SEAFARERS TRAINING CENTER INC

MEDICAL FIRST AID

(Regulation VI/4, Section A-VI/4 and table A-VI/4-1)

In compliance with the 1978 International Agreement on Standards of Training, Certification and Watch keeping for Seafarers Code (STCW as amended)

AIMS

This course aims to provide the training for candidates to provide Medical first aid on board ship, in accordance with section A-VI/4 of the STCW 1978 amended Code.

OBJECTIVES

This syllabus covers the requirements of the STCW 1978 amended Convention Chapter VI, Section A-VI/4, and Table A-VI/4-1. On meeting the minimum standards of competence in Medical first aid, a trainee will be competent to apply immediate first aid in the event of accident or illness on board.

ENTRY STANDAR

For admission to the course should have completed IMO Model Course No. 1.13 Elementary First Aid or attained a similar standard in elementary first aid.

COURSE CERTIFICATION

On successful completion of the course and demonstration of competence, a document may be issued certifying that the holder has met the standard of competence specified in a table VI/4-1 of STCW 1978 amended code.

A certificate may be issued only centers approved by the administration.

COURSE INTAKE LIMITATION

The maximum number of trainees attending each session will depend on the availability of instructors, equipment and facilities available for conducting the training. It should not exceed six trainees per instructor.

STAFF REQUIREMENTS

The course should preferably be under the control of a qualified medical practitioner assisted by other appropriately trained staff.

TRAINING FACILITIES AND EQUIPMENT

Ordinary classroom facilities .
The following equipment should be available:

Ship's medical chest with contents (no drugs)
Various splints, braces, etc
Dressing, bandages
Life-size dummy for practical resuscitation training

TEACHING AIDS

A1 Instructor Manual (Part D of the course)

BIBLIOGRAPHY

International Medical Guide for Ships.pdf

COURSE OUTLINE AND TIMETABLE

COURSE OUTLINE

Competence: Apply immediate first aid in the event of accident or illness on board.

COURSE OUTLINE	APPROXIMATE TIME (Hours)
Knowledge, understanding and proficiency	**Lectures, demonstrations and practical work**
1. Immediate action	2.0
2. First-aid kit	1.5
3. Body structure and function	2.5
4. Toxicological hazards aboard ship	3.5
5. Examination of patient	1.5
6. Spinal injuries	3.0
7. Burns, scalds and effect of heat and cold	3.0
8. Fracture, dislocations and muscular injuries	3.0
9. Medical care and rescued persons, including distress, hypothermia and cold exposure	2.0
10. Radio medical advice	1.0
11. pharmacology	2.5
12. sterilization	0.5
13. Cardiac arrest, drowning and asphyxia	2.0
14. Psychological/psychiatric problems	2.0
15. Review and assessment	1.0
TOTAL	31.0

Note: Teaching staff should note that outlines are suggestions only as regards sequence and length of time allocated to each objective. These factors may be adapted by lectures to suit individual group of trainees depending on their experience, ability, equipment and staff available for training.

Period/Day	1st Day	2nd Day	3th Day	4th Day
1st Period	1. Immediate action	4.Toxicological hazards	8. Fracture, dislocations and muscular injuries (Continued)	11. Pharmacology (Continued)
2nd Period	1.Immediate action (continued) 2. First-aid kit	4.Toxicological hazards (continued) 5. Examination of patient	8. Fracture, dislocations and muscular injuries (Continued) 9. Medical care and rescued persons, including distress, hypothermia and cold exposure	12. sterilization 13. Cardiac arrest, drowning and asphyxia
LUNCH BREAK				
3rd Period	2.First-aid kit (continued) 3. Body structure and function	6. Spinal injuries 7. Burns scalds and effects of heat and cold (Continued)	9. Medical care and rescued persons, including distress, hypothermia and cold exposure (Continued) 10. Radio Medical Advise	13. Cardiac arrest, drowning and asphyxia. (Continued) 14.Psychological/psychiatric problems
4th Period	3.Body structure and function (continued)	8. Fracture, dislocations and muscular injuries	10. Radio Medical Advise (Continued) 11. Pharmacology	14.Psychological/psychiatric problems (Continued) 15. Review assessment

1.0 IMMEDIATE ACTION

Minor injuries will be curable with first aid on board or medical attention ashore at the next port. In a serious case, however, an immediate medical procedure has to be taken. If the vessel is in port, the injured or diseased crew member can be ferried to a hospital by an ambulance but if it happens at sea, medical procedure has to be taken on board. Proper and prompt care is vital. The following steps should be considered and taken:

- First aid
- Notice to the owners and managers to seek advices
- Consultation with rescue center through INMARSAT or the radio
- Alteration of course to the nearest port
- Request for a paramedic or rescue helicopter
- Request for assistance of P&I correspondents

In an injury case, the time, date, place and cause of injury should be recorded. The evidence should be preserved and a witness statement should be taken. These documents will be helpful in investigation by authorities. In an illness case, proper aid and medical care should be provided, getting the detailed symptoms from the sick crew member.

- Notice to the nearest P&I correspondents

For prevention of jump ship, it is advisable for the Master to keep passport, seaman's book and license of all the crew members.

Cautions in investigations

In an injury, loss of life, missing or jump ship case, police and/or immigration officers come on board for investigation. In a loss of life case, an inquest will be conducted. Full cooperation should be given to formal inquiries by relevant authorities, but before answering questions, identity of the investigators should be confirmed. Answers to the questions should be truthful. When signing statement, the Master should carefully check its contents.

Cautions in writing Master's Report

Master's Report is important evidence to judge whether the injury, illness or death is work related or not. Accordingly, the report has to be a truthful and objective based on the incident. If there are witnesses, their statements should also be obtained. Photos of the site and other evidence should be preserved.

Necessary documents

- Master's Statement of Fact
- Witness report
- Communications with the owners, managers, medical advisors and authorities
- Deviation report
- Photos of the place of incident Important points
- Loss prevention by daily education, training and health control
- Stock of necessary medical kit and first aid training
- Careful decision in treatment and proper first aid
- Notice to owners, managers, agents, authorities and P&I correspondents
- Recording and writing statement of the fact and preservation of evidence

It may well be considered very difficult to totally avoid illness or injury, but exercising regularly and following fl ow chart may decrease symptoms of illness or injury.

2.0 FIRST - AID KIT

All workers must be able to access a first aid kit. This will require at least one first aid kit to be provided at their workplace.

Contents

The first aid kit should provide basic equipment for administering first aid for injuries including:

- cuts, scratches, punctures, grazes and splinters
- muscular sprains and strains
- minor burns
- amputations and/or major bleeding wounds
- broken bones
- eye injuries
- shock.

The contents of first aid kits should be based on a risk assessment. For example, there may be higher risk of eye injuries and a need for additional eye pads in a workplace where:

- chemical liquids or powders are handled in open containers
- spraying, hosing or abrasive blasting operations are carried out
- there is any possibility of flying particles causing eye injuries
- there is a risk of splashing or spraying of infectious materials
- welding, cutting or machining operations are carried out.

Additional equipment may be needed for serious burns and remote workplaces.

The recommended content of a typical first aid kit and information on additional equipment is provided in the following example.

Example of contents for a first aid kit

For most workplaces, a first aid kit should include the following items:

Item	Kit contents Quantity
Instructions for providing first aid – including Cardio-Pulmonary Resuscitation (CPR) flow chart	1
Note book and pen	1
Resuscitation face mask or face shield	1
Disposable nitrile examination gloves	5 pairs
Gauze pieces 7.5 x 7.5 cm, sterile (3 per pack)	5 packs
Saline (15 ml)	8
Wound cleaning wipe (single 1% Cetrimide BP)	10
Adhesive dressing strips – plastic or fabric (packet of 50)	1
Splinter probes (single use, disposable)	10
Tweezers/forceps	1
Antiseptic liquid/spray (50 ml)	1
Non-adherent wound dressing/pad 5 x 5 cm (small)	6
Non-adherent wound dressing/pad 7.5 x 10 cm (medium)	3
Non-adherent wound dressing/pad 10 x 10 cm (large)	1
Conforming cotton bandage, 5 cm width	3
Conforming cotton bandage, 7.5 cm width	3
Crepe bandage 10 cm (for serious bleeding and pressure application)	1
Scissors	1
Non-stretch, hypoallergenic adhesive tape – 2.5 cm wide roll	1
Safety pins (packet of 6)	1
BPC wound dressings No. 14, medium	1
BPC wound dressings No. 15, large	1
Dressing – Combine Pad 9 x 20 cm	1
Plastic bags - clip seal	1
Triangular bandage (calico or cotton minimum width 90 cm)	2
Emergency rescue blanket (for shock or hypothermia)	1
Eye pad (single use)	4
Access to 20 minutes of clean running water or (if this is not available) hydro gel (3.5 gm sachets)	5
Instant ice pack (e.g. for treatment of soft tissue injuries and some stings).	1

Medication, including analgesics such as paracetamol and aspirin, should not be included in first aid kits because of their potential to cause adverse health effects in some people including asthmatics, pregnant women and people with medical conditions. The supply of these medications may also be controlled by drugs and poisons laws. Workers requiring prescribed and over-the-counter medications should carry their own medication for their personal use as necessary.

Some types of workplaces may require additional items to treat specific types of injuries or illnesses.

Outdoor work

If work is performed outside and there is a risk of insect or plant stings or snake bites, assess whether the following items should also be included in the first aid kit:

- a heavy duty crepe bandage
- sting relief cream, gel or spray.

Remote work

Where people work in remote locations, a first aid kit should include:

- a heavy duty crepe bandage 10 cm (for snake bites)
- large clean sheeting (for covering burns)
- thermal blanket (for treating shock)
- whistle (for attracting attention)
- torch/flashlight.

The appropriate contents will vary according to the nature of the work and its associated risks.

Burn injuries

If your workers are at risk of receiving burns, you should include the following items:

- burn treatment instructions on two water-proof instruction cards: one for the first aid kit and the other to be located on the wall next to the emergency shower or water supply
- hydro gel (8 × 3.5 gram sachets)
- hydro gel dressings
- clean polythene sheets (small, medium and large)
- 7.5cm cotton conforming bandage.

LOCATION

In the event of a serious injury or illness, quick access to the kit is vital. First aid kits should be kept in a prominent, accessible location and able to be retrieved promptly. Access should also be ensured in security-controlled workplaces. First aid kits should be located close to areas where there is a higher risk of injury or illness. For example, a school with a science laboratory or carpentry workshop should have first aid kits located in these areas. If the workplace occupies several floors in a multi-storey building, at least

one kit should be located on every second floor. Emergency floor plans displayed in the workplace should include the location of first aid kits.
A portable first aid kit should be provided in the vehicles of mobile workers if that is their workplace (for example, couriers, taxi drivers, sales representatives, bus drivers and inspectors). These kits should be safely located so as not to become a projectile in the event of an accident.

MEDICAL RESOURCES ABOARD LIFEBOAT

Lifeboats, life-rafts, life-floats, and buoyant apparatus should be furnished with certain provisions. The equipment must be of good quality, efficient for the purpose for which it is intended, and kept in good condition. The lifeboats for ocean and coastwise, seagoing, self-propelled vessels should each equipped with a first aid kit.

When ships travel by infrequently used waterways or in colder climates, it is advisable to have in addition a more comprehensive survival kit (in waterproof packaging) prepared and ready to be placed aboard lifeboats or life-rafts, when needed. Contents for such a kit are proposed in table 1.

This list of medicaments and surgical supplies is planned for a complement of 20-30 survivors for a period of one week.

This ship's master should assign the individual in charge of the sick-bay and medicine chest to prepare medical survival, or have them prepare ashore. The person designated by the master to be responsible for these kits should store them in a compartment that can be maintained at temperatures above freezing, but not above room temperature. On abandoning ship, it would be this person's responsibility to see that the officer-in-charge of a lifeboat receives such a kit.

Injectable doses of morphine sulfate may be stored in these kits. However, the ship´s compartment in which morphine sulfate is store should be locked securely at all times and checked at frequent intervals by the master. The master and the officer concerned should be the only with the key or lock combination.

Table 1. Medical survival kit [a] suggested for lifeboats aboard merchant vessels

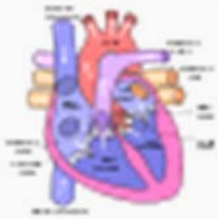
Description Of Item	Unit	No. of Units	Comments
Medicaments			
Acetylsalicylic acid tablats, 300 mg, 100s	bottle	1	Minor aches or pain, antipyretic
Cyclizine hydrochloride tablets, 50 mg, 100s	bottle	5	Seasickness, mild antihistamine
Diazepam tablets, 5mg, 100s	bottle	3	Tranquillizer (controlled substance)
Morphine sulfate injection, 10 mg/ml, 1 ml disposable cartridge, [b] 10s	package	1	Analgesic, sedative (controlled substance)
	bottle	1	Heat cramps
Sodium chloride tablets, 1 g, 100s	package	40	Protection against Sunburn

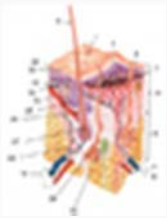
Tetracycline hydrochloride capsule, 250 mg, 100s	bottle	2	Broad-spectrum anbiotic
Surgical supplies			
Bandage, elastic, 10 cm roll, 12s	box	1	
Bangade, gauze, roll, sterile, 10 cm x 10 m, 12s	box	1	
Bandage, absorbent, adhesive, 2 cm x 8 cm, 100s	box	1	
Pad, sterile, 10 cm x 10 cm, 100s	box	2	
Scissors, bandage, lister	item	1	
soap	cake	20	
sunglasses	item	20	
Syringe hypodermic cartridge holder[b]	item	2	
Tape, adhesive, surgical, 5 cm x 5 m roll, 6s	box	1	
Thermometer, clinical	item	2	

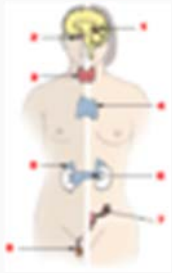
[a] To be available in the event of forced abandonment of a vessel in unfrequented waterways.
[b] The disposable cartridge for the medicament and the syringe holder should be purchased from the same supplier, to make sure that the cartridge will fit the syringe.

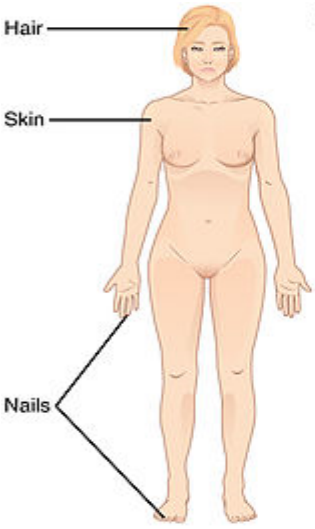
3.0 BODY STRUCTURE AND FUNCTION

SYSTEM	CLINICAL STUDY
	The **nervous system** consists of the central nervous system (the brain and spinal cord) and the peripheral nervous system. The brain is the organ of thought, emotion, memory, and sensory processing, and serves many aspects of communication and controls various systems and functions. The **special senses** consist of vision, hearing, taste, and smell. The eyes, ears, tongue, and nose gather information about the body's environment.

	The **musculoskeletal system** consists of the human skeleton (which includes bones, ligaments, tendons, and cartilage) and attached muscles. It gives the body basic structure and the ability for movement. In addition to their structural role, the larger bones in the body contain bone marrow, the site of production of blood cells. Also, all bones are major storage sites for calcium and phosphate. This system can be split up into the muscular system and the skeletal system.
	The **circulatory system** or **cardiovascular system** comprises the heart and blood vessels(arteries, veins, and capillaries). The heart propels the circulation of the blood, which serves as a "transportation system" to transfer oxygen, fuel, nutrients, waste products, immune cells, and signalling molecules (i.e., hormones) from one part of the body to another. The **blood** consists of fluid that carries cells in the circulation, including some that move from tissue to blood vessels and back, as well as the spleen and bone marrow.
	The **respiratory system** consists of the nose, nasopharynx, trachea, and lungs. It brings oxygen from the air and excretes carbon dioxide and water back into the air.
	The **digestive system** consists of the mouth including the tongue and teeth, esophagus,stomach, gut (gastrointestinal tract, small and large intestines, and rectum), as well as the liver,pancreas, gallbladder, and salivary glands. It converts food into small, nutritional, non-toxicmolecules for distribution by the circulation to all tissues of the body, and excretes the unused residue.

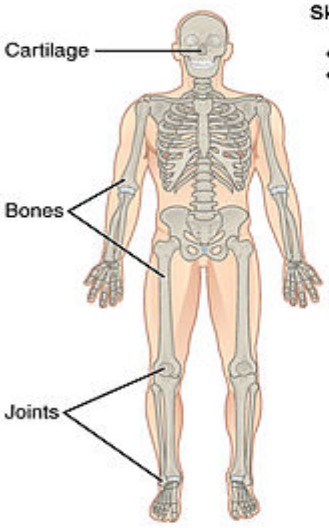
	The **integumentary system** consists of the covering of the body (the skin), including hair andnails as well as other functionally important structures such as the sweat glands and sebaceous glands. The skin provides containment, structure, and protection for other organs, but it also serves as a major sensory interface with the outside world.
	The **urinary system** consists of the kidneys, ureters, bladder, and urethra. It removes water from the blood to produce urine, which carries a variety of waste molecules and excess ions and water out of the body.
	The **reproductive system** consists of the gonads and the internal and external sex organs. The reproductive system produces gametes in each sex, a mechanism for their combination, and a nurturing environment for the first 9 months of development of the infant.
	The **immune system** consists of the white blood cells, the thymus, lymph nodes and lymphchannels, which are also part of the lymphatic system. The immune system provides a mechanism for the body to distinguish its own cells and tissues from alien cells and substances and to neutralize or destroy the latter by using specialized proteins such as antibodies, cytokines, andtoll-like receptors, among many others.
	The main function of the **lymphatic system** is to extract, transport and metabolize lymph, the fluid found in between cells. The lymphatic system is very similar to the circulatory system in terms of both its structure and its most basic function (to carry a body fluid).

