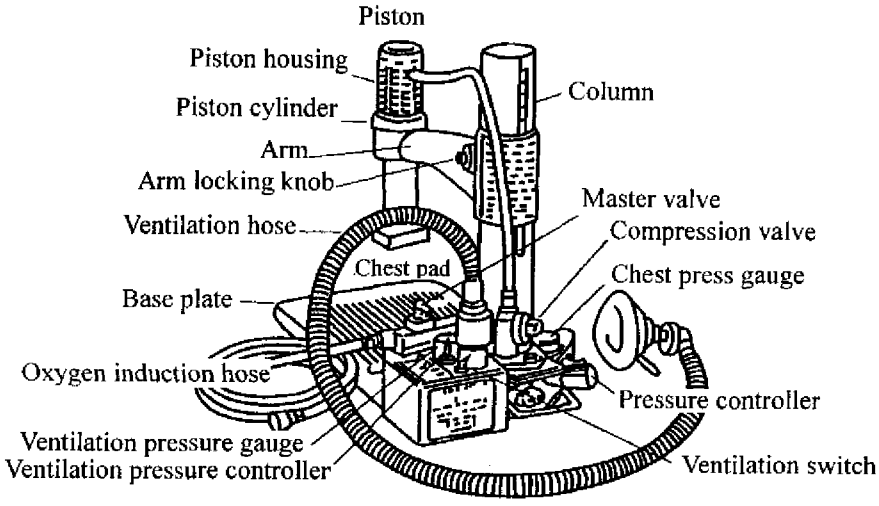


Fig. 3-2-39 Names of the components of the automatic chest massage machine

This technique requires proper training. To the untrained, it may be unavoidable that your fingers touch the victim's chest wall but nevertheless you must not press strongly with them.

To press the breast bone vertically using the weight of your upper body, position your shoulder directly above the chest of the victim and press the backbone of the victim with both arms straight. If you can straddle the victim, it is easy for you to position your shoulders directly above the victim's chest. However, if the victim is on a bed, it is very difficult. Therefore, in such a case, it is recommended you use a stool.

Press the breast bone of the victim down (using both hands) by 3.5 to 5cm for an adult. Press the breast bone of the victim down by 1/3 of the breast thickness for child under 8 years old, infant or newborn baby. For victims of any age, apply sufficient force so that the peripheral artery is felt.

After pressing down the victim's chest to its maximum depth, keep your palm on the chest but press no further. Pressing and non-pressing intervals must be equal. Press about 100 times per minute for adult or infant victims, or about 120 times per minute for newborn baby victims.

3) Instructions for using the automatic chest massage machine (Fig. 3-2-39)

The automatic chest massage machine is a cardiopulmonary resuscitation device operated using oxygen as its power source instead of electricity. It is useful for continuing CPR when there are insufficient first-aiders to take over and relieve, when one gets tired, or in a confined space such as inside an ambulance car or an elevator.

To operate the machine, you should lay the victim on their back, and then put the cardiopulmonary resuscitation plate under their back, securing the plate with the belt. Join the base of the piston to the plate on the back of the victim, and adjust the arm so that the piston reaches a position suitable for massage over the breast bone of the victim. Then secure the unit with the locking knob (See Photo. 5-2-19 on Page 272). With the piston set in the lower position, switch "ON" the master valve and compression valve. If you perform artificial respiration with the machine at the same time, seal the oxygen mask closely over the mouth and nose of the victim and switch "ON" the ventilation switch.

4) Precautions for CPR

When performing chest massage, it is essential to make the victim lie on a hard surface such as the floor. It is impossible to perform effective CPR on a victim who is lying on a soft surface such as a bed mattress. In addition, rib fractures, breast bone fractures, and damage to lungs, heart, liver and/or stomach may occur after CPR so extreme care should be exercised to prevent these complications. As a rule, cardiac massage should not be interrupted for longer than 5 seconds. However, an interruption up to 30 seconds is generally allowed when transferring a victim up or down stairs or when inserting endotracheal intubation.

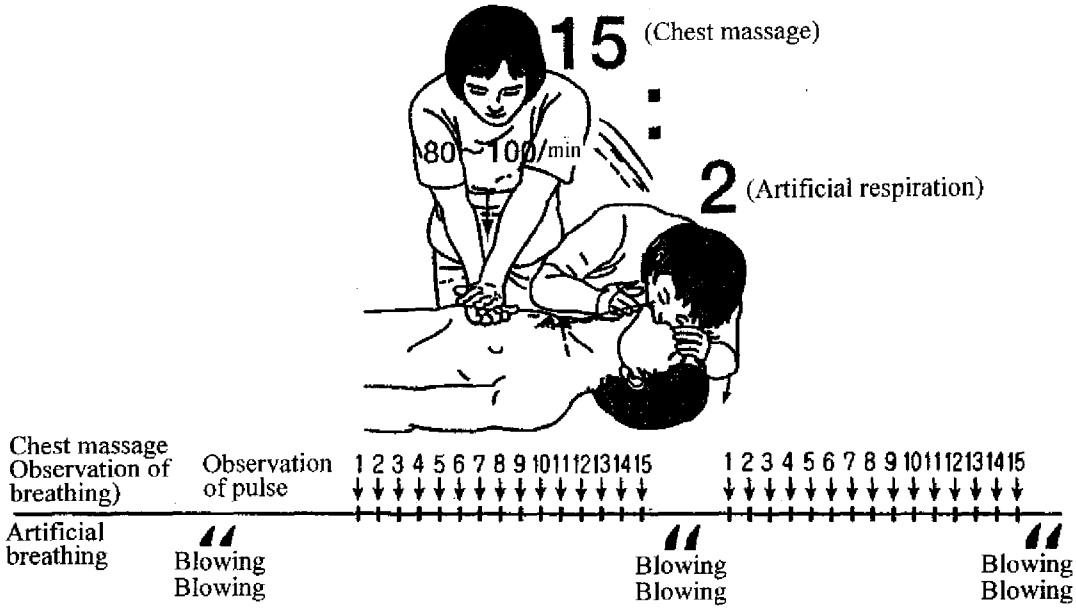


Fig. 3-2-40 Cardiopulmonary resuscitation

6. Cardiopulmonary resuscitation

If the victim stopped functioning or suffers a serious malfunction in breathing or circulation, it is impossible to maintain the life of the victim or resuscitate the victim unless you make up for the lost or deteriorated function by any means. Cardiopulmonary resuscitation (CPR) is a means to maintain the life of the victim, which is a combination of artificial respiration and chest massage. CPR is classified into two types; the primary life support treatment (basic life support; BLS) which can be performed without using any medical equipment or medicine by first aiders who are not physicians, and the secondary life support treatment (advanced life support; ALS) which is performed by physicians or ambulance crew paramedics using medical equipment and/or medicines.

1) Conditions where cardiopulmonary resuscitation is required

Cardiopulmonary resuscitation is required when the condition of a patient deteriorates to stop breathing or circulation due to one or some of various intrinsic or extrinsic diseases.

2) Procedure of cardiopulmonary resuscitation for adult patients (Fig. 3-2-40, Table 3-2-7)

Give your breath 2 times to inflate the victim's lungs. Give chest massage 15 times (at a speed of 100 counts per minute) and again give your breath twice. Repeat this 15:2 procedure.

Table 3-2-7 Procedures of cardiopulmonary resuscitation to be performed by ordinary people for adult patients

1. Securing open airway

If you find a person lying unconscious, determine the consciousness by tapping the victim and asking loudly "Are you OK?". If he or she is unconscious, immediately attempt to secure the open airway while asking some other people to make a 119 call.

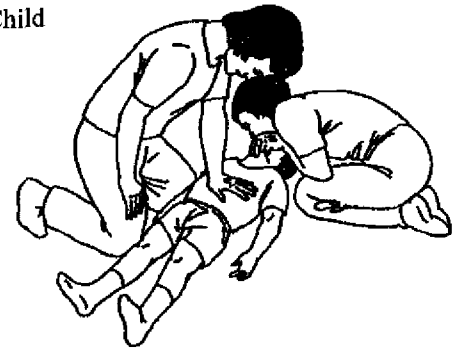
2. Artificial respiration

Check the chest movement, listen and feel the breaths of the victim and judge the respiration condition within 10 seconds.
If the respiration restores while the victim is unconscious, position him or her in recovery position to prevent obstruction of the airway.
If no respiration is restored despite the maintenance of open airway, give your breath twice of an amount calculated multiplying the weight (number of kilograms) of the victim by 10 ml (per 1 kg) in 2 seconds.

3. Chest massage

After giving artificial respiration twice, check the sign of circulation (respiration, cough, physical movement) within 10 seconds after that.
If the sign of circulation is felt, continue artificial respiration at a cycle of once per 5 seconds if the patient is an adult.
If no sign of circulation is felt, start chest massage in addition to artificial respiration following the procedure below:
Perform chest massage and artificial respiration at a rate of 15:2. Chest massage should be performed at a speed of 100 counts per minute and to the extent that the breast bone is pressed down by 3.5 to 5cm.
* The medical staff should also check the pulse.

a) Child



b) Infant

Fig. 3-2-41 Cardiopulmonary resuscitation for infant or child patients

3) Procedure of cardiopulmonary resuscitation for infant and child patients (Fig. 3-2-41, Table 3-2-8)

If the victim is an infant or child, perform chest massage and artificial respiration at a rate of 5:1 regardless of the number of first aiders.

Table 3-2-8 Procedures of cardiopulmonary resuscitation to be performed by ordinary people for infant or child patients

1. Securing open airway

If you find an infant or child lying unconscious, determine the consciousness by tapping the victim and asking loudly "Are you OK?". If he or she is unconscious, immediately attempt to secure the open airway while asking some other people to make a 119 call.

2. Artificial respiration

Check the chest movement, listen and feel the breaths of the victim and judge the respiration condition within 10 seconds.
If the respiration restores while the victim is unconscious, recovery position him or her in coma position to prevent obstruction of the airway.
Give your breath twice to the extent that the victim's chest slightly rises. Take 1 to 1.5 seconds per breath. (1 second for a newborn baby)

3. Chest massage

After giving artificial respiration twice, check the sign of circulation (respiration, cough, physical movement) within 10 seconds after that.
If the sign of circulation is felt, continue artificial respiration at a cycle of once per 3 seconds. (once per 1 to 2 seconds for a newborn baby)
If no sign of circulation is felt, start chest massage in addition to artificial respiration following the procedure below:
Regardless of the number of first aiders, perform chest massage and artificial respiration at a rate of 5:1(3:1 for a newborn baby).Chest massage should be performed at a speed of 100 counts per minute for child patients, or at the speed of 100 counts per minute at least for baby patients. (120 counts per minute for a newborn baby) Press the breast to the extent that the breast bone is pressed down by 1/3 of the breast thickness of the patient.
* The medical staff should also check the pulse.

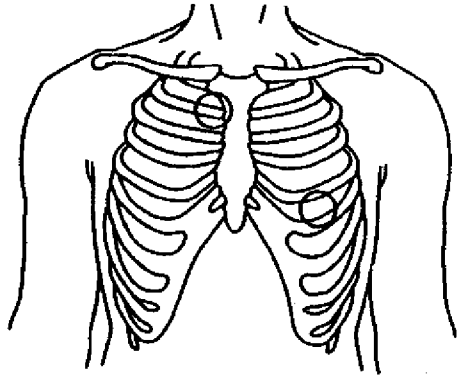


Fig. 3-2-42 Positions of electrodes for defibrillation

4) Defibrillation (Fig. 3-2-42)

Defibrillation is the most effective means of resuscitation in case of ventricular fibrillation (VF) or pulseless ventricular tachyarrhythmia (VT). It is permitted for the ambulance crew paramedics to perform defibrillation using the automatic external defibrillator as comprehensive instructions.

5) Precautions of cardiopulmonary resuscitator

Once you start cardiopulmonary resuscitation, it should not be discontinued until the victim restores the respiration or pulse or accepted by a medical facility. While performing cardiopulmonary resuscitation, carefully observe the face color, pupil, movement of victim's body, condition of victim's spontaneous breathing and pulse to make sure that the Cardiopulmonary resuscitation (CPR) is correctly performed and evaluate the restoration of respiration and cardiac pulsation. Be sure to check if the CPR had an effect in one minute after you started the CPR. After that, check it once in every a few minutes.

7. Stop bleeding

1) Bleeding to be treated by first aid procedures

Bleeding in the body cavity such as the skull, thoracic cavity, abdominal cavity is not to be treated by first aid procedures. Bleeding per rectum, vaginal bleeding, and so on are seldom treated by first aid procedures. First aid procedures to stop bleeding can be applied in most cases for external bleeding from an open wound on condition that the victim can bear pressure having bone tissues in the head, face, four limbs.