	The **endocrine system** consists of the principal endocrine glands: the pituitary, thyroid, adrenals, pancreas, parathyroids, and gonads, but nearly all organs and tissues produce specific endocrine hormones as well. The endocrine hormones serve as signals from one body system to another regarding an enormous array of conditions, and resulting in variety of changes of function. There is also the exocrine system.



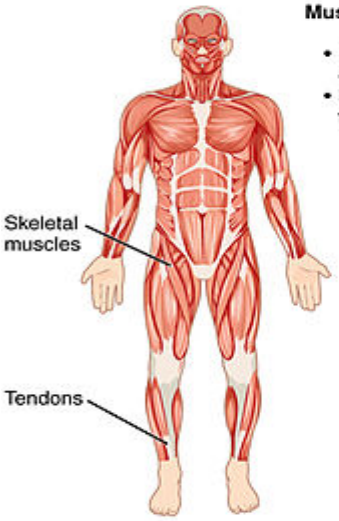
Integumentary System

- Encloses internal body structures
- Site of many sensory receptors



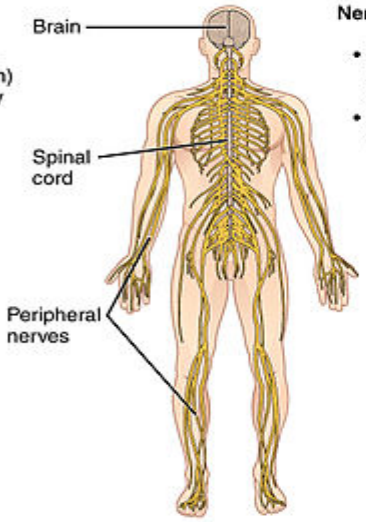
Skeletal System

- Supports the body
- Enables movement (with muscular system)



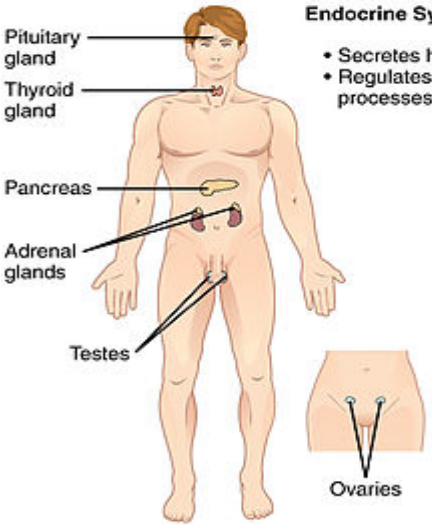
Muscular System

- Enables movement (with skeletal system)
- Helps maintain body temperature



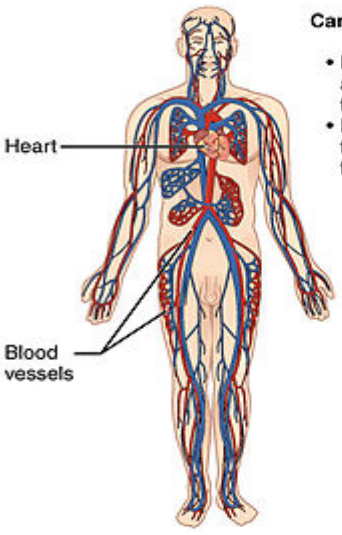
Nervous System

- Detects and processes sensory information
- Activates bodily responses



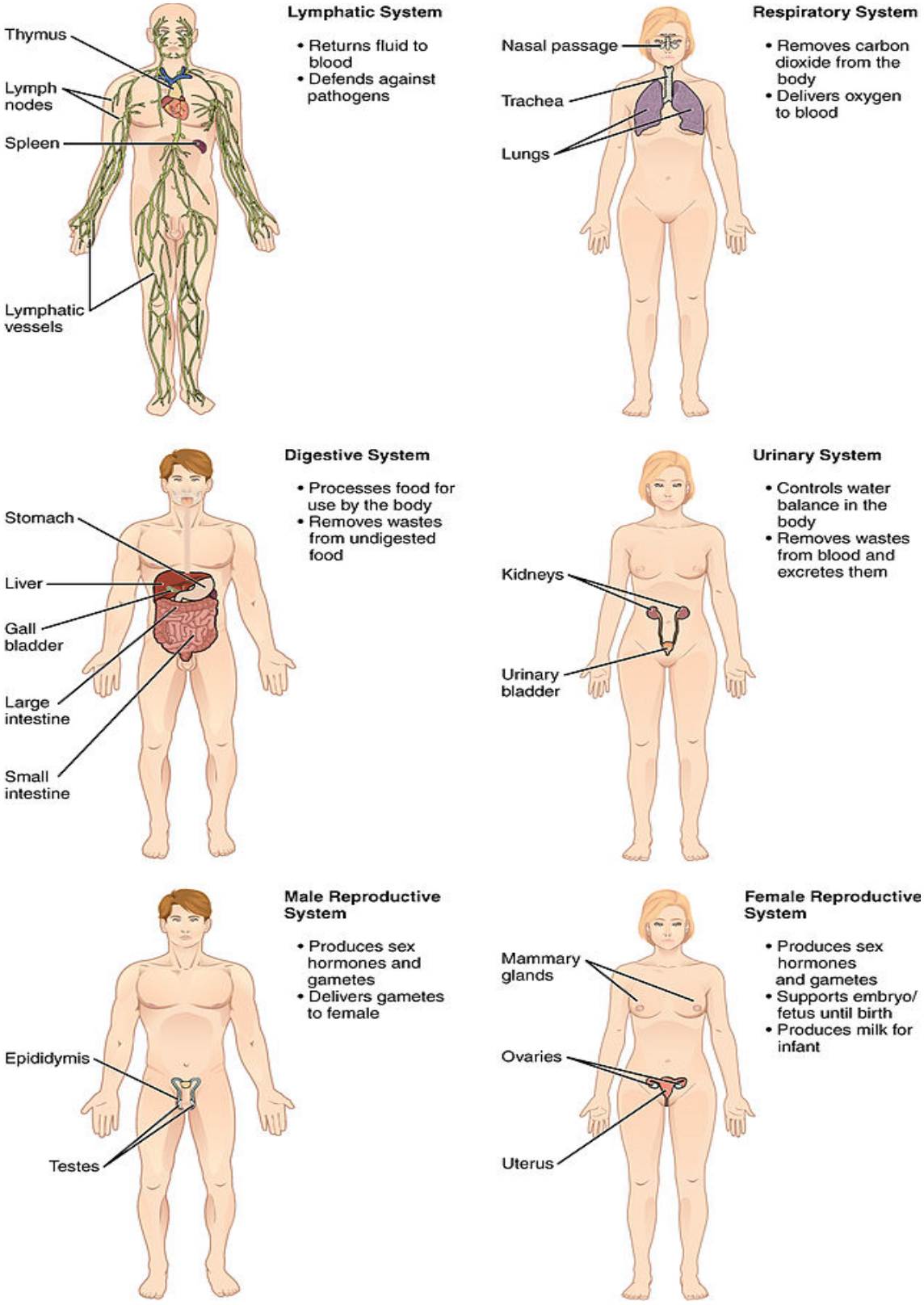
Endocrine System

- Secretes hormones
- Regulates bodily processes



Cardiovascular System

- Delivers oxygen and nutrients to tissues
- Equalizes temperature in the body



4.0 TOXICOLOGICAL HAZARDS ABOARD SHIP

Ships carry a number of substances in addition to cargo that are potentially toxic. For instance, medicines are not generally poisonous but can become so if taken other than as

prescribed. Then there are substances like cleaners, degreasers, and disinfectants that can give rise to toxic hazards through misuse. For instance, emptying a bucket of bleaching solution into a lavatory bowl containing a proprietary caustic cleaner may result in the release of poisonous gas in a confined space.

Toxic substances can affect the body in various ways:

- Through the lungs by inhalation of toxic gases and fumes;
- Through the mouth and digestive system, if swallowed;
- Through skin contact;
- Through eye contact.

Breathing in is the most common route of poisoning in the shipping industry and the toxic substance may consist of vapour, gas, mist, spray, dust, or fumes. Swallowing of a poison occurs less frequently and is usually the result of an accident. Absorption through the skin and by inhalation may have a delayed effect. The substances that cause harm do so by burning, or causing local damage to, the skin, eyes, or other tissue, or by general poisoning after absorption. Allergic reactions are also possible. The effects may be sudden and dramatic ¡, or gradual and cumulative. The damage may be temporary or permanent. Suspect every chemical to be dangerous until you know otherwise. Whatever the cause of the poisoning, treatment must be prompt. Complications of poisoning can be avoided by rapid emergency treatment.

Diagnosis of poisoning

The diagnosis of poisoning may be simplified if one or more of the following factors point to the probable cause:

- The circumstances of the incident, leak-age of chemicals;
- The nature of the illness, and its relationship in time to recent exposure to chemicals;
- The epidemiological aspects, if more than one person is involves and all develop a similar illness.

It must be realized however that:

- The effect of some poisons resemble those of natural illness, vomiting and diarrhoe, or collapse;
- Because a ship is carrying a cargo of chemicals it does not follow that the cargo is responsible for the illness (this is, in fact, unlikely unless there is evidence of a leakage);
- Different individuals may be exposed to the poison at different times, or to a different extent during a single episode, and they may as a result become ill at different times or to different degrees;
- Individuals react differently to poisons according to their health, their constitution, and the extent of their exposure to the poison.

In a typical case of poisoning, three stages of illness may be distinguished, namely latent, active, and late.

The latent stage

This is the interval between the moment of entry of a poison into the body and the appearance of the first symptoms (feelings) or sign. These usually occur rapidly after exposure, but in some cases there may be a delay of several hours before they develop.

THE ACTIVE STAGE

This is the stage at which the signs and symptoms of the poisoning are apparent. Often there are a great many different chemicals that could produce these sign and symptoms and they therefore have to be treated in a general way.

The general symptoms of poisoning include:

- Headache
- Nausea and vomiting
- Drowniness
- Changes in mental behavior
- Unconsciousness
- Convulsions
- Pain

Sings of several poisoning are:

- A rapid and weak pulse
- Grey or blue colour of the skin
- Severe difficulty in breathing
- A prolonged period of unconsciousness.

THE LATE STAGE

The signs and symptoms usually resolve after a few hours in the majority of incidents, particularly if the degree of exposure is small. If a greater amount of chemical has been absorbed, or the period of exposure prolonged, or the chemical is very toxic, symptoms may persists for some hours or even days. The patient's conditions may deteriorate as a result of complications, the most common of which are: suffocation, bronchitis, pneumonia, pulmonary oedema, heart failure, circulatory collapse, liver failure, and kidney failure.

For details regarding various toxins, the signs and symptoms of poisoning by them, and the appropriate first aid and follow-up treatment, refer to medical first aid for use in accident involving dangerous goods, the chemical supplement to the present guide.

INHALED POISONS

Many chemicals produce fumes that can irritate the lungs and cause difficulty in breathing. They also produce such symptoms as cough and burning sensation in the chest.

Gases such as carbon dioxide and carbon monoxide may also be poisonous, particularly in a confined space, because they replace oxygen in the air and blood.

The main symptoms are:

- Difficulty in breathing
- Headache, dizziness, and nausea
- Unconsciousness in some cases.

Always remember that some poisonous gases, such as carbon dioxide, carbon monoxide, and some refrigerant gases, have no smell to warn you of their presence

Remember that the presence of certain gases, hydrogen, may make it necessary to take precautions against fire and explosion.

TREATMENT

- Remove the casualty at once into the fresh air. Loosen tight clothing and ensure a free airway.
- Start artificial respiration by the mouth – to- mouth method if breathing is absent.
- Start heart compression if the heart has stopped. In case of carbon monoxide and toxic gas poisoning, give oxygen as soon as the spontaneous respiration has been restored.
- Keep the patient at rest in bed for at least 24 hours or until he has fully recovered.
- Complications may occur after this type of poisoning. They are: severe difficulty in breathing, with frothy sputum (pulmonary oedema) and pneumonia and bronchitis.

Do not give morphine to a casualty who has been gassed.

SWALLOWED POISONS

Most of these exert their dangerous effect on the stomach and intestines causing retching, vomiting (sometimes the vomit is bloodstained), abdominal pain, colic, and later diarrhea. Examples of such poisons are arsenic, lead, poisonous fungi, berries, and contaminated or decomposed food. Particularly severe symptoms are caused by corrosives, strong acid, alkalis, or desinfectants, which burn the lips and mouth and cause intense pain.

Other poisons produce general toxic effects without irritation of the gastrointestinal tract. After ingestion, the onset will be gradual, following their absorption into the blood stream

and their effect on the nervous system, which may cause unconsciousness and death. Examples are the various types of sedative tablets or medicines for pain relief, when taken in excessive amount. Alcohol taken to excess may likewise act as an acute poison.

Treatment

Identify the nature of the poison, if possible. If the victim is conscious and in pain, he will usually cooperate, if he is unconscious, there may be a bottle or container nearby which will provide the answer. Do not, however, waste time over identification. Prompt treatment is more important.

Do not make the casualty vomit

If the casualty is conscious, give one sachet of activated charcoal in 500 ml (half a litre) of water.

If the casualty is unconscious, put him in the unconscious position and:

Give artificial respiration if breathing has stopped;

Give heart compression if the heart has stopped;

DO NOT give anything by mouth;

Seek RADIO MEDICAL ADVICE if the casualty remains unconscious

In cases of hydrogen cyanide (prussic acid) poisoning where breathing and pulse are present, break an ampoule of amyl nitrite into a clean handkerchief or cloth and hold it under the patient's nose so that he inhales the vapour.

All patients should be kept warm in bed until they have recovered.

SKIN CONTACT

Toxic substances can affect the skin in two ways:

- By direct contact, causing redness and irritation and, in severe cases, burns of the skin;
- By absorption through the intact skin, producing general symptoms such as drowsiness, weakness, and in rare cases unconsciousness.

TREATMENT

- The contaminated clothing and shoes should be removes immediately.
- Wash off the chemical with copious amounts of lukewarm water for at least 10 minutes. Continue for a further 10 minutes if there is any evidence of chemicals still on the skin.

- If a burn are severe and extensive, obtain RADIO MEDICAL ADVICE.

EYE CONTACT

Many substances, notably chemical liquids, and the fumes of certain chemicals will produce redness and irritation if the eyes are accidentally splashed by, or exposed to, them. Treatment should be immediate.

Wash the substances out of the eye with copious amounts of fresh water as quickly as possible, keeping the eyelids wide open. This must be done thoroughly for 10 minutes. If ther is any doubt whether the chemical has been completely removed, repeat washing for a further 10 minutes. If severe pain is experienced, physical restraint of the patient may be necessary in order to be certain of effective treatment. For pain, give two paracetamol tablets by mouth every four hours until the pain subsides.

Get RADIO MEDICAL ADVICE.

SPECIAL CONSIDERATIONS

If you are dealing with a suicide attempt, it is your duty to do everything you can to save the victim's life and to guard against further attempts.

Important: the patient should not be left without an attendant.

You should save any remains of poison that you may find in a glass, cup, bottle or package. Also collect any vomited matter in a bowl and seal it in a bottle. These items may be helpful for identifying the toxic substance and deciding on further treatment after the patient has been by a doctor or taken ashore.

SPECIFIC TOXIC SUBSTANCES

DRUGS

Many drugs can be taken accidentally or in an attempt at suicide. The most common are sedatives (sleeping tablets) and tranquillizers. These include the barbiturates and such drugs as diazepam. They usually cause gradual onset of unconsciousness, which may be prolonged. The breathing may slow down and become shallow. In severe cases it may stop. In barbiturate poisoning unconsciousness may be present for several days, but the majority of patients recover.

Simple pain-killers such as acetylsalicylic acid and paracetamol may also take in overdose. Acetylsalicylic acid cause vomiting, ringing in the ears, and deep rapid breathing in the gut and the patient may vomit up bright red blood. Paracetamol does not usually cause any immediate symptoms except occasional vomiting. It can, however,

cause liver damage 2 or 3 days after being swallowed if more than 20-30 tablets are taken. Neither of these drugs causes unconsciousness.

DISINFECTANTS

Many types of disinfectant such as carbolic acid, cresol, and bleaching solution are toxic.

Carbolic acid (phenol) and cresol cause a severe rash on contact with the skin in dilute solutions. If they are swallowed, burns of the mouth will occur, and there may be severe vomiting, followed by collapse and unconsciousness. Convulsions may occur.

Bleaches are usually solutions of sodium hypochlorite in water. They cause irritations of the skin and are poisonous if swallowed. The patient may complain of burning in the mouth and stomach and feel generally unwell.

On contact with acids, these substances release fumes that are irritating to the lungs, causing a cough; a feeling of breathlessness, and burning in the throat. However, the fumes are not severely toxic, and the symptoms usually subside rapidly.

SOLVENTS, PETROLEUM PRODUCTS, AND FUEL OILS

There substances usually cause symptoms after the vapours have been accidentally inhaled. The symptoms are drowsiness, dizziness, nausea, and occasionally vomiting.

If severe exposure occurs, the patient may become unconscious. If the substances are swallowed, they usually produce the same symptoms, but the nausea and vomiting are worse.

CYANIDE

Hydrogen cyanide gas is used in fumigating ships. Both the solid cyanide and the gas are extremely poisonous, and symptoms and sign may develop very rapidly. They are slightly corrosive, if swallowed, and cause a burning felling in the mouth and in the abdomen. However the main danger is general poisoning. There will be shortens of breath, anxiety and rapid loss of consciousness. Convulsions can occur. Death may result within a few minutes.

CARBON DIOXIDE (CARBONIC ACID GAS)

Suffocation by this odorless gas may occur when its concentration in the air is so high that it replaces a substantial part of the oxygen. This may happen while crew – members are dealing with a fire in a hold. The gas is also produced if grain in the hold ferments, and it may be generated by refrigerated cargoes of certain foods; it is also used as a refrigerant. The gas is heavier than air and collect in the lower parts of hold and

compartments. A person exposed to it experiences giddiness, difficulty in breathing and headache. Later he may fall down and lose consciousness.

CARBON MONOXIDE

This odorless inflammable gas also occurs in hold fires, as the produce of an oil-driven engines, and when refrigerated meat cargoes decompose. It is lighter than air and highly poisonous, even in very low concentrations.

A person suffering from the effect of this gas feel giddy, often with muscular weakness; he may become unconscious quickly , in severe cases, the lips may be bright red, and the skin of the face and body pink in colour.

REFRIGERANT GASES

Inhalation of ammonia vapour will cause intense irritation, ranging from a catching of the breath with smarting and watering of the eyes (in the case of low concentration) to intense irritation and corrosion of the whole air passage, gasping for breath, collapse, and death (when concentrations are high).

Carbon dioxide is also present in refrigerants, if a person become faint or losses consciousness in a refrigerating plant where there is no evidence of escaping ammonia, he is probably suffering from the effect of carbon dioxide.

Methyl chloride is a colourless gas, smelling like ether. It may cause drowsiness, mental confusion, coma, nausea, vomiting, convulsions, and death. It is also dangerous in low concentration because of its explosive nature. On no account should any naked light be exposed in the presence of the vapour; electrical motor should be stopped to avoid the risk of sparking. A heavy-duty electric torch, switched on before approaching the leak, is the only safe light to use.

Freon is an odourless gas, which is generally harmless, except when present in a concentration high enough to deprive a person of sufficient oxygen. The sign of oxygen deficiency are faintness, staggering gait, collapse, and unconsciousness.

POISONOUS GASES FROM REFRIGERATED CARGOES

Certain refrigerated cargoes, including fruit, vegetables, and cheese, generate carbon dioxide during normal storage. With any failure of a refrigerating plant, food cargoes (especially meat) may generate poisonous and inflammable gases. This can be particularly dangerous if the cargo space is flooded. Carbon monoxide, ammonia, hydrogen sulfide, and hydrogen may be generated in addition to carbon dioxide. In any great concentration these gases are extremely poisonous and some are explosive. Full

precautions against fire and explosive must be taken in addition to those against suffocation and poisoning.

OTHER GASES

Trichloroethene – usually called trilene or "trike" – is a volatile anaesthetic gas which cause drowsiness, mental confusion, nausea, vomiting, and coma. It can also result in death. It is used medically in obstetrics and dentistry because it acts quickly. In the impure form it is used as a dry-cleaning agent. Some people are addicted to "sniffing".

PEVENTION OF POISONING

Remember: prevention is better than cure

Knowledge of the basic safety precautions and strict adherence to them by people working with dangerous goods, and also knowledge of the conventional labelling of these goods, play an important part in the prevention of poisoning.

For the handling of some dangerous goods, protective clothing (rubber or plastic gloves, aprons, boots) and breathing apparatus (compressed air system, smoke helmet) may be required and should be provided. They should be kept on board ship and be available at the workplace, regularly inspected, and cleaned or replaced. Adequate washing and shower facilities for the workmen should be provided nearby.

In the event of a leakage or spillage involving dangerous gas or fumes, the use of a gas detector is advices before a space is declares to be free. Gas masks will not provide complete protection, but may be used to aid escape. The place where leakage has occurred should be immediately treated with an appropriate neutralizing substance and then covered with sand, which should afterwards be removed in a special container to a safe place.

Hold and closed spaces in which toxic vapours and gases could accumulate should be thoroughly ventilates, and a gas detector (not an explosimeter) used, before people are allowed to enter and also during cargo-handling operations: places used for the storage of dangerous goods should be decontaminated, if necessary, after use and / or before reuse.

Dangerous goods should not be carried or stored in proximity to other materials (particularly foodstuffs) that, as a result of contact with dangerous goods, could cause illness or accidents (poisoning).

5.0 EXAMINATION OF PATIENT

A systematic and complete examination of the patient is essential to evaluate the extend of an illness. Such an examination is composed of two basic parts. (1) the history, a chronological story of the patient's illness from the first symptoms to the present time;

and (2) the physical examination, in which the patient is examined for physical evidence of disease. The findings should be recorded accurately, concisely, and completely.

Many patient reporting to the sick-bay may have a minor illness or injury, such as a splinter or blister, that often requires only a brief examination, in which the patient is examined for physical evidence of disease. The findings should be recorded accurately, concisely, and completely.

Many patients reporting to the sick- bay may have a minor illness or injury, such as a splinter or blister, that often requires only a brief examination prior to treatment for the soecific complaint. Patients who appear quite ill will require a thorough evaluation and a more detailed examination.

An accurate record should be made of all phases of every illness, beginning with the history and physical examination. Daily records should be kept during the course of the illness. Often the diagnosis will not be evident when the patient is first seen, but, as complaints and delayed physical signs appear in the next several days, the symptom complex may become clearer. Many infectious diseases first manifest themselves only as fever and general malaise, but in several days a rash may appear (as in measles), or jaundice (as in hepatitis), or a stiff neck and coma (as in meningitis). These signs and symptoms help to establish a definitive diagnosis.

A clear, concise recording of the signs and symptoms of the patient's illness is important in communication by radio, or when a patient is transferred to a physician's care.

HISTORY TAKING

Taking the history is an important part of the examination and often a diagnosis may be made from the history alone. All possible information should be obtained and organized logically to tell the story of the patient's illness.

Recorded history should begin with the time the patient first noted any symptoms of sickness, body changes, or a departure from good health. Symptoms and events up to the present time should be include. The date or time at which various symptoms appeared should be noted as precisely as possible. The patient should be encouraged to talk freely, without interruption. Specific leading questions should be asked.

Some questions that will help the patient to give the history are:

- "How did your illness start?"
- "What was the first symptom you noticed?"
- "How long have have you had this?"
- "How and where does it affect you?"
- "What followed?"

It is important to be specific about the main symptom or symptoms, such as pain in the abdomen or severe headache. Time should not be wasted on vague symptoms such as tiredness, weakness, and loss of appetite. These non – specific symptoms are a part of almost every illness. The patient should be asked if he has ever experienced similar symptoms or had the condition or problem before. He should be asked for the diagnosis of any similar situation in the past, the treatment that was prescribed, and the medicaments he had taken. Also, any medicaments that the patient is currently taking should be noted, because his present illness might be a reaction to medication (for instance, allergy to penicillin or another drug).

PAIN

Pain is one of the most common bodily symptoms. These are questions that should be asked:

- "How did the pain start?" "What were you doing at the time?"
- "where is the pain located?" (ask the patient to point to the area of pain so you can specific in you noted)
- "How severe is the pain?" "Does it make you double up?" "What is the pain like?" (cramping, sharp, dull, or aching). "Is it constant or intermittent?"
- "Does the pain radiate to any other body area?"
- "Has it ever moved from one area to another?"
- "Is there a way you can bring on the pain or relieve it?"
- "Is there anything that makes the pain worse?"
- "Does medication help to relieve it?"

PAST ILLNESSES

Next, the patient should be asked to describe any past illness, injuries or operations. This will help rule out certain conditions. For example, if he has an appendectomy (surgical removal of the vermiform appendix), then pain in the right lower quadrant of the abdomen cannot be acute appendicitis. Or an illness may be a recurrence. If he has been hospitalized in the past for a duodenal ulcer and now comes in with burning mid-upper abdominal pain that is relieved by antacids and milk, then he is probably having pain from a recurrent ulcer. Previous diagnoses should be kept in mind, such as diabetes or high blood pressure; these conditions may get worse during an illness and cause complications. The patient should be asked if he is allergic to any drugs, or if any drugs have ever made him ill.

REVIEW OF BODY SYSTEMS

When the diagnosis is not obvious or complete and if time permits, a general review of the various body system and associated symptoms may be helpful.

The patient should be asked if he now has any if the following things to report.

REVIEW OF BODY SYSTEMS

When the diagnosis is not obvious or complete and if time permits a general review of the various body systems and associated symptoms may be helpful.

The patient should be asked if he now has any of the following things to report.

Head	History of wound (trauma) severe headaches.
Eyes	Blurred vision, double vision, pain, yellow colour of the sclera (white part of the eye), pain on looking at light.
Ears	Loss of hearing, severe dizziness, pain, or drainage.
Nose	Bleeding, runny, or stuffy.
Mouth	Stiffness, enlarged glands, tenderness.
Respiratory	Cough abd character of material coughed up, coughing up blood, chest pain when breathing, shortness of breath.
Cardiac	Pain in middle of chest, swelling of both legs, shortness of breath on exercising or when sleeping flat in bed, forceful or rapid heart beat, history of high blood pressure, heart attack, history of rheumatic fever.
Gastro-intestinal	Poor appetite, indigestion, nausea, vomiting, diarrhea, constipation, jaundice, pain in stomach, flood in stool or in vomit.
Genito-urinary	Pain when urinating, pain in middle of back, frequent urination, straining to urinate, blood or pus in urine, discharge from penis.
Neurological	Paralysis or severe weakness of a part of the body (an arm or leg), convulsion, or seizure.
Family and social history	The patient should be asked if other members of his family have ever suffered from diabetes, tuberculosis, heart disease, cancer, or other disease that may now be appearing in the patient. Also ask about the amount of alcohol and tobacco the patient uses. The date of his last drink should be noted if chronic alcoholism is suspected, because delirium tremens may start 5-7 days after a patient stops drinking.

PHYSICAL EXAMINATION

This is the second basic part of the evaluation of the patient. By this time, some observations will have been made on such factors as the patient's speech, general

appearance, and mental status. Now, another system of collecting information, based on observation of definitive signs of disease, must be used.

To carry out a basic examination, it is necessary to have a clock or watch with a secong hand, blood pressure apparatus, a stethoscope, a thermometer, and a quiet room.

Vital signs	➢ What is the blood pressure? ➢ What is the pulse rate? ➢ What is the patient's temperature?
General appearance	➢ Note the position of the patient's body and his facial expression. ➢ Is he tense, restless, or in an unusual posture? Note his general ability to move and respond.
Skin	➢ Note location of rashes or sores. ➢ Is the rash red, made up of small or large spots? Are the spots separated, or do they run together? Do they itch? Are they elevated or flat? ➢ Is the skin hot and dry, or cold and wet? ➢ What is the colour of the skin? Is there evidence of jaundice (yelowness)? ➢ Are the lips and nailbeds a dusky blue colour or are they pale and white?
Head	➢ Is there evidence of trauma, such as a cut, bruise, or swelling?
Eyes	➢ Is there evidence of jaundice or inflammation in the sclera (white part of the eye)? (check for jaundice in the sunlight, if possible; in many normal people, there is a slight yellow cast of the sclerae in artificial light.) ➢ Can he move both eyes together up and down, and to each side? ➢ Are the pupils the same size? Do they get smaller when a light is shone into the eyes? (this is a normal reaction.)
Ears	➢ Check for blood in the ear canal, especially if a blow to the head is known or suspected.

Nose	➢ Look for bleeding or abnormal discharge.
Mouth and throat	➢ Are the gums swollen or extremely red? ➢ Are the colour and movement of the tongue unusual? ➢ Does the throat have abnormal redness, swelling, or ulcerated patches? ➢ Observe the patient swallow. Does he have difficulty swallowing? ➢ Note any abnormal odour to the breath.
Neck	➢ The patient should be asked to lie down and the examiner's hands placed behind the patient's head. When he is relaxed, the head should be lifted gently, bending the neck so that his chin will touch his chest. Observe for (1) an unnatural stiffness of the neck, or (2) discomfort when the legs are lifted from the table with the knees straight. ➢ Check for any enlarged glands on the side of his neck. Note if they are tender, movable, soft, or hard.
chest	➢ The patient's breathing should be observed. Note if it is painful and if both sides of the chest move together. ➢ Note if he has to sit to breathe. ➢ A stethoscope should be used to listen to all areas in the front and back and compare each side.
abdomen	➢ Look at the contour. Is it symmetrical? ➢ Ask about any scars. They may indicate previous surgery and rule out certain diseases.
Genitalia	➢ Check for sores, as in syphilis, being careful not to touch any. ➢ Is there any discharge from the penis? ➢ Check the testicle for swelling and tenderness.

	➢ Check the groin for swollen glands and for hernia (rupture).
Arms and legs	➢ Check for movement and strength of all parts. Is there any weakness or paralysis? (if the patient is unable to move his leg, for example, find out if it is due to pain, or if it truly is paralysis, which usually cause no pain.) ➢ Check for swelling and for tenderness. Is one leg or arm affected, or are both?
Back	➢ Is there tenderness or deformity? ➢ The kidney area should be tapped gently with the first to check for tenderness. This area lies in the back on either side of the spine and between the top of the pelvic bone and last rib.
Nervous system	➢ Does the patient show abnormal concern about his illness? ➢ Note general mental status. Is he rational? Is his behavior abnormal? Can he remember today's date and do simple arithmetic? ➢ Are his coordination and gait normal? As a test, have the patient take a few steps and pick up with each hand an object from a table or chair. If the patient is too ill to walk, note how he moves, turns over, and picks up objects in bed.

SYMPTOMS AND SIGN

The examiner's observation of the patient should begin at the head and proceed systematically to the feet.

After the examiner has obtained all the required information, it must be sorted and rearranged in different ways if it is to make sense. Related things must be brought together. A recommended way of organizing the information when asking for medical advice is described section 9.

DRAWING CONCLUSIONS

Write down the main complains, note the body systems that might be involved, and ask mire detailed questions about the symptoms. The physical examination may be performed again, and note taken of the body system affected by the abnormal findings. If necessary, ask further questions or reexamine areas that will help to clarify the findings. Often by a process of elimination, the problem will be reduced to a few possible diagnoses. At this point, if a definitive diagnosis cannot be made, knowledge of the case will be sufficient for presentation by radio to a physician.

Body discharges such as vomit, faeces, sputum, and urine should be examined carefully for abnormal colour, consistency, and above all presence of blood. Blood in the faeces may be bright red, dark brown, or the colour of tar. Blood in the urine is usually red in colour; but the urine may have to settle for several hours before blood can be seen. If the patient appears jaundices, his urine will usually be dark yellow in colour. To confirm a jaundiced condition, the urine should be put into a small bottle and shaken vigorously. In kaundice condition the foam will be yellow; normally it is white. Comparison can be made with a normal urine specimen.

Two important final points: first, when in doubt, always compare the physical finding on a patient with those for a normal person; or compare corresponding left and right parts the eyes or ears, in the same patient. Second, continue to observe and recheck the patient for things that may have been missed. Avoid a quick decision or diagnosis. Snap decisions might be wrong.

Note on malingering

Malingering is feigning illness to a void work or to gain some personal advantage. The malingerer either has no disability or, if he has one, deliberately exaggerates its symptoms. In any suspect case, take a careful history and make a careful routine examination, which should include the temperature and pulse rate.

Treatment

If the diagnosis is not absolutely certain, as is likely, given the patient the benefit of the doubt and leave him till a doctor sees him. In the meantime, keep him strictly in bed on a light diet, see that he passes faeces regularly, and prohibit smoking and alcoholic drinks.

6.0 SPINAL INJURIES

What to do in the case of spinal injury

- Remember that in a patient whose spine is injured any movement, particularly extension of the neck, can cause permanent damage to the spinal cord.

- To move a patient with suspected spinal injury onto a stretcher, use the "log-rolling" maneuver: gently roll the patient onto the stretcher, keeping the patient's back and neck straight.

Suspect a spinal injury if the patient meets any one of the following conditions:

- ✓ is unconscious;
- ✓ has fallen from a height of more than five metres;
- ✓ has fallen on the head or heels;
- ✓ has been struck on the head or neck;
- ✓ has been rescued after diving into shallow water;
- ✓ cannot move the toes when asked to;
- ✓ complains of:
  - o neck pain; OR
  - o tingling or absence of sensation in the feet or legs.

- If any of the above conditions is met:
  - ✓ seek medical advice;
  - ✓ take particular care in handling and resuscitating the patient;
  - ✓ keep the patient's head, neck, and chest aligned;
  - ✓ use a spinal board and/or cervical collar, if available;
  - ✓ keep the patient horizontal during the rescue procedure in order to minimize the consequences of low blood pressure, which is common in spinal injury.

How to apply the recovery position

- Use the recovery position for unconscious patients who are breathing and whose heart is beating: it prevents the tongue from blocking the airway and promotes drainage of fluids (blood or vomit) from the mouth, thereby reducing the risk of choking.
- Make sure there are no pillows under the patient's head.
- Kneel at the side of the patient.
- Remove any fragile or potentially dangerous objects, such as glasses and loose-fitting dentures.
- Straighten the patient's legs.
- Take the patient's arm that is nearest to you and place it at right angles to the body, with the elbow bent and the hand with the palm facing up.
- Take the patient's other arm and place it across the chest so that the hand rests palm down on the cheek nearest to you.
- Place one of your hands on the patient's far shoulder, keeping the patient's hand on the cheek, and with your other hand grasp the patient's far leg just above the knee and roll the patient towards you.
- Adjust the patient's upper leg so that both the hip and the knee are bent at right angles.

- Tilt the head back to make sure the airway remains open: use minimal tilt if you suspect a spinal injury.
- If necessary, adjust the position of the patient's hand under the cheek to keep the head tilted.
- Check regularly for breathing.
- Check blood circulation in the lower arm.
- To prevent bedsores, from time to time turn the patient gently onto the opposite side.
- After 12 hours of unconsciousness, administer fluid intravenously.
- Check now and again to ensure that all limbs are in mid-position – neither completely straight nor fully bent.
- Check that the eyelids remain closed at all times: if not, tape them shut to avoid damage to the eyeballs.
- Every two hours moisten the eyes with saline solution (0.9% sodium chloride) by opening the eyelids slightly and letting some saline solution drip gently into the corner of each eye.
- Every three hours moisten the mouth, cheeks, tongue, and teeth with a small swab moistened with water.

What not to do when rescuing an unconscious patient

DO NOT LEAVE THE PATIENT ALONE.
DO NOT ALLOW THE PATIENT'S HEAD TO BEND FORWARDS with the chin sagging.
DO NOT FORGET TO CHECK REGULARLY FOR BREATHING.
DO NOT PULL, STRAIN, OR STRETCH ANY JOINTS.
DO NOT GIVE ANYTHING BY MOUTH.