2) Direct Pressure (Fig. 3-2-43)

Apply direct pressure by placing the fingers, or by placing the bandage, over the area of an open wound. This method is the basics for stoppage of bleeding. It is possible to stop almost all types of bleedings such as a slight bleeding from artery, a bleeding from vein, a bleeding from capillary vessel with this method. In case of a bleeding from artery in the head, face,

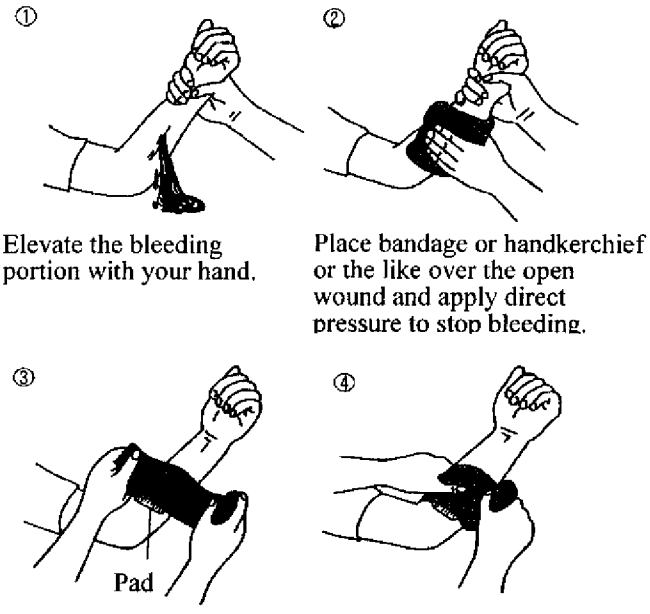


Fig. 3-2-43 Stoppage of bleeding by direct pressure

upper arm, thigh, fingers, etc , bleeding can be effectively stopped by applying inward force over an open wound. In performing the direct pressure method, keep the bleeding portion higher than the victim's heart in order to effectively stop bleeding. After bleeding is stopped by the direct pressure method, put a dressing over the bandage and apply a slight pressure on the dressing.

3) Indirect pressure

In case of bleeding from the artery in the forearm or the leg, you can not apply direct pressure because the artery runs below and between two bones (the radius and ulna in the forearm; the tibia and fibula in the leg). In this case, bleeding can be stopped by applying inward force on the artery toward the bone over an open wound. This method is called the "bleeding control by indirect pressure". The portion where pressure is applied is called the "portions for bleeding control" (Fig. 3-2-44). This method is useful to control bleeding from artery without circulation disturbance in the peripheral blood vessels. However, you can't stop bleeding effectively unless you press on the right position over the artery. Care must be exercised not to mistakenly apply pressure on the peripheral blood vessels to prevent circulation disturbance.

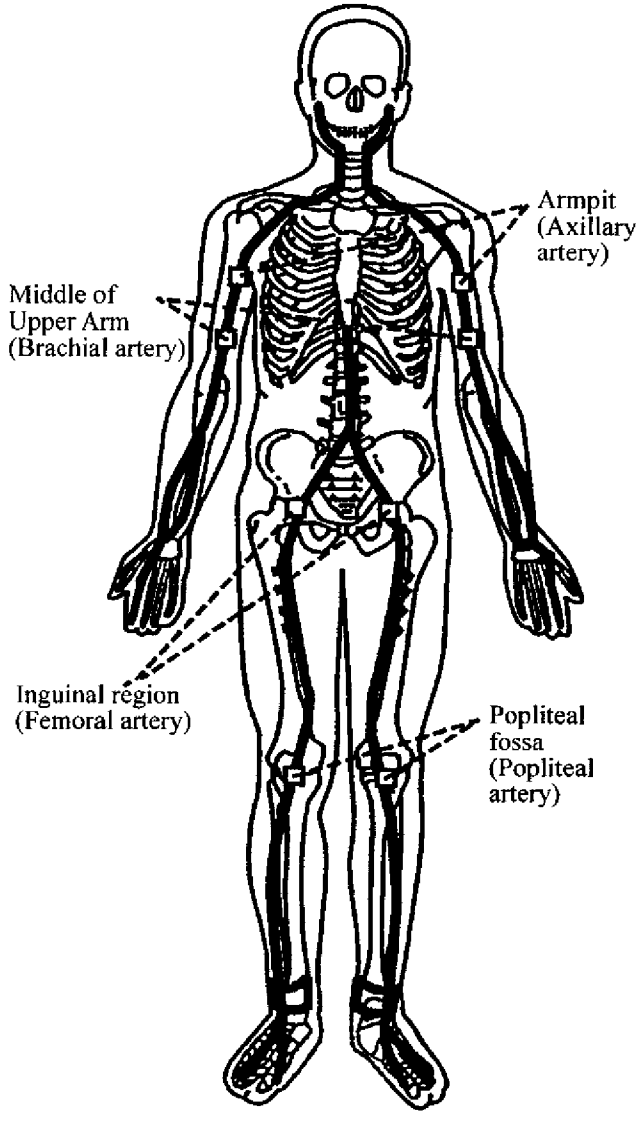


Fig. 3-2-44 Portions for bleeding control

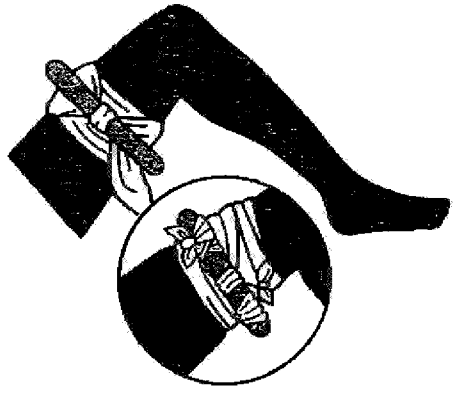


Fig. 3-2-45 Tourniquet band (in case of the thigh)

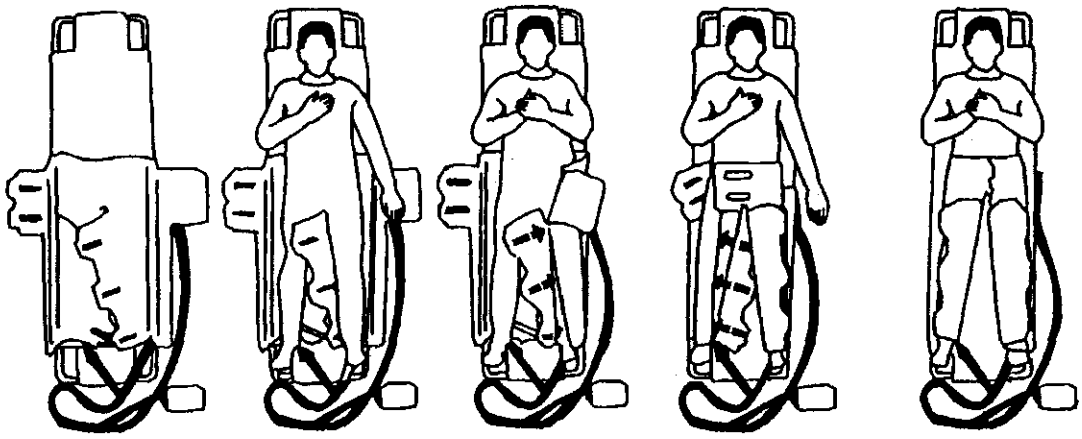


Fig. 3-2-46 Procedure of putting on the shock pants

4) Tourniquet band

This method is used only when the direct or indirect pressure method can not be applied to stop bleeding caused by damage to artery in the upper arm, forearm, thigh or lower thigh. Fig. 3-2-45 shows the method of tourniquet band. You can effectively stop bleeding with this method, but you must be careful in using this method knowing that it completely blocks the peripheral nerves around the wound and cause necrosis with the passage of time. When you presume that it would take more than 30 minutes to reach a medical facility, loosen the tourniquet band once in every 30 minutes to resume blood circulation for prevention of damage to muscular tissues. (Blood circulation blocking time must be within one hour at the longest.) Resume blood circulation and block it again in 1 to 2 minutes when the skin of portions on the limb after the tourniquet band becomes flushed and blood comes oozing through the bandage over the wound. During blood is recirculating, it is also necessary to restrain blood from coming out by directly pressing the portion over the wound.

5) Shock pants (MAST) (Fig. 3-2-46)

The MAST (medical anti-shock trousers) is a pair of trousers to cover a patient's abdomen through both lower legs overall, the outside of which can be tied up with a hook and loop closure or a zipper. (See Photo 5-2-21, Page 273) There are independent three chambers for the both lower legs and the abdomen respectively. By increasing air pressure in these chambers, it is possible to control bleeding as the tissue pressure around the vessels increases as well as to increase the resistance of the peripheral vessels and decrease the compartment volume in the lower half of the body as the internal diameter of the vessel decreases. This method is performed based on the theory that the pressure increase causes blood shift to other portions of the body and the blood pressure rises as the preload increases which improves cerebral and coronary circulations.

The MAST is suitable in case of diseases such as:

(1) Massive bleeding in the abdominal cavity due to damage of the liver, spleen or vessels, or tubal rupture (extrauterine pregnancy).

(2) Massive retroperitoneal bleeding due to severe pelvic fracture

(3) Ruptured abdominal aneurysm

If the patient shows a sign of shock disease while his or her maximal blood pressure is less than 80mmHg, you must consider application of the MAST.

Apply pressure in respective chambers of the MAST, first for one of two lower legs and second for the other lower leg, and finally for the abdomen. At first, set the pressure at 40mmHg and observe the change of blood pressure. If no signs of improving, increase the pressure step by step at each level of 60 → 80 → 100mmHg. Do not apply pressure of over 100mmHg. It is a taboo to use the MAST for treatment of the cerebrovascular disease, severe head injury, chest injury complications, congestive heart failure, etc. as using the MAT will deteriorate the condition of those diseases. After putting on the MAST, it is necessary to carefully observe the patient. The patient may vomit as the abdomen is suppressed or his or her breathing may be restrained as the diaphragm is elevated.

Table 3-2-9 Bandage variations

Roller bandage	A certain width of bandage made by cutting a long and 30cm-wide bleached cloth into 2 equal parts is called the 2-divided bandage. When the 30cm-wide cloth is divided into 3 equal parts, the bandage is called the 3-divided bandage. Following are the bandage variations for selections for respective portions of the body 2 - 3 divided: Chest, Back 4 - 6 divided. Head, Limbs 7 -8 divided: Fingers, Digiti pedis
Triangular bandage	The triangular bandage is made by cutting about 1 ㎡ square of cotton cloth into two triangle cloths. This type of bandage is useful for first aid procedures such as dressing on the victim's head, chest, shoulder, etc. where it is difficult to dress with the roller bandage, or such as covering the victim's hand or leg, or hanging up the victim's forearm winding around his or her neck in order to support the upper arm.
Elastic bandage	The elastic bandage is a special type of roller bandage which is made of elastic fibers or made using rubber materials. This bandage is easy to fix over the wound making it easy for even inexperienced people. However, care should be exercised not to wind the elastic bandage over the wound with too much tension. Too much tension may cause the victim to suffer from blood circulatory disorder as the elastic bandage tighten up later.
Elastic adaptic dressing: (PRESNET®)	The elastic adaptic dressing is a netted bandage, which is used to quickly dress the victim's head, fingers, limbs, etc. This bandage also gives a slight compression effect.

Once you put on the MAST and apply pressure, even if the patient's blood pressure rises and his or her condition is improved, you should never stop applying pressure until the patient is brought into a medical facility and a doctor starts treatment. If you stop applying pressure abruptly, the patient may suffer from a serious shock disease or a cardiac standstill.

6) Precautions of procedures to stop bleeding

It is essential to fully understand the advantage and disadvantage as well as precautions of procedures to stop bleeding. Procedures to stop bleeding are to save a victim's life. On the other hand, however, there is a danger of causing the peripheral tissues to suffer a serious burden such as ischemia or necrosis. Therefore, it is essential to observe vital signs over time and check if any peripheral circulatory disturbance.

8. Dressing and bandage

1) Conditions of a victim where the procedures of dressing and bandage are necessary

There is a danger of bleeding or infection when a victim suffers external or burn injuries such as puncture, incised, abraded, contused, lacerated, chop, mutilating, crushed, skin abrasion wounds, etc Therefore, it is necessary to put bandage on and/or dress those kinds of wounds.

Dressing refers to the procedure to cover an open wound with various materials to prevent infection and to prevent the wound. It should be the rule to use sterilized materials in dressing an open wound. Bandage refers to a material used immobilize, support and protect the injured part of the body as well as to hold a wound dressing.

2) Materials for dressings

(1) Sterile gauze

Sterile gauze are used for most of the wounds.

(2) Sterile towels

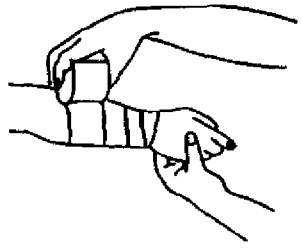
Sterile towels are used for a wide wound or burn. Sheet made of aluminum foil can be used for a wide range of burn. To first cover the wound by sterile towel and then cover with aluminum foil sheet is effective to keep the victim warm.

If gauze cannot absorb the blood from severe hemorrhage, first place gauze over the wound an then cover it with vinyl sheet or thick cloth. The gauze and vinyl sheet must be fixed with a tape so that it does not dislocate or come off.