7.0 BURNS, SCALE AND EFFECT OF HEAT AND COLD

CLOTHING ON FIRE

What to do

- Tell the victim to close the eyes immediately and use a dry-powder fire extinguisher (colour-coded red in many countries) to put out the fire.
- after the fire is extinguished, have the victim wash out any powder that has entered the eyes.
- If a dry-powder extinguisher is not available, lay the victim down and smother the flames by wrapping the victim in any available material; OR
- throw bucketfuls of water over the victim; OR
- use a hose, if available, to douse the victim.
- Make sure all smouldering clothing is extinguished.

What not to do

- Do not use a carbon dioxide extinguisher (colour-coded black in many countries), unless nothing else is available: the gas can suffocate the patient:
- if you must use a carbon dioxide extinguisher, get the victim away from the gas cloud as soon as the fire is out.

HEAT BURNS AND SCALDS

The treatment of burns and scalds is generally the same, whether the cause is dry or wet heat, electricity, or chemicals. With electrical burns, there may be only a small burn on the skin surface but extensive damage to underlying tissue.

Note

Skin has an outer layer (epidermis) and a deep layer (dermis). The dermis contains sweat glands, hair follicles, and nerves relaying sensation and pain to the skin.

The most important questions to consider in a burn injury are:

- How deeply does the burn go into the skin?
- How extensive is the area of skin affected by the burn?

Burns generally cause loss of fluid from the body:

- the fluid lost is plasma (the pale-yellow liquid part of blood);
- generally, the more extensive the burn (as distinct from its depth), the greater the fluid loss and the more severe the degree of shock.

- A standard method of estimating the surface area affected by a burn is the "rule of nines" For children (not babies), the percentage for the head should be doubled and 1% taken off each of the other areas.

How to determine the severity of a burn:

First-degree burn:

- skin level:
  - outer skin layer (epidermis);
- signs and symptoms:
  - redness which turns pale on pressure
    mild swelling, tenderness, pain;
- outcome:
  - heals in three to seven days without scarring.
  - Second-degree, or partial-thickness, burn:

- skin level:
  - deep skin layer (dermis).

Superficial second-degree burn:

- signs and symptoms:
  - pain
  - tenderness to pressure and to air blown on the skin
  - redness
  - "weeping" burn area
  - burn area turns pale when pressed
  - blisters;
- outcome:
  - Heals in 7–21 days, usually without scarring.
- Deep second-degree burn:
  - at first hard to distinguish from third-degree burn (see below);
- signs and symptoms:
  - pain, possibly severe, from damage to nerve endings
  - tender only to pressure and not to air blown on the skin
  - extensive blisters, which burst readily
  - burn areas weeping or waxy
  - burn areas dry, red or pale
  - red areas do not turn pale when pressed;
- outcome:
  heals in weeks to months
  scarring often severe.

Third-degree, or full-thickness, burn:

- skin layer:
  - entire thickness of skin
- may extend to underlying fat, muscle, and bone; signs and symptoms:
  - skin possibly charred black or dark brown
  - skin leathery or white
  - usually no pain (nerve endings destroyed);
- outcome:
  - untreated, will never heal
  - treated, usually with skin grafting, will heal within weeks to months
  - scarring always severe.
- What not to do

- Do not treat a patient with a burn if you have any doubts about whether

➢ you can or should:

- less than perfect care can worsen the outcome;
- seek medical advice immediately.

➢ Do not treat a burn patient on board who:

has any other injury; OR

is a baby or a child or older than 50; OR

has a burn on the face, hand, foot, groin, genitals, or anus; OR

has a burn lying across a large joint; OR

has a burn going all the way around a limb.

What to do

_____ Seek medical advice in all cases expect for small superficial burns.

_____ You may be able to treat on board:

a partial-thickness burn in:

• an adult patient under 50 years of age;

• whose burn covers less than 15% of the total body surface area;

FLUID LOSS

The fluid lost in burns is the colourless liquid part of the blood (plasma). The degree of fluid loss may be determined more by the area of the burn than by is depth. The greater the plasma loss, the more severe the degree of shock.

Further, owing to loss of plasma, the remaining blood is “thicker” and more difficult to pump blood is “thicker” and more difficult to pump around the body, throwing extra strain on the hearth.

AREA OF BURN: THE RULE OF NINES

A recognized method of calculating the surface area of the body is the “rule of nines”. In children (not babies), the percentage for the head should be doubled and 1% taken off the other areas.

Treatment

Try to remove patient to hospital within 6 hours, otherwise seek RADIO MEDICAL ADVICE in the case of:

- Third-degree burns;
- Babies;
- Burns of face and genitalia, and large burns around joints;
- Burns of over 18% of the body surface in adults, or 10% in children or older persons.

Pending his removal to hospital, put the patient to bed and seek to restore the fluid balance by encouraging him ot drink as much as possible. Give him oral rehydration salts solution to drink. If vomiting occurs and persists, intravenous infusion of 0.9% (9 g/litre) sodium chloride may be necessary, after receiving RADIO MEDICAL ADVICE. Relieve pain and start the standard antibiotic treatment. Anxiety may be relieved by giving 5 mg of diazepam, repeated every four hours.

Less serious cases can be treated aboard ship.

First assemble:

- A plentiful supply of soap, boiled warn water, and cotton swabs;
- At least two sets of sterile scissors and forceps;
- Sufficient petrolatum-gauze burn-and-wound dressing to cover and overlap the cleansed burned areas;
- Sterile gauze and cotton wool to go on top of the dressings as padding.
- Elastic net bandages or tubular dressing;
- A face mask for each attendant.

Wash your hand and forearms thoroughly and put on a face mask. Remove the first aid dressing to expose either a single burned area (in multiple burns) or a portion of a single burn, that is, a hand and forearm or a quarter of the back. The aim is to limit the areas of burned skin exposed at any one time to lessen both the risk of infection and the seepage of fluid. Clean the skin round the edges of the burn with soap, water, and swabs. Clean away from the burn in every direction. DO NOT use cotton wool or other linty material for cleaning, as bits of it are likely to be left in the burn.

Leave blisters intact, but clip off all the dead skin if blisters have burst. Flood the area with clean warm boiled water from a clean receptacle to remove debris. With a swab soaked in boiled warm water dab gently at any remaining dirt or foreign matter in the burned area. Be gentle as this will inevitably cause pain.

Next cover the burn with neomycin and bacitracin ointment, or the petrolatum – gauze dressing, overlapping the burn or scald by 5-10cm, according to its size. Now apply a covering of absorbent material to absorb any fluid leaking from the burn, layer of sterile gauze covered with a layer of sterile cotton wool. Hold this in place with a suitable bandage – tubular dressings or screpe bandages are useful for limbs, and elastic net dressing for other areas.

Thoroughly wash hands and arms before proceeding to deal as above with the remainder of large burn, or with another burn in the case of multiple burns. In more serious cases, start the standard antibiotic treatment.

Dressing should be left undisturbed for a week unless they become smelly or very dirty, or the temperature is raised. Re-dress areas as above. First – degree burns will usually heal in a week to ten days without scarring. Second-degree burns should heal with little scarring in about three weeks.

SPECIAL BURNS

Severe sunburn blistering should be treated as first-degree burn according to the area of the body involved. In mild cases, keep the patient out of the sun and apply calamine lotion or zinc ointment to the painful areas.

In cases of scalds and burns of the mouth and throat, wash out with water and give patient ice to suck.

Respiratory burns are caused by the inhalation of hot gases and of smoke. Burns round the mouth, nose, face, hair, and neck indicate the possibility of respiratory burns. Heat from a flash fire may also cause a burn-related swelling of the top of the throat, even though there is no sign of burn on the face.

A patient with a mild injury to the respiratory passage may have only a cough, hoarseness, or a sore throat. In more severe cases the patient may suffer from marked shortness of breath, persistent coughing, wheezing and hoarseness. In very severe cases, the respiratory passages may be blocked by a swollen throat and the lungs may partially collapse.

If the patient has difficulty in breathing, inset an airway. In any event, get RADIO MEDICAL ADVICE.

FROSTBITE AND HYPOTHERMIA

Frostbite and hypothermia are cold-related emergencies that may quickly become life or limb threatening. Preventing cold-related emergencies includes not starting an activity in, on, or around cold water unless you know you can get help quickly in an emergency. Be aware of the wind chill. Dress appropriately and avoid staying in the cold too long. Wear a hat and gloves when appropriate with layers of clothing. Drink plenty of warm fluids or warm water but avoid caffeine and alcohol. Stay active to maintain body heat. Take frequent breaks from the cold. Avoid unnecessary exposure of any part of the body to the cold. Get out of the cold immediately if the signals of hypothermia or frostbite appear.

Frostbite is the freezing of a specific body part such as fingers, toes, the nose or earlobes.

Signals of frostbite include:

lack of feeling in the affected area; skin that appears waxy, is cold to the touch, or is discolored (flushed, white or gray, yellow or blue).

What to do for frostbite:

1. Move the person to a warm place.
2. Handle the area gently; never rub the affected area.
3. Warm gently by soaking the affected area in warm water (100–105 degrees F) until it appears red and feels warm.
4. Loosely bandage the area with dry, sterile dressings.
5. If the person's fingers or toes are frostbitten, place dry, sterile gauze between them to keep them separated.
6. Avoid breaking any blisters.
7. Do not allow the affected area to refreeze.
8. Seek professional medical care as soon as possible.

Hypothermia is another cold-related emergencies. Hypothermia may quickly become life threatening.

Hypothermia is caused by the cooling of the body caused by the failure of the body's warming system. The goals of first aid are to restore normal body temperature and to care for any conditions while waiting for EMS personnel.

Signals of hypothermia include:

shivering, numbness, glassy stare; apathy, weakness, impaired judgment; loss of consciousness.

What to do for hypothermia:

1. Gently move the person to a warm place.
2. Monitor breathing and circulation.
3. Give rescue breathing and CPR if needed.
4. Remove any wet clothing and dry the person.
5. Warm the person slowly by wrapping in blankets or by putting dry clothing on the person. Hot water bottles and chemical hot packs may be used when first wrapped in a towel or blanket before applying. Do not warm the person too quickly, such as by immersing him or her in warm water. Rapid warming may cause dangerous heart arrhythmias. Warm the core first (trunk, abdomen), not the extremities (hands, feet). This is important to mention because most people will try to warm hands and feet first and that can cause shock

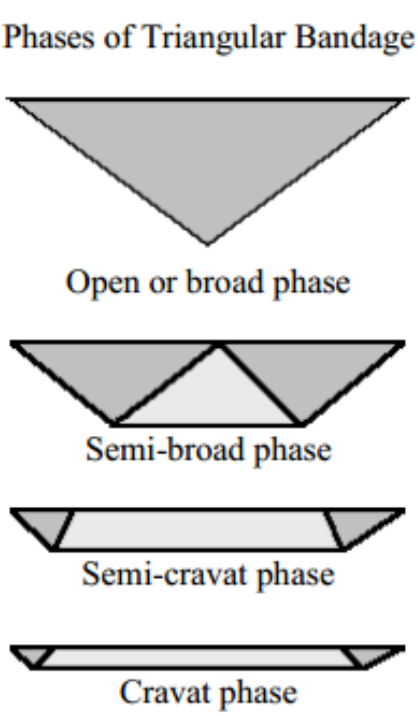
8.0 FRACTURES, DISLOCATION AND MUSCULAR INJURIES

The limbs are the most common site of injury. The injuries that you will encounter include bruising, sprains, strains, dislocations, fractures, avulsions, and crush injuries. Limb injuries, even when severe, are not directly life threatening unless associated with uncontrolled bleeding, therefore your priority is the control of bleeding and the prevention of further injury.

BANDAGING

Bandaging in first aid should be kept simple and practical. There is little point in splinting a fractured leg with triangular bandages and wood if the ambulance service is going to be on the scene within an hour. They will use traction splints and therefore they will remove any splinting applied by the first aider.

The most useful bandage in the first aid kit is the triangular bandage. It can be used to make a variety of slings, it can be used as a bandage to hold splints on the body and it can be used as a pad and bandage for bleeding. The triangular bandage can be folded as follows:



Folding a triangular bandage to create broad and narrow bandages

Folding narrow bandage for storage

BRUISING

Bruising on a limb may range from a small dark spot to a large area. The extent of the injury depends on the damage to the tissues and blood vessels within the limb. Severe bruising can also occur where a small injury occurs but the casualty has a blood clotting disorder or they are taking anti-clotting medication. These casualties need to be monitored and if the bruise becomes large they should be taken to hospital or to their medical practitioner.

TREATMENT OF BRUISING

1. Approach incident -Check casualty's medical history and examine injury
2. Rest the casualty and the injured area
3. Ice compress on the bruise for 10 minutes
4. Compression bandage
5. Elevate Injured limb
6. If necessary send to medical practitioner - beware of anti-coagulant drugs

SPRAIN AND STRAIN

Sprains and strains are over-stretching and tearing injuries. Sprains occur when the ligaments which bind joints are torn or over-stretched: strains occur in muscles.

It is sometimes difficult to tell the difference between a severe sprain and dislocation or fracture involving the joint. If you are in doubt treat the injury as a fracture

PROVISIONAL DIAGNOSIS OF SPRAIN AND STRAIN

HISTORY

a. Story of playing sport or physical exertion
b. Patient has over-extended or twisted
c. Patient may have felt or heard a snap before pain

SIGNS

a. Swelling
b. Bruising
c. Unable to bear weight or use limb

SYMPTOMS

a. Pain

b. Tenderness

TREATMENT OF SPRAIN OR STRAIN

1. Approach incident
2. Take history and examine injury
3. Rest the casualty and the limb
4. Ice compress applied to injury for 20 minutes
5. Compression bandage
6. Elevate Injured limb
7. If you think there may be a fracture/dislocation treat for that injury

Application of a compression bandage to ankle

FRACTURE

THERE ARE THREE GENERAL CAUSES OF FRACTURES

Direct Force: - a blow to the body breaks the bone directly where the blow is made

Indirect Force: - the force of a blow or impact to the body travels along the body and fractures a bone further away

Abnormal Muscle Action: - severe muscle contraction can sometimes break bone

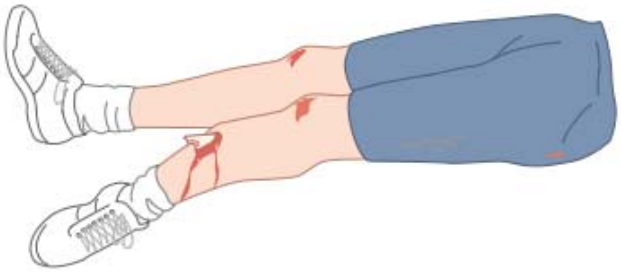
The line of the bone fracture may be:

- Transverse: Forms a right angle with the axis of bone.
- Oblique: Runs slanted to the axis of the bone.
- Longitudinal: Runs along the line of its axis.

A fracture is a break in the continuity of a bone and there are three basic types of fracture:

- CLOSED

A closed fracture is where the bone is broken and there is no opening to the exterior through a wound and no injury to other body organs.



Open fracture of left leg

- OPEN

An open fracture is where the ends of broken bone are exposed to the air either after they are pushed through the skin or a wound leads down to the bone. An open fracture is serious because of associated bleeding and the increased risk of infection entering the bone itself.

- COMPLICATED

A complicated fracture is where other body organs are damaged by the fracture.

DISLOCATION

Dislocation occurs when a bone is moved out of place by forces twisting or pulling it. The treatment of dislocations and fractures is the same

PROVISIONAL DIAGNOSIS OF DISLOCATION AND/OR FRACTURE

HISTORY

a. Story of a blow or other impact to the body

b. Patient engaging in physical exertion

SIGNS

a. Abnormal or no movement
b. Deformity - (sometimes)
c. Swelling
d. bruising
e. Shortening of limb (Legs)
f. Crepitus - a coarse grating sound which should be prevented

SYMPTOMS

a. Loss of power, movement or control
b. Pain
c. tenderness

GENERAL TREATMENT OF DISLOCATIONS AND FRACTURES

1. Approach incident
2. Take history and examine injury
3. If necessary call ambulance immediately
4. Rest the casualty and the limb
5. Check circulation below injury (pulse and skin)
6. If ambulance will be some time in arriving apply bandage
   - ✓ around feet or hand
   - ✓ above the fracture
   - ✓ below fracture
   - ✓ to the joint above the fracture
   - ✓ to the joint below the fracture
7. Tie all knots over padding or splints
8. Check circulation below bandages

TREATMENT OF SPECIFIC FRACTURES

USE OF SPLINTS

The treatment of fractured legs using wooden splints is not recommended where an ambulance will be at the scene within a reasonable period of time, say an hour or so.