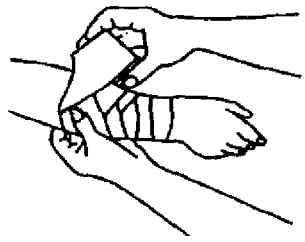
3) Dressing methods

In case of a wound or burn, you should apply a pretty thick dressing material which is rather larger than the area of the wound or burn. Application of dressing materials is effective to stop bleeding by its pressure, to absorb blood or secretion, to maintain hygiene of the wound, to alleviate a pain, and so on. If the victim is heavily bleeding, you should control the bleeding by compressing with your hand on the dressing material for about 5 minutes.

Before dressing a wound, the injured part should be washed and disinfected, the foreign substances in it should be removed, and the proper measure should be taken to control the bleeding.



Spiral dressing (Spiral bandage)



Recurrent dressing (Recurrent bandage)

Fixation dressing (Wandering bandage)

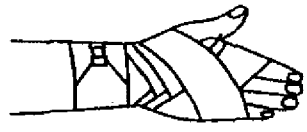
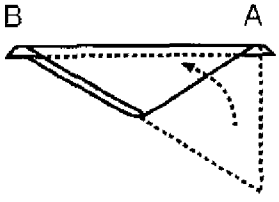


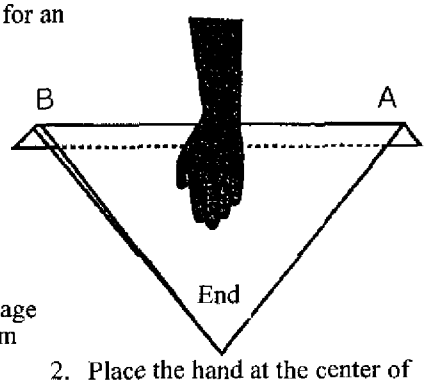
Figure-of-eight dressing (Figure-of-eight bandage)

Fig. 3-2-47 Bandage application variations

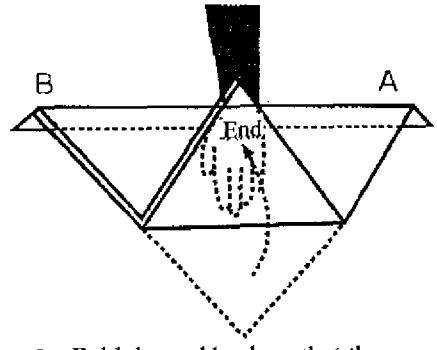
Bandage for injury of hand
This method can also be used for an open wound of extremities.



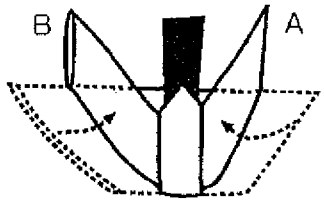
1. Prepare a triangular bandage Fold a hem about 3 to 5cm wide along the base.



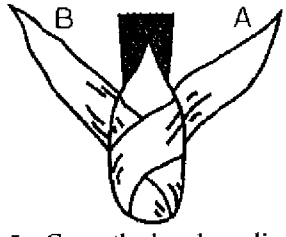
2. Place the hand at the center of the triangular bandage so that the fingers face to the end.



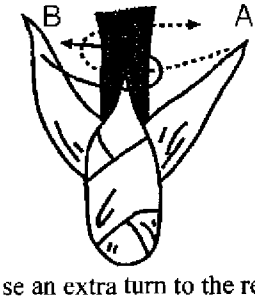
3. Fold the end back so that the hand is covered.