Wooden splints are also not recommended because they are:

a. hard to find at accidents,
b. they will cause pressure sores if not properly padded,
c. they are painful to apply, and
d. the ambulance officers will have to remove them to use their equipment

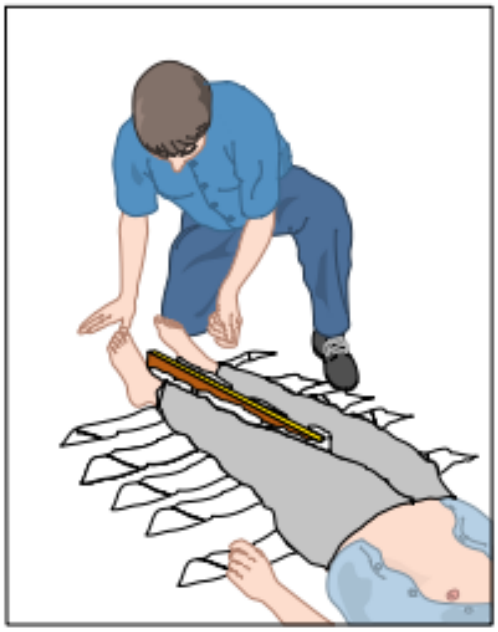
O'Hare Traction splint is a special splints used by ambulance officers for lower limb fractures

TREATMENT OF FRACTURED LEG WHERE AMBULANCE IS QUICKLY AVAILABLE

1. Approach incident
2. Call ambulance immediately
3. Check circulation below injury (pulse and skin)
4. Reassure and talk to casualty constantly
5. If the casualty experiences severe muscle spasm
   - ✓ reassure casualty and get them to relax muscles
   - ✓ take hold of foot of injured limb and
   - ✓ gently pull on foot and stretch muscles
   - ✓ straighten limb
   - ✓ hold limb until ambulance arrives (this is very strenuous and cannot be done for a prolonged period by one person)
6. Continuously check circulation below any bandages

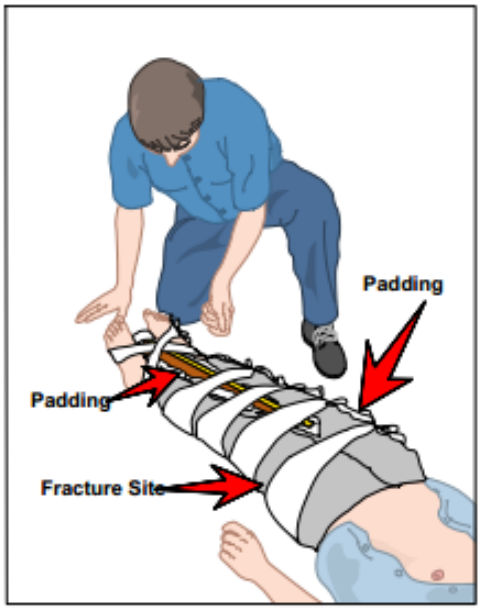
TREATMENT OF FRACTURED LEG WHERE AMBULANCE IS NOT AVAILABLE

1. Approach incident
2. Call ambulance immediately
3. Check circulation below injury (pulse and skin)
4. Obtain materials for splinting and bandaging
5. If the casualty experiences severe muscle spasm
   - ✓ talk to and reassure the casualty constantly
   - ✓ take hold of foot of injured limb and
   - ✓ gently pull foot down from hip
   - ✓ straighten limb
   - ✓ hold limb



Place bandages, splint and padding

6. Place bandages and then splint between legs and pad heavily



Tie knots on uninjured side over padding

7. Apply bandages
   - ✓ figure narrow bandage around feet
   - ✓ broad bandage above the fracture
   - ✓ broad bandage below fracture
   - ✓ broad bandage to the joint above the fracture
   - ✓ broad bandage to the joint below the fracture

- ✓ Tie all knots over padding

8. Frequently check circulation below bandages
9. Reassure casualty and treat poor perfusion

TREATMENT OF FRACTURED PELVIS

1. Approach incident
2. Take history and examine injury
3. Call ambulance immediately
4. Rest the casualty
5. Treat for poor perfusion (Shock)
6. Padding between legs
7. Apply bandage
   - ✓ narrow bandage around feet or hand
   - ✓ broad bandage to the knee joint
8. Tie all knots over padding
9. Prop casualty up very slightly
10. Place rolled blanket or pillow under knees
11. Check circulation below bandages
12. Check perfusion status (shock)

TREATMENT OF FRACTURED LOWER ARM

1. Approach incident
2. Take history and examine injury
3. Rest the casualty and the limb
4. Check circulation below injury (pulse and skin)
5. Find splint -newspaper is good -and pad it well
6. Apply splint and padding under arm

Newspaper used as splint for forearm fracture

7. Apply narrow bandages
   - ✓ around hand
   - ✓ above the fracture

- ✓ below fracture

8. Tie knots on splint
9. Apply Ordinary arm sling
10. Check circulation below bandages

TREATMENT OF FRACTURED UPPER ARM

1. Approach incident
2. Take history and examine injury
3. If necessary call ambulance immediately
4. Rest casualty and the limb
5. Check circulation below injury (pulse and skin)

Application of ordinary arm sling

6. Apply Collar and Cuff sling
7. If casualty has to move over rough ground apply padding under arm
8. Two broad bandages around arm
   - ✓ one above fracture
   - ✓ one below fracture
9. Check circulation below bandages

AVULSION

Avulsion is the non surgical amputation of a limb or other body part. In most avulsion cases the limb or body part is torn and twisted off the body. Even with apparently clean cuts there is usually some degree of crushing and tearing of the tissues around the site of the wound. Because of the tearing, stretching and mashing of tissues and blood vessels, avulsion can sometimes be accompanied with severe uncontrolled bleeding

TREATMENT OF AVULSION

1. Approach incident
2. Take history and examine injury
3. Rest the casualty and the limb
4. Immediately call ambulance
5. Control haemorrhage -pack stump or hole with towels etc
6. Elevate Injured limb
7. Find avulsed part and wrap in and seal in plastic, then wrap with a dry towel
8. Place wrapped part in ice

CRUSH INJURIES

With crush injuries the weight must be left in place until the arrival of the ambulance if casualty has been trapped for more than an hour. This prevents the chemicals from burst cells from reaching the heart and stopping it.

TREATMENT OF SERIOUS CRUSH INJURY

1. Approach incident
2. Remove weight if possible (Do not remove weight if trapped for more than an hour)
3. Immediately call ambulance
4. Control any Haemorrhage
5. Immobilise limbs
6. Elevate legs if possible
7. Rest and reassure the casualty
8. Treat poor perfusion

9.0 MEDICAL CARE OF RESCUED PERSONS, INCLUDING DISTRESS, HYPOTHERMIA AND COLD EXPOSURE

MEDICAL CARE OF CASTAWAYS AND RESCUED PERSONS

- Abandonment of vessel

Lifeboat drills must be conducted to prepare for possible disaster. Both crew and passengers must be instructed in procedures to be followed. Reasons for such instruction should be given to all concerned, because procedures will be remembered better when the necessity for them is understood.

Forced immersion is the primary hazard to lifeafter surviving the initial impact of hitting the water. It should be kept in mind that no ocean or lake has a temperature equal to body temperature. Thus, in all latitudes, anyone in open water will lose heat, and heat loss lower

the internal body temperature. As the internal body (core) temperature falls below normal and generalized hypothermia develops there is an increasing likelihood of ventricular fibrillation and cardiac arrest.

The loss of body heat is one of the greatest hazard to the survival of a person in the sea.

The extent to which generalized hypothermia threatens life is determined by the water temperature and the length of exposure. The bodily effect of subnormal temperature will vary depending on geography, season, duration and activity in the water, and body insulation (the amount of fatty tissue and clothing of the individual).

Practical hints for people forced to abandon ship have been published in a pamphlet distributed by the International Maritime Organization.[1] This pamphlet should be available on board ship, and should be used for training the crew.

These hints, aimed at increasing the chances of survival in cold water following disaster at sea, are reproduced below:

1. Put on as much warm clothing as possible, making sure to cover head, neck, hands and feet.
2. If an immersion suit is available put it on over the warm clothing.
3. If the immersion suit does not have inherent flotation, put on a life-jacket and be sure to secure it correctly.
4. Anyone who knows that he is likely to be affected by seasickness should, before or immediately after boarding the survival craft, take some recommended preventive tablets or medicine in a dose recommended by the manufacturer. The incapacitating effect of seasickness interferes your survival chances; the vomiting removes precious body fluid, while seasickness in general makes you more prone to hypothermia.
5. Avoid entering the water if possible, e.g., board davit-launched survival craft on the embarkation deck. If davit –launched survival craft are not available, use over-side ladders, or if necessary lower yourself by means of a rope or fire hose.
6. Unless it is unavoidable, do not jump from higher than 5 metres into the water. Try to minimize the shock of sudden cold immersion. A sudden plunge into the cold water can cause rapid death or an uncontrollable rise in breathing rate that may result in an intake of water into the lungs. If it is absolutely necessary to jump into the water, you should keep your elbows to your side and cover your nose and mouth with one hand, while holding the wrist or elbow firmly with the other hand. Do not jump into the water of lift-raft in case there is any remaining headway on the ship.
7. Once in the water, whether accidentally or as a result of abandoning ship, orientate yourself and try to locate the ship, life-boats, life-crafts, other survivors, and other floating objects. If you were unable to prepare before entering the water, button up clothing at this point. In cold water, you may experience violent shivering and great pain. These are natural body reflexes that are not dangerous. You do,

[1] International Maritime Organization. A pocket guide to cold water survival. London, IMO,1982.

however, need to take action as quickly as possible before you lose full use of your hands; button up clothing, turn on signal lights, locate whistle, etc.

8. While afloat in the water, do not attempt to swim unless it is to reach a nearby craft, a fellow survivor, or a floating object on which you can lean or climb. Unnecessary swimming will "pump" out any warm water between your body and the layers of clothing, thereby increasing the rate of body-heat loss. In addition, unnecessary movements of your arms and legs send warm blood from the inner core to the outer layer of the body. This results in a very rapid heat loss. Hence, it is most important to remain as still as possible in water, however painful it may be. Remember, pain will not kill you, but heat loss will.
9. The position you assume in the water is also very important in conserving heat. Float as still as possible with your legs together, elbows close to your side, arms folded across the front of your life-jacket. This position minimizes the exposure of the body surface to the cold water. Try to keep your head and neck out of the water.
10. Try to board a lifeboat, raft, or other floating platform or object as soon as possible in order to shorten the immersion time. Remember, you lose body heat many times faster in water than in air. Since the effectiveness of your insulation is seriously reduced by soaking in water, you must now try to shield yourself from wind to avoid a wind-chill effect (convective cooling). If you manage to climb aboard a lifeboat. Shielding can be accomplished with the aid of a canvas cover or tarpaulin, or an unusual garment. Huddling close to the other occupants of the lifeboat will also conserve body heat.
11. Keep a positive attitude of mind about your survival and rescue. This will improve your chances of extending your survival time until rescue comes. Your will to live does make a difference.
12. DO NOT DRINK ALCOHOL BEFORE ABANDONING SHIP. It is dangerous it not only cause rapid heat loss, but also impairs judgment.

SURVIVOR PICK-UP BY SURVIVAL CRAFT (LIFEBOAT OR RAFT)

Surviving in a lifeboat or life-craft (hereafter referred to as "the survival craft") is one of the most strenuous ordeals an individual can face. It involves combat against all the elemental forces at sea of all –fear, hysteria, and despair. Thus before survivors are picked up, or as soon as immediate rescue operations have been complete, a firm chain of command, based on previous positions of authority, must be established aboard the vessel. The individual in command of a survival craft is responsible for the immediate welfare (physical safety, medical condition, and morale) of its crew, as well as its other occupants.

When injury to a survivor is suspected, the methods used in transferring him to the survival craft should be the same as those outlined in the general first aid instructions.

The captain of the survival craft must be the one to decided how long artificial respiration on conscious victims should continue; how food, water, and medical supplies are distributed; and when to signal for help.

IMMEDIATE MEDICAL PROBLEMS ABOARD SURVIVAL CRAFT

The first objective in caring for any injured person is to provide life-saving treatment. Without equipment this may be accomplished by:

- Controlling hemorrhage with direct pressure;
- Giving mouth-to-mouth respiration when needed;
- Treating absence of pulse or cardiac stoppage by heart compression
- Treating shock by placing a survivor's head lower that the rest of his body , and keeping him warm
- Treating factures by strapping the extremity to the opposite, if nothing is available that can be used for splinting (for example, splint one leg to the other, one arm to the chest, or one forearm to the other with hands touching elbows

PERSONS RESCUED FROM DROWNING

Those rescued promptly from drowing usually recover spontaneously if they have not recover spontaneously, if they have not spent too much time in cold water and their body temperature has not been abnormally lowered.

TREATMENT

Treatment for persons who have almost drowned should consist of immediate mouth-to-mouth artificial respiration, and heart compression, if needed.

If the person has trouble breathing, mouth-to-mouth artificial respiration may be helpful, even though he is breathing on his own. Efforts to drain water from the lungs of those rescued from drowning are not generally indicated or helpful, and should not be attempted. However, victims tend to swallow large volumes of water and their stomachs may become distended. This distension impairs ventilation and circulation, and it should be alleviated as soon as possible.

The water may be forced out and distension relieved by turning the victim on his side and compressing the upper abdomen. Also, the victim may be turns over into a face-downwards position and lifted under the stomach with the rescue's hands to force the water out.

GENERALIZED HYPOTHERMIA DUE TO IMMERSION

As already mentioned, generalized hypothermia is the leading cause of death among shipwreck survivors.

In a cold environment, body-heat production will automatically increase in an effort to balance heat loss. But, if the rate of heat loss exceeds the rate of heat production, the body temperature must fall and hypothermia will result.

Generalized hypothermia commonly occurs in most survivors extracted from cold water. The victims are strikingly pale, frequently have generalized, muscular rigidity, are shivering, and exhibit varying levels of consciousness and shock. In addition, death by drowning is a frequent consequence of weakness caused by hypothermia, supervening before death from hypothermia alone would have occurred.

Treatment

The treatment for hypothermia will depend on the condition of the survivor. Generally speaking, survivors who are rational and capable of recounting their experience, although shivering dramatically, merely need to have all their wet clothes removed and replaced with dry clothes or blankets. However, always bear in mind that even conscious survivors can collapse and become unconscious shortly after rescue. Alcohol should be avoided at all costs.

In more serious cases, in which the survivor is not shivering and is semi-conscious, unconscious, or apparently dead, immediate first aid measures will be necessary to preserve life. The following measures are recommended for dealing with such a survivor:

- On rescue, always check the survivor's breathing.
- If the survivor is not breathing, ensure that the airway is clear and start artificial respiration immediately (mouth-to-mouth or mouth-to-nose).
- Attempts at providing basic life support should be continues for at least 30 minutes (if medical advice is not available).
- If the survivor is breathing but unconscious, lay him in the unconscious position. This is necessary to ensure that his breathing is not obstructed by his tongue or by vomit.
- Avoid all unnecessary manhandling; do not even remove wet clothes; do not massage.
- Prevent further loss of heat through evaporation and from exposure to the wind. Wrap the patient in blankets. Preferably keeping him horizontal with his head slightly down.

EMOTIONAL FACTORS

Under ideal conditions the healthy uninjured person may be able to survive 3 days at sea in a lifeboat or raft. However, survival for more than a month is not uncommon. The single most important factor in castaway survival is the will to live. This has been proved time and again in sea disasters and "ditchings". Often survivors have made every mistake in the book, but were saved by their determination to live.

The actions and emotional of the castaways depend first upon the morale and psychological strength of both the group and the individual. A group of experienced seamen, for instance, will be psychologically stronger than a group of shocked passengers.

As time is spent on the survival craft awaiting rescue, the group's morale may weaken seriously. Keeping survivors active is important. An assignment to various tasks nursing care, supply tally, rescue watch, among other activities will divert and occupy the mind and may help to keep hopes high. Lone survivors should make every effort to converse energy and resources. They may imagine that they hear voices or see things that are not really there. Keeping the mind active with mental exercises may help to prevent this development.

Mental derangement may appear at any time before or after the rescue.

It is the duty of all survivors to recognize and treat mental disturbances, but the ultimate responsibility rests with the captain of the survival craft. Anxiety is most contagious and can destroy chances of survival on the open sea.

The best treatment for anxiety is to reassure patient and other people in the lifeboat and assign small tasks to keep them occupied. Acute agitation should be treated promptly, as the situation demands. For some victims forcible restraint may need to be applied. Morphine sulfate, 10mg intramuscularly, repeated every 4 hours as needed, may serve to calm the anxious.

OTHER MEDICAL PROBLEMS ABOARD SURVIVAL CRAFT

SEASICKNESS

Seasickness (motion sickness) is an acute illness characterized by loss of appetite, nausea, dizziness, and vomiting. Preventive measures are often effective.

SUNBURN

Sunburn is one of the principal medical hazards of survival on the open sea, regardless of latitude. It may vary from a first – to a third-degree burn, depending upon the exposure and the protection available to the victim. Initially, sunburn is generally characterized by redness, oedema, and tenderness of the skin. It may be accompanied by local pain, fever, nausea, vomiting, diarrhea, weakness or even prostration.

Sunburn is prevented by keeping fully clothes at all times and, if possible, staying under a canopy. Survivors should avoid looking directly into the sun or at the glare from the water. Those aboard the survival craft should wear sunglasses during all daylight hours. In addition to these obvious precautions, a sun-screening agent should be applied liberally to all exposed parts of the body during periods of exposure to strong sunlight.

HYDRATION AND NUTRITION

If rescue is delayed, maintaining both hydration and nutrition aboard the survival craft will become progressively more difficult. Food supplies are less essential than water. Lifeboat stores are often limited to hard candy, which provides a small amount of energy. Its main value is in boosting the morale of hungry survivors.

Although survival craft carry a limited quantity of potable water, they may be equipped with desalting kits or a solar still which would provide additional drinking-water. Each desalting kit provide about half a litre of safe drinking-water. Although the water is likely to be acrid and discoloured, it is safe when prepare according to the instructions on the kit. The capacity of a solar still is limited; it will yield about 4 litres of water per day in temperate climates with sunlight. This distilled water looks and smells better than the water produced by desalination. Efforts should be made to store rainwater.

If it is likely that more than one day will pass before rescue, a minimal amount of water should be issued during the first 24 hours. This will allow survivors' bodies to activate water-saving mechanism that will later reduce the need for water. Survivors who have spent some time in the water, or who have smallowed seawater, may have a demanding thirst; this should be partially satisfied. After the first day, half a litre of water daily per person should be consumed. In tropical climates, if stores are adequate, the ration should be increased to compensate for excessive loss of water due to sweating.

HEAT EXPOSURE

Special problems are created aboard survival craft by exposure to tropical heat. In certain circumstances, fluid loss by sweating alone can be extremely high. The body will adjust to exceptional heat to some extent, but full acclimatization rarely occurs.

Dehydration can be prevent by minimizing activity during the daylight hours and by making the best use of clothing as a canopy.

Treatment for dehydration consists of increasing the water ration, as supplies permit.

Heat exhaustion is caused by a loss of body water and salt.

Heat cramps are painful spasms of the muscles of the extremities, back, or abdomen due to salt depletion. The skin is usually moist and cool, and twitching of muscles is frequent.

MEDICAL PROBLEMS OF THE RESCUED CASTAWAY ON BOARD THE RESCUE VESSEL

The treatment of survivors will depend on the nature of the rescue facility and the number and medical condition of the survivors.