4. Fold the both sides along the sides of the hand so that the bandage properly fit the hand.

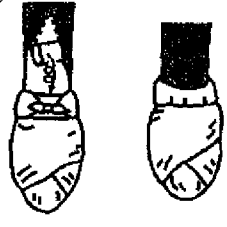


5. Carry the bandage diagonally upward across the front of the hand, then around the wrist.



6. Use an extra turn to the rear of the wrist.

7. Tie off both ends on the hand.



8. Fold the edge and push it under the bandage.

Fig. 3-2-48 Dressing method by application of a triangular bandage

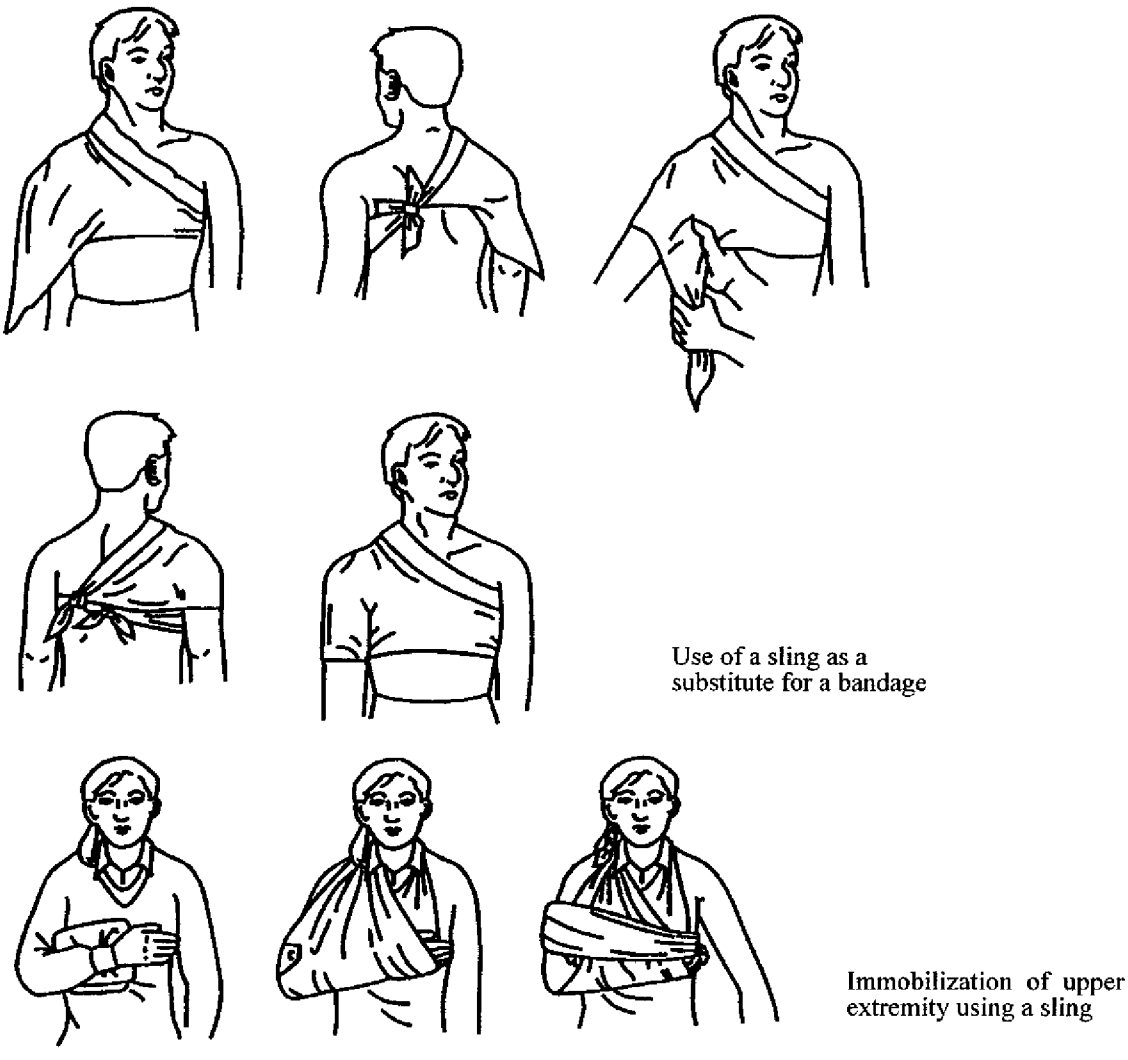


Fig. 3-2-49 Triangular bandage application

4) Bandage variations (Table 3-2-9)

Commercially available types of bandages are the roller, stretch, elastic, and netted bandages and the triangular bandage. (See Page 274 - 275)

Generally, a bandage should be applied in a manner so that a discomfort or movement restriction of the injured is minimized What is necessary for a first aider is to securely hold the dressing or splint and to stop by a compression. Therefore, the complex techniques such as Spiral, Recurrent, Fig-of-eight and Fixing bandages are not always necessary. Use of elastic bandage for quicker application is effective to facilitate prompt transfer to a medical facility.

5) Bandage application methods (Fig. 3-2-47, 48)

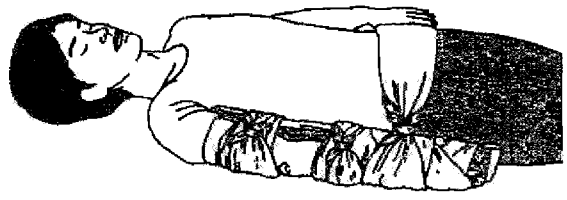
A bandage is useless if it is too loose, whereas it causes interference with circulation and result in homeostasis or ischemia if it is too tight. A bandage should be applied with a proper force. If blood penetrates a bandage, put gauge over the bandage and apply another bandage comparatively tightly to control the bleeding.

Usually a bandage can be held in place with a tape. When a triangular bandage is used, it must be tied. At this time, the knot must not be on the injured part of the body.

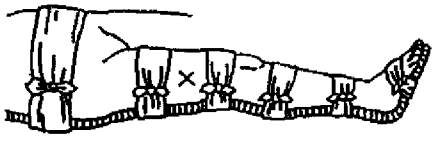
6) Triangular bandage application (Fig. 3-2-49)

A triangular bandage is applicable to various kinds of injuries or burns in every part of the body, so widely used as material for dressing or bandage application as well as for immobilizing a splint or hanging the victim's hand or arm.

Fracture of Humerus
(a plate and a sling)

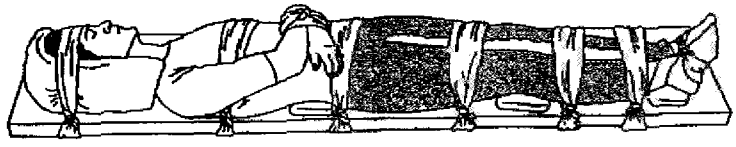


Fracture of Forearm bone (a plate)



Fracture of Thighbone
(Ladder-shaped sprint)

Fracture of Lower thigh bone
(Ladder-shaped sprint)



Fracture of Backbone
(Backboard)

Fig. 3-2-50 Splinting

7) Precautions when applying a dressing or bandage

Sterile, absorbent gauze is the best material to use as a dressing. However, if sterile, absorbent gauge is unavailable, a piece of clean cloth, handkerchief, bed-sheet or similar linen can be used as a dressing. A roll bandage, can also be applied successfully by wrapping it around the wound.

9. Splinting

1) Conditions where splinting are necessary

Splints are needed to support a fracture, dislocation, sprain, ligament, etc

A splint is applied to an injured limb when a bone fracture is found or suspected. Splints decrease pain and prevent secondary injury caused when broken bone ends move

2) Types of splints

(1) Ladder-shaped splint (See Photo 5-3-6)

A ladder-shaped splint consists of ladder-shaped metal wire, cotton or sponge and bandage. This splint is suitable to immobilize the fracture of extremities since it can be freely deformed

(2) Negative pressure splint (See Photo 5-3-7)

A negative pressure splint is called a magic splint. This splint has beads in a pat made of vinyl resin. Once the air inside the pat is drawn out, the pad becomes hard to form a splint. This splint can be bent to fit to the curves of body part and is used for fracture of neck, shoulder, back bone, and pelvis where a ladder-shaped splint cannot fit properly.

(3) Backboard and Litter for victims with a spinal injury (Scoop stretcher) (See Photo 5-3-8)

These devices are useful to immobilize and transfer a victim with an injury to their spine or spinal cord.

(4) Others

Newspapers, magazines, boards, sticks, canes, umbrellas can be utilized as splints. Sometimes a part of the victim's body is used as a splint.

3) Application of splints (Fig. 3-2-50)

The type and size of a splint should be selected according to the purpose and the condition of the injured part. For a fracture of extremity, a splint which can cover the central side of the part at which a fracture is suspected and the joint on the peripheral side is generally used. If the injured extremity is abnormally bent or shortened, it is desirable to pull the injured part before applying a splint. However, when a first aider applies a splint in an emergency, the injured part should not be moved as far as possible but simply be immobilized.

(1) Immobilization by a ladder-shaped splint

A ladder-shaped splint is used to immobilize extremity fracture. A ladder-shaped splint should be applied to one side or both sides of the injured extremity by selecting a part with open wound. The splint should be fit to the curve of the extremity and held by a folded sling or elastic bandage.

(2) Immobilization by negative pressure splint

This splint is suitable for the immobilization of fracture of neck, waist or pelvis. A pat size should be determined according to the injured part. Properly fit the beads in the pad to the injured part and remove the internal air to harden the pat.

(3) Immobilization by a backboard

A backboard has an advantage that first aiders can immobilize the backbone of the victim fixing on the backboard, and place this backboard on a litter to transfer the victim. If a fracture of backbone is suspected, before placing the victim on this litter, secure him or her with a neck collar and place pillows on the both sides of him or her. Sometimes first aiders place this backboard on a litter to transfer the victim.

4) Precautions for application of splints

If a victim has any life-threatening symptom other than a fracture, the treatment to save his or her life must be first given by putting off the applications of a splint.