Personnel on the rescue vessel should rapidly sort all survivors, according to their physical condition, into:

a. Those with minor injuries whose condition will not be worsened by delay in treatment (to be treated last or as time permits);
b. Those who are sick or injuried but potentially treatable with the facilities at hand.

The latter group includes those who urgently required medical attention. Some persons in this group may be given first aid and relegated to group (a). For example, a broken arm could be splinted quickly and set later, after more critical problems have been taken care of.

Victims rescued from drowning must receive immediate treatment.

Every submersion victim, even one requiring minimal treatment, should preferably be evacuated to a hospital for follow-up care.

COLD EXPOSURE INJURIES (LOCAL)

Cold injuries to parts of the body (face, extremities) are caused by exposure of tissue and small surface blood vessels to abnormally low temperatures. The extent of the injury depends upon such factors as temperature, duration of exposure, wind velocity, humidity, lack of protective clothing, or presence of wet clothing. Also, the harmful effects of exposure to cold are intensified by fatigue, individual susceptibility, existing injuries, emotional stress, smoking, and drinking alcohol.

Cold injuries to part of the body fall into three main categories: chilblains, immersion foot, and frost-bite.

CHILBLAINS

This relatively mind form of cold injury occurs in moderately cold climates with high humidity and temperature above freezing (0-16 ºC).

Chilblains usually affects ears, fingers, and the back of the hand; but they may affect the lower extremities, especially the anterior tibia surface of the legs.

They are characterized by the skin turning a bluish red and by a mild swelling often associated with an itching, burning sensation which may be aggravated by warmth. If exposure is brie, these manifestations may disappear completely with no remaining signs. However, intermittent exposure results in the development of chromic manifestations, such as increased swelling, further discoloration of the skin (which becomes a deep reddish purple), blisters, and bleeding ulcers which heal slowly to leave numerous pigmented scars.

Treatment. For skin discomfort, apply a bland soothing ointment such as petrolatum. People susceptible to chilblains should avoid the cold or wear woolen socks and gloves.

IMMERSION FOOT

This form of cold injury is caused by exposure of the lower extremities to water at above-freezing temperatures, usually below 10ºC, for more than 12 hours. It characteristically occurs among shipwrecked sailors existing on lifeboats or rafts in enforced inactivity, with a poor diet with wet and constricting clothing, and in adverse weather conditions, Clothing, and in adverse weather conditions. Clinical manifestations include swelling of the feet and lower portions of the leg, numbness, tingling, itching, pain, cramps, and skin discoloration.

In cases of immersion foot uncomplicated by trauma, there is usually no tissue destruction.

Treatment. After rescue every effort should be made to avoid rapid rewarming of the affected limbs. Care should be taken to avoid damaging the skin or breaking blisters. Do not massage affected limbs.

Prevention. Every effort should be made by survivors to keep their feet warm and dry. Shoelaces should be loosened; the feet should be raised and toe and ankle exercises encouraged several times a day. When possible, shoes should be removed and unwanted spare clothing may be wrapped round the feet to keep them warm. Smoking should be discouraged.

FROST-BITE

This is the term applied to cold injuries where there is destruction of tissue by freezing. It is the most serious from of localized cold injury. Although the area of frozen tissue is usually small, frost-bite, may cover a considerable area. The fingers, toes, cheeks, ears, and nose are the commonly affected parts of the body. If exposure is prolonged, the freezing may extend up the arms and legs. Ice crystals in the skin and other tissue cause the area to appear white or greyish-yellow in colour. Pain may occur early and subside. Often, the affected part will feel only very cold and numb, and there may be tingling, stinging, or aching sensation. The patient may not be aware of frost-bite until someone mentions it. When the damage is superficial, the surface will feel hard and the underlying tissue soft when depressed gently and firmly. In a deep unthawed frost-bite, the area will feel hard and solid and cannot be depressed. It will be cold and numb, and blisters will appear on the surface and in the underlying tissues in 12-36 hours. The area will become red and swollen when it thaws, gangrene will occur later, and there will be loss of tissue (necrosis). Time alone will reveal the kind of frost-bite that has been present. It is fortunate therefore that the treatment for various degrees of frost-bite is ite. Identical except for superficial frost-bite. **A frost-bite of the superficial, dry, freezing type should be thawed immediately to prevent a deep-freezing injury of the part involved. However, never thaw a frozen extremity before arriving at a facility with water, heat, and equipment where the extremity can be rewarmed rapidly.**

Treatment. All freezing injuries follow the same sequence in treatment: first aid, rapid rewarming, and care after first aid.

a. First aid. The principles of first aid in localized cold injury are relatively few. The two most important things are to get the patient to place of permanent treatment as soon as possible and then to rewarm him. It is important to note that a patient can walk for great distances on frost-bitten feet with little danger. Once rewarming has started ¡, it must be maintained. All patients with local cold injuries to the lower extremities become litter cases. Refreezing or walking on a partially thawed part can be very harmful. During transportation and initial treatment, the use of alcoholic drinks should not be permitted, because they affect capillary circulation and cause a loss of body heat. Ointments or creams should not be applied.
b. Repaid rewarming. The technique of rewarming has two phases: (1) treatment of exposure; and (2) treatment of the local cold injury. Treatment of exposure consists of actively rewarming the patient. This is done in principle by the removal of cold and the addition of warmth. Removal of cold is accomplished by removal of cold is accomplished by removal of all cold and wet clothing and constricting items such as shoes and socks. Addition of warmth is provide from external and internal sources. External warmth is added by providing the patient with prewarmed clothes and blankets. Giving a patient a cold change of clothes, a cold blanket, or a cold sleeping-bag will cause a rapid dissipation of his residual heat. If necessary, it would be better to have someone give the clothing he is wearing to the patient. Someone should warm the patient's sleeping – bag before gets into it. A good source of warmth is the body heat of other people. In general, internal warmth is provided by hot liquids and an adequate diet. There are two techniques of rapid rewarming: wet and dry.
Wet rapid rewarming, which is preferred, is accomplished by complete immersing the affected part in an adequate amount of water at a temperature of 40-42 ºC. The bath should be tested frequently with a thermometer. If one is not available, the attendant should pour some of the water over the inside of his wrist to make sure the bath is not too hot. Warming should be discontinued when the affected part becomes flushed; this is usually within 20 minutes. Further rapid wet rewarming is not necessary.
The dry rapid rewarming technique takes three to four times as long as the wet techniques and is best accomplished by the use of natural body warmth, for example, by putting the patient's hands in someone else's armpits or by sharing warm clothing with him. Also, the patient can be exposed to warm room air.

Do not make such a patient walk and do not massage the affected part. Do not use water hotter than 44 ºC, nor recool with ice or snow, and do not expose extremities near an open flame or fire.
(c) Care after first aid. After the rewarding of a cold injury to a lower extremity, the patient is treated as a litter case. All constricting clothing items should be removed, total body warmth should be maintained, and sleep should be encourage.

After rewarming, the affected part should be cleansed carefully with water, or soap and water, taking care to leave the blisters intact. A soft sterile dressing should be applied. Dry, sterile gauze should be placed between toes and fingers to keep them separated. The patient should be placed in bed with the affected part elevated and protected from contact with the bedding.

If available, a bed cradle can be used, or one can be improvised from boxes to keep sheets and blankets from touching the affected area. Additional heat should not be applied.

Morphine sulfate, 10 mg, may be given intramuscularly for pain and repeated every 4 hours a needed, but only if RADIO MEDICAL ADVICE recommends it.

GENERALIZED IMMERSION HYPOTHERMIA ABOARD THE RESCUE VESSEL

At environment temperatures of less than 20-21 ºC, man's survival depends upon insulation (body fat, clothing), the ratio of body surface to volume, the basal metabolic rate, and the will to survive.

Seawater freezes at - 2 ºC. It may be assumed that most polar water with ice is a cold as this. In polar water, the body temperature falls very rapidly. Consciousness lasts 5-7 minutes, the ungloved hand is unless in 1-5 minutes, and death occurs in 10-20 minutes. It has been found that severe exposure of the head and neck to cold can cause massive cerebral hemorrhage. These parts of the body should be specially protected.

The rectal temperature should be taken in people rescued from cold water. This can help in estimating the chance of survival in each individual case.

When the rectal temperature is below 35 ºC, hypothermia progressive lowers the basal metabolic rate, heart rate, and blood pressure and produces uncontrollable shivering. Hallucinations, apathy, and stupor or unconsciousness occur at 27-30 ºC; and death from ventricular fibrillation or cardiac arrest at 21-28ºC.

TREATMENT

The treatment of generalized (immersion) hypothermia begins with artificial respiration, using oxygen if available, unheated oxygen should not be used for the hypothermia victim, because it will mean added cold; warm, moist oxygen should therefore be administered. An oral airway should be inserted. When respiration is absent or poor, or where there is no detectable carotid pulse, it may be difficult to tell if the patient is dead or alive. If there is uncertainty about the possibility of life, always try artificial respiration and heart compression. When life-saving measures have been carried out, the patient's wet clothing should be removed and plans made for his immediate and rapid warming. If

possible, immersion in a hot bath carefully maintained at 40-42 ºC is desirable. If facilities are not available for maintaining a hot bath, hot water bottles or heating-pads with layers of blankets can be used to warm patients. Great care is needed to avoid burns, to which the cold patient is especially vulnerable. Also, an airway must be maintained if the patient is unconscious.

It is recommended that heat be applied only to the central core of the body. It is of critical importance not to attempt to warm the victim's arms or legs since heating of the limbs causes cold blood to flow from them to the body core causing further detrimental cooling of the core. Such incorrect treatment of hypothermia may induce a condition known as "after-drop".

The patient should be placed in the controlled temperature bath, or other methods of warming should be applied, until the rectal temperature is above 35 ºC and he has stopped shivering.

Where there is a large number of cases, first treat those not breathing (but alive) and those who are unconscious. The continuous pouring of water heated to 40-42 ºC over those waiting for treatment will increase the number of survivors.

The patient with hypothermia must be observed closely. Depression of breathing and cough reflexes may occur, and secretions may be retained. If a suction unit is available, catheter suction of the airway should be carried out frequently to remove secretions.

Nothing should be given by mouth because the patient may inhale liquid into the lungs, or he may vomit owing to a lack of bowel motility. Alcoholic drinks should not be given until 24 hours after recovery.

It may be necessary to administer intravenous fluids, but this should be done only after getting RADIO MEDICAL ADVICE. If breathing becomes shallow or slow, mouth-to-mouth artificial respiration should be given to support the patient's respiration.

In the unconscious patient with hypothermia, the pulse and blood pressure should be checked every 15 minutes and the rectal temperature every half hour. If the patient is comatose or appears to be in shock.

When the patient has been conscious for approximately 12-24 hours, 500 mg of tetracycline hydrochloride should be given by mouth every 6 hours for the next 5 days.

PLANS SHOULD BE MADE TO EVACUATE THE PATIENT FROM VESSELS TO THE NEAREST MEDICAL FACILITY AS SOON AS POSSIBLE.

CONTAMINATION WITH OIL

Do not clean off the skin (except round the mouth and eyes) until the person is warm and comfortable. Survivors who have recovered from hypothermia can be taken to a warm shower or bathroom and should their clothes taken off. Then their skin should be wiped with soft cloth and strong paper towels to remove as much of the oil as possible. Injured

or burned areas should be wiped with care or not at all. Next, if a strong warm shower is available, it can be used to remove oil. Hair shampoo will remove oil from the hair and can be used to help remove oil from the body. Then, with time, patience, help, and wiping, and using good toilet soap to clean the skin, the rest of the oil can be washed away. Solvents, scouring compounds, kerosene, and other cleaners not designed for skin-cleaning must not be used. It is, however, permissible to use jellied cleansing agents designed for the purpose. But the main cleaning-up is best accomplished by being patient and gentle, by mechanical removal of the oil by wiping and by a strong shower, and by using hair-shampoo and toilet soap.

DEHYDRATION AND MALNUTRITION

Survivors who have been adrift for several days may be suffering from dehydration. If they have been adrift for several weeks, malnutrition may also be a problem. Caution should be exercised in trying to reserve either dehydration or malnutrition rapidly. Give oral rehydration salt solution or sweetened fluids in quantities that will produce a urinary output of one litre per day initially. In temperate climatic conditions (or air-conditioned accommodation), this will usually mean an input of about 2 litres a day. If the weather is warm and the skin is moist or sweaty, higher intakes may be permitted. Initially, a diet of nourishing liquids (sugar and water or milk or soup) will satisfy nutritional requirements and should be given for the first 2 days. Then small amounts of normal food can be given additionally. RADIO MEDICAL ADVICE should be sought. This diet should continue until either the survivor can be transferred to care ashore or medical assistance is given on board.

10.0 RADIO MEDICAL ADVICE

Radio medical advice is available, by radio telegraphy or by direct radio-telephonic contact with the doctor, from a number of ports in all parts of the world. It may, on occasion, be obtained from another ship in the vicinity which has a doctor on board. In either instance, it is better if the exchange of information is in a language common to both parties. Coded messages are a frequent source of misunderstanding and should be avoided afar as possible.

It is very important that all the information possible should be passed on to the doctor and that all his advice and directives should be clearly understood and fully recorded. A comprehensive set of notes should be ready to be passed on the doctor, preferably based on the format, part (a) is for cases of illness, part (b) for cases of injury. Have a pencil and paper available to make notes, and remember to transcribe these notes on to the patient's and ship's records after receiving them. It is a good idea to record after receiving them. It is a good idea to record the exchange of information by means of a tape-recorded, if one is available.

This may then be played back to clarify written notes. The doctor may not be aware of the contents of your ship's medical chest, and it will save and brother if you have a list of the drugs and appliance available.

It may be necessary, under certain circumstances, to withhold the name of the patient when obtaining medical advice, in order to preserve confidentiality. In such cases the patient's name and rank may be submitted later in writing complete the doctor's records.

(a) In the case of illness

1 Routine particulars about the ship
- 1.1 Name of ship
- 1.2 Call sign
- 1.3 Date and time (GMT)
- 1.4 Course, speed, position
- 1.5.1 Port of destination is … and is … hours/days away
- 1.5.2 Nearest port is …and is …hours/days away
- 1.5.3 Other possible port is …and is … hours/days away
- 1.6 Local weather(if relevant)

2 Routine particulars about the patient
- 2.1 Surname of casualty
- 2.2 Other names of casualty
- 2.3 Rank
- 2.4 Job on board (occupation)
- 2.5 Age and sex

3 Particulars of the illness
- 3.1 When did the illness first begin?
- 3.2 How did the illness begin (suddenly, slowly, etc.)?
- 3.3What did the patient first complain of?
- 3.4 List all his complains and symptoms
- 3.5 Describe the course of his present illness from the beginning to the present time
- 3.6 Give any important past illnesses / injuries / operations.
- 3.7 Give particulars of known illnesses that run in the family (family history).
- 3.8 Describe any social pursuits or occupations that may be important (social and occupational history).
- 3.9 List all medicines / tablets / drugs that the patient was taking and indicate the dose (s)and how often taken (see 6.1)
- 3.10 Ha the patient ben taking any alcohol or do think he is taking any alcohol or do you think he is taking non-medicinal drugs.

4 Results of examination of the ill person
- 4.1 Temperature, pulse, and respiration
- 4.2 Describe the general appearance the patient.
- 4.3 Describe the general appearance of the affected part.
- 4.4 What do you done and with what result (urine, other)

5 Diagnosis
- 5.1 What do you think is the diagnosis?
- 5.2 What other illnesses have you considered (differential diagnosis)

6 Treatment

6.1 List all the medicines / tables/ drugs that the patient has taken or been given since the illness began and indicate the does (s) and the times given or how often given.
6.2 How has the patient responded to the treatment given
7 Problems
7.1 What problems are worrying you now?
7.2 What do you think you need to be advised on?
8 Other comments
9 Comments by the radio doctor

(b) In the case of injury
1 Routine particulars about the ship
1 Routine particulars about the ship
1.1 Name of ship
1.2 Call sign
1.3 Date and time (GMT)
1.4 Course, speed, position
1.5.1 Port of destination is … and is … hours/days away
1.5.2 Nearest port is …and is …hours/days away
1.5.3 Other possible port is …and is … hours/days away
1.6 Local weather(if relevant)
2 Routine particulars about the patient
2.1 Surname of casualty
2.2 Other names of casualty
2.3 Rank
2.4 Job on board (occupation)
2.5 Age and sex
3 History of the injuries
3.1 Exactly how did the injuries arise?
3.2 When did the injuries occur?
3.3 What does the patient complain of? (list the complaints in order of importance or severity)
3.4 Give important past illnesses / injuries / operations.
3.5 List all medicines / tablets/ drugs that the patient was taking before the present injury (injuries) and indicate doses and how often taken.
3.6 Has the patient been taking any alcohol or do you think he is taking non-medicinal drugs?
3.7 Does the patient remember everything that happened, or did he lose consciousness even for a very short time?
3.8 If he lost consciousness, describe when, for how long, and the degree of consciousness.
4 Results of examination
4.1 Temperature, pulse, and respiration
4.2 Describe the general condition of the patient.
4.3 List what you believe to be the patient's injuries in order of importance and severity.
4.4 Did the patient lose any blood? If so, how much?
4.5 What tests have you done and with what result (urine, other)?
5 Treatment

5.1 Describe the first aid and other treatment you have carried since the injuries occurred.

5.2 List all the medicines/tablets/drugs that the patient has taken or been given, and indicate the dose(s) and the time given or how often given. Do not use the term "standard antibiotic treatment". Name the antibiotic given.

5.3 How has the patient responded to the treatment

6 Problems

6.1 What problems are worrying you now?

6.2 What do you think you need to be advised on?

7 Other comments

8 Comment by the radio doctor

Note: pages have been renumbered for the compendium: this is page 278 of IMGS

EVALUATION BY HELICOPTER

Do not ask for a helicopter unless the patient is in serious situation and certainly never in the case of a trivial illness or far your own convenience. Remember that, apart from the expense of helicopter evacuation, the pilot and crew often risk their lives to render assistance to ships at sea and their services should be used only in an emergency.