Immobilize the injured part whenever a fracture is suspected. As a general rule, immobilization should be completed before starting transportation of the victim.

If an open wound in found at the fracture portion, a splint must be applied after proper treatment of the open wound such as disinfecting, bleeding control and dressing.

A splint should be properly padded between the splint and the skin to improve the effectiveness of the immobilization. Do not forcibly correct any fractured, deformed or shortened part of the patient's body.

After immobilization by a splint, watch for any symptom indicating interference with circulation. Loosen the bandage immediately if a cyanoses or coldness is found.

10. Warming

Warming is a procedure to warm the body of a victim if he or she feels cold and have chill or ague due to coldness, pain, blood pressure drop, body temperature drop or before feverscence.

1) Conditions and symptoms requiring warming

(1) Body temperature drop

Drowning or accidental hypothermia, etc.

(2) Before having fever

People often feel cold and shivering before having fever.

(3) Shock

A victim in hemorrhagic or psychogenic shock or the like may develop various symptoms such as cold extremities and shivering. Shivering will accelerate the oxygen consumption of body. Since the oxygen supply in a victim in shock decreases, acceleration of oxygen consumption must be prevented by warming the victim.

A victim who develops cyanoses on the extremities due to interference with circulation should be also warmed.

2) Warming methods

In the example shown in Fig. 3-2-51 uses a blanket. Two more blankets may also be used to cover the upper and lower parts of the body. The following care must be exercised when warming a victim:

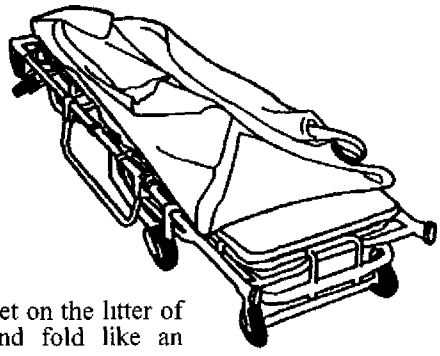
(1) Remove wet clothes from the victim.

(2) Cover the victim's body with a blanket, etc..

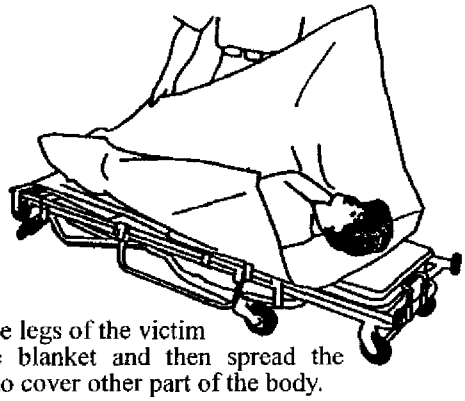
(3) Increase the temperature of the place where the victim is accommodated.

3) Precautions

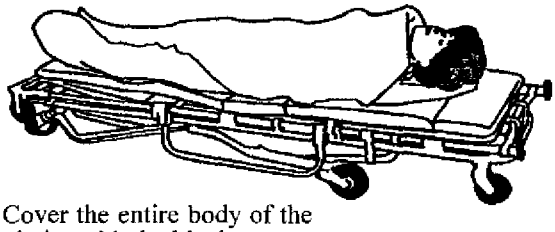
(1) Check the body temperature of the victim to prevent over-warming.



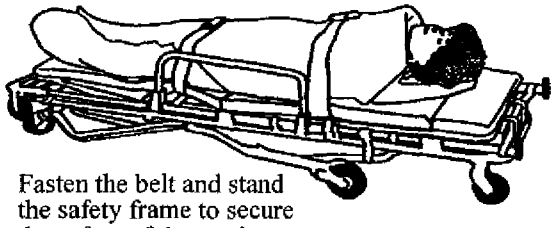
1. Put a blanket on the litter of stretcher and fold like an accordion.



2. Cover the legs of the victim with the blanket and then spread the blanket to cover other part of the body.



3. Cover the entire body of the victim with the blanket.



4. Fasten the belt and stand the safety frame to secure the safety of the victim.

Fig. 3-2-51 Warming method

(2) Cover a victim with a blanket, etc in such a manner that the vital signs can be checked easily

(3) Control the posture of a victim as described in the following section.

11. Body position control

Properly controlling the body position of a victim is important to maintain the respiration and circulation and decrease the pain as well as to prevent the symptoms from worsening. The stretchers currently used are designed so that the back seat can be raised at right angles.

1) Conditions where body position control is necessary

Body position control is necessary to transfer a patient who suffers from a consciousness disorder, respiratory disturbance, shock symptom, congestive heart failure, acute abdomen or the like.

2) Body positions and their applications (Fig. 3-2-52)

(1) Supine position (Fig. 3-2-52 a)

A victim lies down horizontally on his or her back. This is the posture most often used.

(2) Supine position with knees bent (Fig. 3-2-52 b)

Same as the supine position above but the knees of the victim are bent. This position is suitable for victims with abdominal injury or acute stomach sickness. A victim can turn to side himself and bend his knees. This position cannot be forced to a victim.

(3) Prone position (Fig. 3-2-52.c)

A victim lies on his or her stomach with his or her face turned to side. This position is suitable when there is a possibility of obstruction of air passage due to vomiting or there is an injury on the back. However, this position is not proper for cases which require the maintenance of open airway and chest massage.

(4) Side position (Fig. 3-2-52 d)

A victim lies on his or her side. When the victim is unconscious, the first aider should lay the victim with one of his/her legs bent close to his or her body and the elbow of the upper arm bent. This position is also called "Recovery position".