The normal procedures is as follows. Contact the shore radio station and ask medical advice; your call will normally be transferred to a doctor. Give the doctor all the information you can so that he can assess the seriousness of the situation. He will normally give advice on the immediate care of the patient. After the link call is over, the doctor will advise the coastguard service on the best method of evaluation and, should helicopter evaluation be though desirable, the coastguard will make the necessary arrangement and will in tough with ship.

Do not except a helicopter to appear right away. There are certain operational matters to consider and, although the service is always manned, apparent delay may ensue. Remember that the range of a helicopter is limited, depending on the type in service, and you may be asked to rendezvous nearer land. In bad weather and at extreme ranges it may be necessary to arrange for another aircraft to overfly and escort the helicopter for safety reasons, and this aircraft may have to be brought from another base. Arrangement may have to be made for a refueling stop to be made at, say, an oil rig, so that the helicopter can make the pick-up and then fly back without further stops.

All this takes time and, as it is done with the utmost efficiency, please do not keep calling to ask where the helicopter is.

When helicopter evaluation is decided upon, the following measures should be taken.

1. It is essential that the ship's position should be given as accurately as possible. The bearing (magnetic or true) and distance from a fixed object, like a headland or lighthouse, should be given if possible. The type of ship and colour of hull should be included, if time allows.

2. Given details of your patient's condition, and advise immediately if there is any change in it. Details of his mobility are especially important, as he may have to be lifted by stretcher.
3. Inform the bridge and engine-room watches. A person should be nominated to communicate with the helicopter.
4. Helicopters is many countries are fitted with a VHF and/or UHF radio transmitter. They cannot normally work on the MF frequencies, although certain large helicopters can communicate on 2182 kHz MF. If direct communication between the ship and the assisting helicopter cannot be effected on either VHF or 2182 kHz, it may be possible to communicate via a lifeboat of there is one is in the vicinity. Alternatively a message may be passed via a Coast Radio Station or Coastguard Station on 2182 kHz, or on VHF.
5. The ship must be on a steady course giving minimum ship motion.
6. An indication of relative wind direction should be given. Flags and pennants are suitable for this purpose. Smoke from a galley funnel may also give an indication of the wind, but, in all cases where any funnel is producing exhaust, the wind must be at least two points off the port bow.
7. Clear as large an area of deck (or covered hatchway) as possible and mark the area with a large letter "H" in white. Whip or wire aerials in and around the area should, if at all possible, be taken down.
8. All loose articles must be securely tied down or removed from the transfer area. The downwash from the helicopter's rotor will easily lift unsecured covers, Tarpaulins, hoses, rope, rubbish, etc., thereby presenting a serious flying hazard. If ingested by the engine, even small pieces of paper can cause a helicopter to crash.
9. From the air, especially if there is a lot of shipping in the area, it is difficult for the pilot of the helicopter to pick out the particular ship he is looking for from the many sight, unless that ship uses a distinctive distress signal that can be clearly seen by him. One such signal is the orange-coloured smoke signal carried in lifeboats. This is very distinct from the air. An Aldis lamp can also be seen, except in very bright sunlight when the lifeboat heliograph could be used. The display of these signals will save the helicopter pilot valuable time in locating the casualty and may mean all the difference between success and failure.
10. Never hook the hoist cable of the helicopter to any part of the ship.
11. The winch wire should be handled only by personnel wearing rubber gloves. A helicopter can build up a charge of static electricity which, if discharged through a person handling the winch wire, can kill or cause severe injury. The helicopter crew will normally discharge the static electricity can build up during the operation to give unprotected personnel a several shock.
12. When cooperating with helicopters in rescue operations, ships should not attempt to provide a lee while helicopters are engaged in winching operations, as this tends to create turbulence.

13. The survivor is placed in the stretched, stretcher and crewman are winched up into the helicopter. If the patient is already in a Neil-Robertson type stretcher, this can either be lifted straight into the aircraft or placed in the rigid frame stretcher.
14. At all times, obey the instructions of the helicopter crew. They have the expertise to do this job quickly and efficiently.
15. If the hoist is being carried out at night, point searchlights vertically to aid in locating the ship. Light the pick-up area as well as possible. Be sure you do NOT shine any lights on the helicopter, so that the pilot is not blinded. If there any obstruction in the vicinity, put lights on them so that the pilot will be aware of them.

PREPARATION OF THE PATIENT FOR EVACUATION

Place in a plastic envelope the patient's medical records (if any), together with any necessary papers (including passport), so that they can be sent with him.

Add notes of any treatment given, and see that he has a tag attached to him if morphine has been given.

If possible, ensure that your patient is wearing a life-jacket, before he is moved to the stretcher.

SHIP-TO-SHIP TRANSFER OF DOCTOR OR PATIENT

This is seamanship problem that demands high standards of competence for its safe and efficient performance. There should be no need to advise professional seamen concerning this operations, but this guide nay occasionally be in the hands of yachtsmen or operators of small craft, to whom a few reminders may be helpful.

A very large tanker or other ship under way at sea may require 30 minutes or an hour to bring her main propulsion machinery to standby, so use your daylight signaling apparatus or VHF as soon as possible. Loaded, large tankers required several miles to lose headway and are difficult to maneuver close to small craft.

Light (unloaded) ships of any type and high-sided passenger ships will make considerable leeway when stopped and must be approached with caution. Some ships may have to turn their propellers very slowly during the operation.

Keep clear of the overhang of bows or stern, especially if there is any sea running. Also beware of any permanent fendering fitted at ships' sides. The general rule is that the ship with the higher freeboard will provide illumination and facilities for boasding and will indicate the best position.

Do not linger alongside for any reason; as soon as the operation is completed, use full power to get your craft clear. There may be a suction effect that will hold you alongside, and this may be dangerous if you do not use full power. For your own safety, make sure

you are seen and that your actions are communicated to the master of the larger ship, and act promptly on his instructions.

COMMUNICATING WITH DOCTORS

As a matter of courtesy as well as of information, a letter or form should always be sent with any patient who is going to see a doctor. The crew member will be a stranger to the doctor, and there might even be a language difficulty. A clearly written communication in a foreign language is often easier to understand than a spoken one. The letter should include routine particulars about the crew member (name, date of birth) and about the ship (name of ship, port, name of agent, owner). The medical content of the letter should be set out in a systematic way, providing the doctor with a synopsis way, providing the doctor with a synopsis of everything know about the patient that may be relevant, including copies of any information from doctors in previous ports.

11.0 PHARMACOLOGY

SHIP'S MEDICINE CHEST

In the sick-bay (ship's hospital), there should be cabinets and drawers to provide separate storage space for different groups of medicines, such as internal medicines ¡, external drug preparations, poisons, and controlled substances (requiring greater security). Also, a refrigerator should be available, not necessarily in the sick-bay, for medicines that require storage in a cool or cold place. To avoid confusion, the equipment, instruments, and surgical supplies should be stored in spaces separates from those holding pharmaceuticals.

Cabinets should be large enough to hold a "working quantity" of the recommended medicines and surgical equipment, instruments, and supplied. They should permit orderly and convenient storage. All stand-up medicine containers should preferably be arranged alphabetically, by generic name, with the labels clearly visible. Adequate lighting should be provided.

Immediately after use, medicaments and surgical supplies should be returned to their proper places. Medicines should never be put into the medicine cabinet in an open unlabelled glass, cup or other container. If the content of a container is not known for certain, it should be destroyed.

Immediately after use, medicaments and surgical supplies should be returned to their proper places. Medicines should never be put into the medicine cabinet in an open unlabelled glass, cup, or other container. If the content of a container is not known for certain, it should be destroyed.

Generally the shipping company will delegate the immediate responsibility for the ship's sickbay and the medicine chest to a deck or staff officer who is trained in fundamental medical techniques. This officer should be the only person (other than the ship's master)

to have the keys of the sick-bay and the medical supplies. A duplicate set of sick-bay keys should be in the master's safe, or some other secure place.

Narcotics, stimulants, sedatives, and other controlled substances should be kept in a locked compartment.

The shelves of the medicine cabinet should be equipped with guard-rails, dividers, or other devices; and drawers should have catches to prevent bottles and other items from falling or moving when the ship rolls and pitches.

It is important that the contents of the ship's medicine chest should be inspected annually by a pharmacist. Changes may occur in medicaments which are predictable to a pharmacist, even though not physically apparent.

Also the expiry date of medicines should be checked periodically, and expired drugs should be replaced by fresh supplies.

Procurement and storage

The followings rules should be observed to help ensure that the medicines will meet the proper standards at the time of use.

- Purchase medicines in the manufacturer's package, whenever possible.
- If the local brand or trade name of the drug does not correspond with the generic name, as given in the list of medicines in the guide, an additional label with the generic name should be put on each package. The dose in milligrams per tablet or per vial/ampoule should be clearly indicated on the package, as well as the expiry date, the lot or control number, and the name and address of the manufacturer.
- Procure medicines in the smallest practicable size, such as acetylsalicylic acid tablets, 300mg, in containers of 100s, rather than 500s. In addition, capsules, tablets, and other dosage forms should be obtained in individually package and labelled doses when available.
- Date all medicine containers upon receipt.
- Place the new stock behind the old stock on the shelf for proper rotation of supplies.
- When medicines are first received, carefully read all labels on containers to ensure that the vendor has not made an error and has supplied the kind and strength of medicament requested.
- Note the recommended storage temperature. When none is specified, the drugs should be stored at a room temperature if 15-25 ºC. Some of the drugs should be kept. Under refrigeration (2-5 ºC), but care must be taken not to freeze them, otherwise they will lose their potency, or the ampoules will be broken.
- Medicines must be protected against excessive humidity, and light. Powders, tablets, etc. should be kept in tightly closed metal boxes, or in bottles with glass stoppers.

- Controlled substances, such as narcotics, depressants, and stimulants, should have special labels reading CONTROLLED DRUG. Other warning should also be used where appropriate, POISON, or FOR EXTERNAL USE,

Medicines obtained by individuals

If a seaman goes to a doctor ashore, he should be asked to obtain from the doctor a written note indicating both the pharmaceutical name of any medicine prescribed and when and how it is to be taken. If the seaman returns with a medicine, check that the written instructions tally with the description, etc. on the bottle, ampoule, or box of medicine. It may be necessary to check the prescription with the radio medical doctor.

Controlled drugs

Controlled drugs are those preparations that, in most countries, are subject to prescription requirements limiting their distribution and use. Some of the drugs (such as morphine) are subject to very strict controls.

A ship must not carry quantities of these drugs greater than those specified in the list of medicines in this guide, unless required to do so by a doctor, for valid reasons.

Controlled drugs should be obtained only from a retail pharmacist or other person licensed to supply drugs, and he will require an order worded along the lines shown opposite. The order must be signed by either the vessel's owner or its master.

Requisition of controlled drugs
To: (Name and address of authorized supplier)
From: (Name of ship, and of master or shipowner)
Address: (Address of ship or shipowner)
Please supply (Name, strength, and quantity of drugs).
The above drugs are required for the medical stores of (Name of vessel).
Signature:
Name in capital letters:
Occupation:
Date:

Regulations in some countries require that a record of any treatment given to anybody on board, including the type and quantity of any medicines and drugs supplied, must be entered in the log book. Additionally, for controlled drugs, the master of the vessel is required to maintain, in a bound book, a "two-section" register. The two sections of the register should detail why, when, and in what quantity the master purchased, impounded, dispensed, or disposed of the drug. The register must be kept for two years after the date of the last entry in it.

Use of analgesics (pain-killing drugs)

The selection of pain-killers carried aboard will deal with every variety of pain likely to be met. Individual patients will vary in their response to treatment, so it will be necessary to exercise some judgement in deciding the dose and the preparation or combination of preparation that is necessary in each case. It is always best not to discuss the choice of medicine with the patient, or within his hearing. It is also important to prescribe with confidence and to assure the patient that the medicine will bring relief. The pain-killers carried are:

- For mild to moderate pain:
  Acetylsalicylic acid tablets, 300mg
- For severe pain:
  Morphine sulfate, 10-mg injections.

Acetylsalicylic Acid (aspirin)

The usual dose given to relieve pain is 2 tablets, repeated if necessary every 6 hours.

This drug will act rapidly to relieve most forms of mild to moderate pain, particularly those affecting muscles and joints. It will also help to reduce a high temperature, a property that makes it particularly useful in dealing with the aches and pains experienced in feverish conditions. The side-effects of treatment are usually mild and of infrequent occurrence.

Paracetamol

Usual dose: 2 tablets, repeated if necessary every 6 hours.

This drug is effective in reducing pain. It is a suitable alternative treatment for patient who do not tolerate acetylsalicylic acid.

Morphine sulfate

Usual dose: 10-15 mg (1-1 ½ ampoules).

This is a powerful pain killer, which should be used only where specifically mentioned in this guide, or when advised by a doctor.

Morphine is given either by subcutaneous injection, when it will act within 10-15 minutes, or by intramuscular injection to obtain slightly quicker pain relief.

When very severe pain is present, it may be necessary to repeat doses. In all cases, after three injections have been given, RADIO MEDICAL ADVICE should be sought on the advisability and frequency of further morphine injections.

Dispensing medicines

When a diagnosis has been made, note from the relevant section of the guide the name and strength of the medicine prescribe and the method of giving it. Medicines prescribed

in the guide should be taken by mouth unless the guide states that they should be given some other way. Note to the amount to be given at any one time, the interval between doses, and the number of days during which the medical should be given. Then obtained from the medical cabinet the medicine with the same name and strength.

Take great care to give the does the guide advises, as expressed in grams (g) or milligrams (mg). For some drugs (as for instance chloroquine), the recommended dosage may be specified in relation to the patient's weight, for instance, 5 milligrams if chloroquine base per kg of body weight. For a patient who weighs 60 kg, for example, the following simple calculation gives the dose:

60 kg x 5 mg = 30 mg of base

Since one 250-mg chloroquine phosphate tablet contains only 150 mg of base, 2 tablets of this drug will be needed.

With many drugs, particularly antibiotics such as penicillin or erythromycin, it is necessary to maintain a constant concentration of the drug in the bloodstream. This is best achieved by ministering it at uniform intervals, such as every 6 hours around the clock.

It is advisable to avoid taking certain drugs at mealtimes. Others should be taken along with a lot of fluid (for example, sulfamethoxazole + trimethoprim). Such recommendations should be followed as closely as possible to obtain the basic results.

When administering the standard antibiotic treatment, ensure that all the medicine is taken, even if the patient seems cured by the third day. To terminate the course prematurely, because the patient feels better, may lead to a resurgence of infection.

One person, other that the patient, should be made responsible for giving him his medicine and recording the amount and time of each dose. The patient should not normally be told to treat himself, nor should medicines be left at the bedside. In malarial areas one officer should be responsible for giving each crew-member the preventive drug; the drug should not be left on the mess table for crew-members to take if they remember to do so.

If the treatment prescribed is completed, and the patient is not fully recovered, do not simply give more of the same treatment but get RADIO MEDICAL ADVICE.

Used with knowledge and care, medicaments can be lifesaving, but, used irrationally, they may do much harm. NO medicaments should be taken indiscriminately.

Side-effects and interactions of drugs

Many drugs produce side-effects, hypersensitivity, or allergy. Before giving a medicine, first read the caution note relating to each of the drugs contained in the ship's medicine chest.

Another possible problem may be the interaction of medicaments. An example of a particularly serious interaction between drugs is dangerous (and even occasionally fatal) combination of two or more central nervous system (CNS) depressants. A tranquillizer such as chlorpromazine in combination with a sedative such as phenobarbital may produce coma and cardiac and/or respiratory arrest, and cause death.

It is important to remember that ethyl alcohol is a central nervous system depressant and that, if it is taken in conjunction with other CNS depressants, even a moderate amount of alcohol can be fatal. It is best to advise any patient taking drugs to exercise moderation in the consumption of alcoholic beverages or, ideally, to abstain from them.

With most of the drugs listed, a patient will not notice any side-effects. Even when he does, it will often be of little importance for instance slight nausea or diarrhea, or a slight rash. This should not be a deterrent to use of the prescribed medicines, strictly in accordance with the instructions given by the guide, or by a doctor.

Occasionally the side-effects will be pronounced, and in this case they should not be ignored. A decision on continuation or change of treatment will then be needed. The guide offers some advice in alternative treatment.

If a side-effect is pronounced, it will usually be necessary to seek RADIO MEDICAL ADVICE.

Dispensing for children

If at all possible, get RADIO MEDICAL ADVICE before giving medicines to children under

16 years. If you cannot get that advice given below. In either event, during the hour following any medication, note the child's general condition and taken the pulse and respiration rates from time to time. If the child seems faint, or the pulse or respiration rate becomes either rapid or slow, get RADIO MEDICAL ADVICE before giving another does.

Tablets and capsule

In giving tablets and capsule to small children, it will probably be easier if the tablet for adults is crushed and the required amount abstracted and given mixed with honey, jam, a little orange juice, or milk.

Morphine

Do not give morphine to children under 10 years of age.

For children aged 10-15 years, do not give more than 10mg (in exceptional cases more than that may be given, on the advice of the radio medical doctor).

Erythromycin tablets, 250 mg

- Under 2 years: ½ tablet every 6 hours
- 2-8 years: 1 tablet every 6 hours
- 8 years and over: adult dose

Tetracycline hydrochloride capsule, 250 mg

Do not give tetracycline to children under 12 years. For children 12 year and over, the adult dose may be prescribed.

Phenoxymethyl penicillin potassium tablets, 250 mg

- Under 2 years:

¼ tablet every 6 hours, when the adult dosage is 1 tablet every 6 hours

½ tablets every 6 hours when the adult dosage is 2 tablets every 6 hours

- 2-13 years

½ tablet every 6 hours, when the adult dosage is 1 tablet every 6 hours

1 tablet every 6 hours, when the adult dosage is 2 tablets every 6 hours

- 13 years and over: adult dosage

Procaine benzylpenicillin injection, 600 000 units/ml

- Under 2 years: 150 000 units (¼ ml) every 12 hours
- 2-8 years: 300 000 units (½ ml) every 12 hours
- 8 years and over: adult dose

Cyclizine hydrochloride tablets, 50 mg

- Under 6 year: ¼ tablet
- 6-13 years: ½ tablet
- 13-16 years: ¾ tablet

Sulfamethoxazole + trimethoprim tablets, 480 mg

Do not give these tablets to infants aged less than 6 months.

- 6 months to under 6 years: 240 mg (½ tablet) every 12 hours
- 6-13 years: 1 tablets every 12 hours

- 13 years and over: adult dose

Lotions, creams, ointments and drops

Follow any instructions on the container, other-wise treat the child as an adult; do not be lavish with any application, especially to children under 4 years.

Other medicines

Give the dose, if any, recommended on the container, or:

- Up to and including 1 year: 1/10 of the adult dose
- 1-4 years: 1/3 of the adult dose
- 4-10 years: ½ of the adult dose
- 10-15 years: ¾ of the adult dose

Standard antibiotic treatment

Reference has been made to the following treatment for a number of complaints, using the words "give the standard antibiotic treatment" for the sake of brevity.

For patients not allergic to penicillin

If able to take tablets by mouth:

Phenoxymethyl penicillin potassium (250-mg tablets) 2 tablets, followed by 1 tablet every 6 hours for 5 days.

If unable to take tablets by mouth:

Procaine bensylpenicillin, 600 000 units intramuscular once a day for 5 days

For patients allergic to penicillin

If able to take tablets by mouth:

- Erythromycin, 500 mg, followed by erythromycin, 250 mg, every 6 hours for 5 days

If vomiting:

- 30 minutes before a dose of erythromycin is taken, given one 50-mg cyclizine hydrochloride tablets (to a child aged 1-10 years, give half a tablet; those over 10 years can be given one tablet)

Note the use of penicillin

Penicillin is a powerful drug, capable of destroying the germs causing many diseases, but it should not be used lightly since people may become sensitive to it. Mild sensitivity may cause a general disturbance, with transient; severe sensitivity may cause fainting collapse, and even death. Severe cases are rare, but if collapse occurs after the administration of penicillin, given a subcutaneous injection of epinephrine, 1 ml ampoule, immediately. Whenever a penicillin injection is given, a sterile syringe and an ampoule of epinephrine should be kept within reach.

In view of the danger of sensitivity, it is important always to question a patient about to receive penicillin on whether he has ever had any reactions to penicillin. If he has such reactions, or many possible have had them, do not give penicillin, either by mouth or by injection, but give erythromycin instead.

Provide any patient who has been given penicillin and is going to a hospital ashore with a note stating how much penicillin he has had and how and when it has been given.

Penicillin is usually most effective in acute inflammation. Some of the more common causes of acute inflammation at sea are: boils, abscesses, carbuncles, cellulitis, erysipelas, infected wounds and burns; infected ears; tonsillitis and quinsy (peritonsillar abscess); and pneumonia.

12.0 STERILIZATION

CLEANLINESS ANS STERILIZATION

To prevent infection in wound, burns, and other injuries, all dressings and instruments should be sterile.

Dressings should be supplied pre-packed and sterilized.

There are two ways of obtaining sterile instruments:

- The instrument or equipment can be obtained in pre-packed sterilized containers. Such instruments are for once-only use and are disposable. Disposable equipment is very convenient to use.
- Instruments that are not disposable should be sterilized prior to use by placing in boiling water for not less than 20 minutes. The “patient end” of an instrument must not touch anything before use, and the operator should touch only those parts of the instruments he has to handle in using it.

The attendant should similarly guard against infecting the wound by:

- Rolling up sleeves;
- Throroughly washing hands, wrists, and forearms, first with soap and running water and then with 1% cetrimide solution.

13.0 CARDIAC ARREST, DROWING AND ASPHYXIA

First aid is treatment aimed at preventing the death or further damage to health of an ill or injured person perceived to be in a life-threatening condition. All crew members should receive training in first aid.

Step 1: Assess the situation: What do think happened and is there still danger?

a. If giving first aid will expose you to danger, do not do it: call or go for help.
b. If a person is still in danger, remove the danger or the person before giving first aid.
c. If bystanders are in danger, warn them.

Step 2: If you are alone, shout for help.

Step 3: Choose the best place for first aid.

a. On the spot?

- Not if fire is present.
- Not if there are potentially dangerous gases in the atmosphere.
- Not if there are other risks at the site of the accident.

b. In the ship's infirmary (sick-bay) or in a cabin?

- Not if the delay in moving the person is dangerous.

Step 4: If there are several injured people, prioritize.

a. Attend first to any unconscious person.
b. If there is more than one unconscious person:

- check each for pulse and breathing;
- begin resuscitation of a person who is not breathing or has no detectable heart beat

c. Attend to conscious patients:

- treat bleeding by applying pressure to the wound;
- wait until the patient has been moved to the sick bay before dealing with other injuries, UNLESS you suspect spinal injury.

What not to do when giving first aid

- DO NOT GIVE FIRST AID if you have doubts about your ability to do so correctly.
- DO NOT ENTER AN ENCLOSED SPACE unless you are sure it is safe.
- DO NOT MOVE THE PERSON without checking for:
  - ✓ spinal injuries
  - ✓ fractured long bones.
- DO NOT GIVE THE PATIENT ANYTHING TO EAT OR DRINK (especially alcohol).

THE ABC SEQUENCE OF BASIC LIFE SUPPORT

Note

- Basic life support is a sequence of actions aimed at resuscitating a person whose life is in danger.
- A person's life is in danger when one or more of the two vital functions - breathing (respiratory function) and blood circulation (cardiac function) - have ceased or are about to cease and death is likely if proper action is not taken immediately.
- Basic life support restores the two vital functions: breathing and blood circulation. It uses an "ABC" sequence of actions to ensure an open Airway aimed at restoring Breathing and blood Circulation.
- Cardio-pulmonary resuscitation (CPR) is the main component of basic life support: consists of artificial respiration and external cardiac compression.

SHAKE AND SHOUT

- Before starting basic life support, shake the patient vigorously by the shoulder or leg and at the same time shout or call the patient's name if you know it.

AIRWAY – IF BLOCKED, OPEN IT

- Remove any loose-fitting dentures.
- Check for obvious spinal injury.
- Tilt the patient's head back by exerting pressure on the upper forehead with one hand.
- Use two fingers of the other hand to raise the chin.
- If spinal injury is suspected, tilt the head back, but only enough to keep the airway open, and pull the lower jaw forward rather than raising the chin.
- Prepare for the possibility of mouth-to-mouth rescue breathing by making sure the thumb and index finger of your hand that is on the patient's forehead are free to pinch the patient's nose.
- Use your fingers to remove any visible obstructions from the patient's mouth and throat.

BREATHING – IF STOPPED, RESTART IT

- Nook, listen, and feel for signs of regular breathing:
  - ✓ nook for chest movements;
  - ✓ listen for sounds of breathing at the patient's mouth
  - ✓ feel for exhaled air on your cheek.
- If there are no signs of regular breathing:
  - ✓ send or shout for help;
  - ✓ give two rescue breaths
- If normal breathing resumes:
  - ✓ place the patient in the recovery position.

- If normal breathing does not resume:
  - ✓ check again for obstruction to the airway;
  - ✓ check that the head is tilted enough and the chin raised enough;
  - ✓ try again to restore breathing with two strong rescue breaths
- If normal breathing still does not resume, check the blood circulation.

CIRCULATION – IF STOPPED, RESTART IT

- Check the patient's pulse
- If there is no detectable pulse, give chest compressions and rescue breaths
- When giving chest compression, do rescue breathing at the same time, since breathing stops when the heart stops.

Note: Once breathing and circulation have been restored, place the patient in the recovery position.

A BASIC LIFE SUPPORT SEQUENCE

- RESPONDS TO SHAKE AND SHOUT – NO.
- BREATHES – YES.
- HEART BEATS – YES:
  - ✓ put patient in recovery position
  - ✓ check for other life-threatening conditions.
- RESPONDS TO SHAKE AND SHOUT – NO.
- BREATHES – NO.
- HEART BEATS – YES:
  - ✓ clear airway
  - ✓ apply rescue breathing.
- RESPONDS TO SHAKE AND SHOUT – NO.
- BREATHES – NO.
- HEART BEATS – NO:
  - ✓ apply cardio-pulmonary resuscitation (CPR).

MOUTH-TO-MOUTH RESCUE BREATHING

- With one hand under the patient's neck, keep the patient's head tilted as far back as it will go – unless you suspect spinal injury, in which case use minimal tilt.
- Place the heel of your other hand on the patient's forehead with the thumb and index finger facing towards the nose.
- Pinch the patient's nostrils with your thumb and index finger to prevent air from escaping.
- Open the patient's mouth, take a deep breath, then form a tight seal with your lips over and around the patient's mouth.
- Use a Guedel airway if available.
- Insert the Guedel airway between the patient's jaws with the concave curve facing upwards (towards the patient's head).

- Push the airway gently into the mouth while rotating it 180° so that the concave curve faces downwards and the airway points towards the patient's lungs. Leave the airway flange outside the teeth.

- If it is not possible to open the patient's mouth or to form a seal around it with your mouth, apply mouth-to-nose rescue breathing.
- Breathe into the patient's mouth at a rate of one breath every five seconds or 12 breaths a minute, completely refilling your lungs after each breath.
- Continue until the patient's chest rises and falls with each rescue breath and you feel the patient's exhaled breath on your cheek.
- If you feel no air on your cheek, check if there is a foreign body in the patient's throat and, if so, remove it with your fingers before resuming rescue breathing.

MOUTH-TO-NOSE RESCUE BREATHING

- Use mouth-to-nose rescue breathing if any one of the following conditions applies:
  - ✓ the patient's mouth cannot be opened;
  - ✓ a tight seal cannot be obtained around the patient's lips;
  - ✓ an obstruction cannot be removed from the patient's mouth;
  - ✓ the patient has been rescued from water and the rescuer needs to use one hand to support the body and is therefore unable to use that hand to close the nose for mouth-to-mouth rescue breathing.
- Keep the patient's head tilted back with one hand: use the other hand to lift the patient's lower jaw to seal the lips.
- Take a deep breath, seal your lips around the patient's nose and breathe into it forcefully and steadily until the patient's chest rises.
- Remove your mouth and allow the patient to exhale passively.
- Repeat the cycle 10–12 times per minute.

USING A BAG AND MASK RESUSCITATOR

- A bag and mask resuscitator can be used for rescue breathing to replace mouth to-mouth or mouth-to-nose breathing.
- The advantages of a bag and mask resuscitator are that a rescuer can use it for longer before becoming exhausted, and oxygen tubing can be attached to the bag.
- To use a bag and mask resuscitator:
  - ✓ lay the patient on his back;
  - ✓ check that the mask is approximately the right size for the patient;
  - ✓ insert a Guedel airway (see above);
  - ✓ send someone to bring an oxygen cylinder and attach oxygen tubing to the resuscitator: do not spend time doing this yourself, and do not wait until it has been done;
  - ✓ with one hand under the patient's neck, keep the patient's head tilted as far back as it will go – unless you suspect spinal injury, in which case use minimal tilt;
  - ✓ place the mask over the patient's nose and mouth;

- ✓ hold the mask in place with your right hand, by clamping your thumb over the mask and using your fingers to hook under the patient's jaw and pull it up towards the mask;
- ✓ use your left hand to compress the bag, forcing air into the patient's lungs;
- ✓ there is a valve which allows air to escape from the lungs when you release the bag: DO NOT take the mask off the patient's face between breaths;
- ✓ inflate the patient's lungs at a rate of about 12 per minute;
- ✓ check with each breath that there is little or no leak of air around the mask: common causes of a leak are the patient's head being turned to one side, and the jaw not being pulled upward firmly enough.

How to administer oxygen

- Note that:
  - ✓ oxygen is given to a patient who is breathing spontaneously but has difficulty breathing or has a disorder that impairs the uptake of oxygen into the lungs or the delivery of oxygen to the tissues;
  - ✓ spontaneous combustion can occur in the presence of oxygen: smoking, naked lights or fires must not be allowed where oxygen is being administered;
  - ✓ if an illness is serious enough to warrant the use of oxygen it is serious enough to seek medical advice;
  - ✓ oxygen delivered through valve and bag resuscitation kits – used primarily for victims who are not breathing – should be given only by trained personnel.
- Ensure that the airway is open.
- If the patient is unconscious, insert a Guedel airway
- Check that the oxygen cylinder is not empty and that the regulator and flow meter are properly attached to the cylinder and turned off.
- Turn the main oxygen cylinder valve fully on.
- Fit the mask snugly over the patient's nose and mouth.
- Set the flow meter to the chosen rate.

How to perform chest compression

- Note that chest compression should always be performed in conjunction with rescue breathing: ideally, one rescuer gives chest compression and a second rescuer gives rescue breathing.
- Place the patient on a solid surface, if it is possible to do this without delay.
- Kneel at the patient's side and place your hand (hand A) that is closest to the patient's feet on the on lower half of the patient's sternum (Figure 1.8).
- Keep the index and middle fingers of hand a together and with the middle finger locate the bottom edge of the lowest rib nearest to you.
- Slide both fingers medially (inwards) along this rib to the point where the rib joins the sternum.
- Place your middle finger on this point and your index finger on the sternum.

- Slide the heel of your other hand (hand B) down the sternum until it reaches the index finger of hand A: this should bring hand B to the middle of the lower half of the sternum or about 4 cm above the lower tip of the sternum (xiphoid process).
- Place the heel of hand A on top of hand B.
- Extend or lock together the fingers of both hands and lift them to check that you are not going to press on the patient's ribs.
- Rock forwards so that your shoulders are almost directly above the patient's chest.
- Keep your arms straight and push down on the sternum so as to depress it by 4–5 cm.
- Release the pressure but keep your hand in contact with the patient's chest.
- If you are the only rescuer, you should give 100 chest compressions per minute (one to two compressions a second) with two very quick rescue breaths after every 15 chest compressions.
- Count compressions aloud.
- Do not wait for the patient to exhale before resuming chest compressions.
- If there are two rescuers one should be at the patient's head giving one rescue breath after every five compressions, in which case chest compressions should be given at a rate of 60 per minute (if the victim is an adult): chest compressions should be continuous, with no pause for rescue breaths.
- Check the reaction of the patient's pupils:
  - ✓ if the pupils narrow (contract) when exposed to light (the light of a pocket lamp, for example), the brain is receiving adequate blood and oxygen;
  - ✓ if the pupils remain widely dilated and do not react to light, serious brain damage is imminent or has occurred.
- Check the carotid (neck) pulse after the first minute of heart compression/rescue breathing and every five minutes thereafter to see if the heart is beating spontaneously.
- If there are two rescuers they should change roles every few minutes.
- Look for other positive signs, such as:
  - ✓ expansion of the chest each time air is forced into the patient's lungs;
  - ✓ a detectable pulse each time the chest is compressed;
  - ✓ return of colour to the skin;
  - ✓ a spontaneous gasp for breath.

What not to do when giving chest compression

DO NOT START CHEST COMPRESSIONS if the patient shows any evidence of a heart beat or pulse, even if the heart beat is very slow or very weak: in such cases, chest compression could cause dangerous abnormal heart rhythms and further complications. DO NOT EXERT PRESSURE on the lower tip of the sternum (xiphoid process) in case you tear the liver and cause severe internal bleeding.

DO NOT PRESS on the patient's ribs: you risk causing rib fractures.

DO NOT STOP GIVING CHEST COMPRESSIONS UNTIL:

- ✓ a physician tells you to; OR
- ✓ the patient's heart beat and breathing have returned; OR
- ✓ you are too exhausted to continue.

USE OF AUTOMATIC EXTERNAL DEFIBRILLATORS

Defibrillation is the use of a direct-current electrical shock to restore normal heart rhythm to a person whose heart has stopped pumping because it is in the abnormal rhythm ventricular fibrillation (cardiac arrest or sudden cardiac death).

The Automatic External Defibrillator (AED) is a battery-powered device that detects the electrocardiogram of a person, uses a computer program to determine whether the person's heart rhythm is ventricular fibrillation, then prompts the operator to trigger an electrical shock whose intensity is automatically adjusted by the AED.

AEDs can be used safely by people without medical training, and if used within 2 or 3 minutes of a cardiac arrest and followed up by hospital care, can improve short-term outcomes.

AEDs are not appropriate equipment for the majority of vessels. Vessels which often carry elderly passengers (who are much more likely to suffer cardiac arrest than younger people) and vessels whose operations expose crew to a risk of electrocution should consider carrying one or more AEDs. If AEDs are carried crew should be trained in their use, and in the care of patients surviving cardiac arrest.

14.0 PSYCHOLOGICAL / PSYCHIATRIC PROBLEMS

Studies reveals that the long working days, heat in work places, separation from their family, time pressure/ hectic activities, and insufficient qualifications of subordinate crew members are the most important stressors on board.

The seafarers with higher stress due to heat in shipboard operations had shorter job duration at sea. The stressors of heat and noise show that physical stressors on ships currently are still very important in spite of the increasing mechanization in seafaring.

The separation from the family is regarded as a further important stressor on ships. The associations between professional group and shipboard stressors were not significant except for heat in workplaces.

Especially the engine room personnel, permanently being close to the heat-producing engines, stated a higher stress level due to heat in their workplaces.

Additionally, the time pressure aboard was regarded as more stressful by less-than one third of the engine personnel, but by half of the deck-side seafarers. A higher stress level due to insufficient qualification of subordinate crew members was slightly more frequently complained about by deck than by engine room seafarers.

The stressor separation from their family also depended on the age of the seafarer and was more predominant in younger seafarers, particularly when having children.

The deck-side officers stated a higher stress level due to time pressure and hectic activities on board. This can be attributed to their frequently extremely long working days due to unexpected situations and to the increasing amount of administrative duties.

Extremely high number of working hours over a lengthier period of time combined with a lack of sleep can elicit chronic fatigue, health problems and safety risks on the vessels.

The study showed that engine room seafarers had a lower stress level than deck side seafarers due to long working days and time pressure or hectic activities. This indicates regular working hours and routine procedures in the engine room, whereas especially the deck personnel has to react to permanently changing job demands such as port clearance, district routes and watch-keeping at sea.