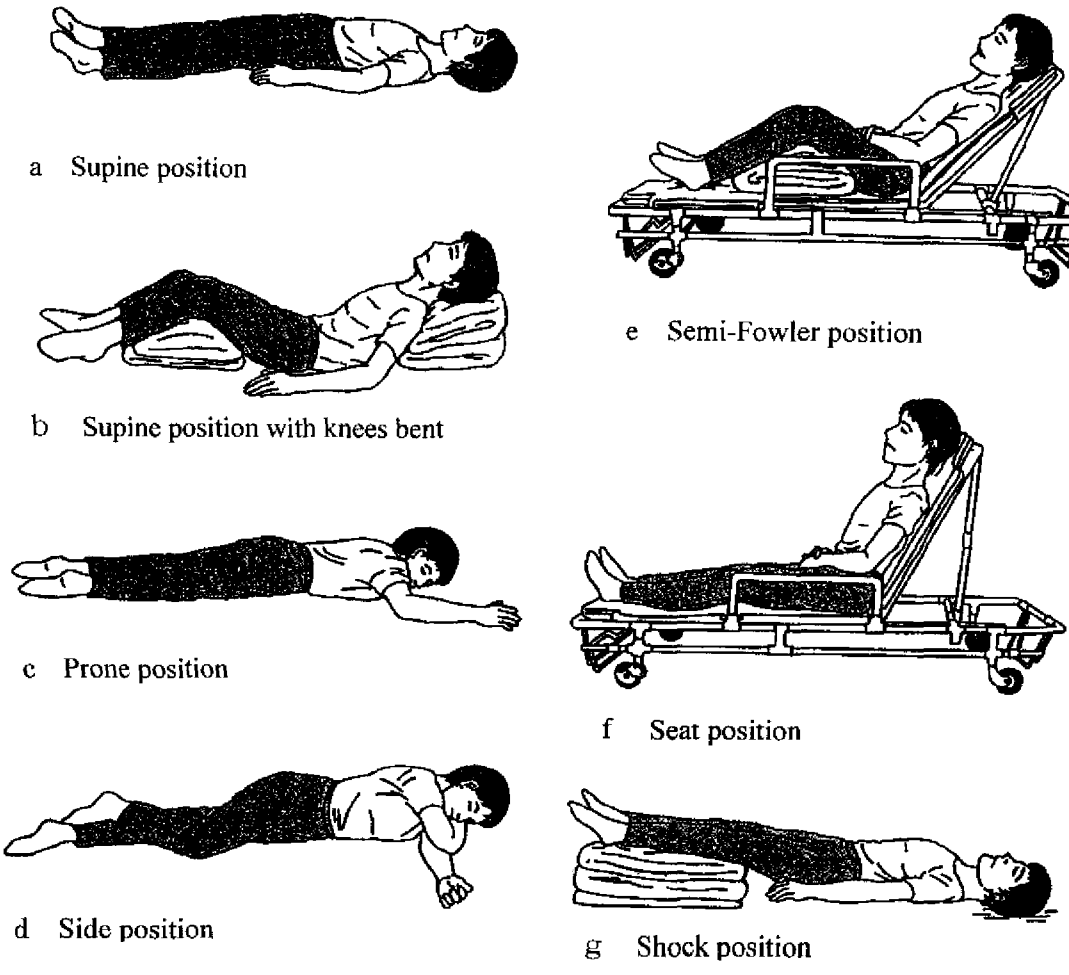
If an introduction of poison into the body is suspected, the victim must lie on his left side to prevent the poison from being sent from the stomach to duodenum.

(5) Semi-Fowler position (Fig. 3-2-52 e)

This position is often used to decrease pulmonary homeostasis caused by cardiac failure or to decrease the intracranial pressure increase caused by cerebrovascular disorder or head injury

(6) Seat position (Fig. 3-2-52 f)

This position is often used for patients with cardiac disorder or bronchial asthma.



a Supine position

b Supine position with knees bent

c Prone position

d Side position

e Semi-Fowler position

f Seat position

g Shock position

Fig. 3-2-52 Body positions

(7) Shock position (Fig. 3-2-52 g)

When a victim develops any shock symptom, the supine position is used with his or her legs elevated Since this position cannot be used on a stretcher, cushion, etc. should be inserted to elevate the victim's legs

3) Precautions

As a rule, you should not force a victim to take a particular position but let the victim be in a position which is comfortable for him or her during transportation. It is also a general rule that the part of the body with an open wound should be elevated.

An abrupt change of body position may affect the symptom of a patient. Therefore, it is essential that change of body position, if necessary, should be performed in a gentle manner to prevent the pain and discomfort of the patient or worsening of the symptom.

12. Continuation of conventional medical care during transportation of patients under medical treatment at home

1) What is the medical treatment at home?

Among patients who suffer from chronic diseases and need continuous medical treatment, some patients stay at home to have medical treatment under the control of a physician, if it is possible. This type of medical treatment is called "medical treatment at home". The number of such patients has been increasing in recent years.

2) Patients under oxygen inhalation

As a rule, oxygen at the same concentration as that prescribed should be used. In case of a patient transfer due to the worsening of the sickness under treatment at home, a higher concentration oxygen inhalation may be necessary.

The oxygen saturation reading by means of a pulse-oxymeter can be an effective indication. Increase the oxygen concentration to maintain the oxygen saturation to a level above 90%.

3) Patient under maintenance of open airway by means of tracheotomy

Tracheotomy cannule should be securely held so that it is not removed and suctions should be performed as necessary. If a cuff is provided, the pressure of the cuff should be properly maintained.

4) Patient under maintenance of nutrition by means of nasotracheal intubation and gastrogavage

Both tubes are provided to feed nutrition. Since no feeding of nutrition is necessary during emergency transportation, what an ambulance personnel should perform is to secure the tubes to prevent them from being removed and to clamp the tubes to prevent reverse flow of the drugs and nutrition already fed.

If the nasotracheal intubation is used as a drain of ileus, the tube must be not only secured to prevent accidental removal but also released to allow reverse flow and maintained at a lower position.

5) Patients with colostomy

Colostomy is an opening exposing a part of the colon onto the abdominal wall. Treatment of feces may be necessary.

6) Patients with indwelling urinary catheter

Accidental removal or clogging due to the bending of the catheter should be prevented. If the bag is positioned at an elevated portion, the urine inside the bag will return to the bladder of the patients, resulting in an infection. The bag must not be placed at a position higher than the bladder of the patient. The bag may be clamped during transportation.

7) Patients receiving central venous nutrition

Accidental removal or breakage of catheter inserted into the vein of patient must be prevented. The injection bottle should be maintained at an elevated position. If the bottle becomes empty, change the bottle or temporarily clamp the catheter Care must be exercised so that air is not fed into the injection tube Proper injection speed must also be maintained.

8) Patients with hemodialysis shunt

There are 2 types of shunts, external shunt and internal shunt. An external shunt is provided on the surface of upper extremity and connects the artery and vein with a catheter. An internal shunt is provided under the skin to connect the artery and vein. In case of an external shunt, accidental removal, twisting or disconnection of joints must be prevented In case of an internal shunt, care must be exercised to prevent damage to the blood vessel around the shunt.

9) Patients receiving peritoneal dialysis

Temporarily stop the peritoneal dialysis by clamping the tube. Prevent the bending or accidental removal of the tube and maintain the end of the tube clean.

10) Precautions in continuation of conventional medical care of patients under medical treatment at home

People request dispatch of an ambulance either in the case that a patient's condition is deteriorating or in the case that something is wrong with performance of a medical treatment at home. You must first judge which case the patient is situated in, and then perform a first aid treatment. It is essential to keep in touch with the doctor in charge of the patient, as it often happens that you need to request the doctor to ride on your ambulance car or you need instructions from the doctor.