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S E A R C H & R E S C U E M A G A Z I N E

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EMERGENCY 84 by International Civil Defence

The Second International Congress on Disaster Preparedness and Relief, organized jointly by the Office of the United Nations Disaster Relief Coordinator - UNDRO, the International Civil Defence Organization and the League of Red Cross Crescent Societies will be held from 2nd to 5th October 1984 at the Palais des Expositions et des Congres of Geneva.

General theme of the Congress: BUILDINGS AND EMERGENCIES.
Futhermore, discussions will cover the following sub-topics:

1. Fire precautions and rescue operations in high-rise buildings and places of public assembly (e.g. hospitals, theatres, sports stadia, schools, department stores, government buildings, offices, shopping centers, etc.);
2. Rescuing people trapped under collapsed buildings and debris;
3. Casualties: evacuation and treatment of people injured by fire, bombing, collapse of buildings, debris, etc.;
4. Planning and preparing for relief and rescue operations in major urban disasters, i.e., in areas of high building and population densities, following severe natural disasters;
5. Emergency shelter provision following natural disasters;
6. Protection, maintenance and repair of life-line system (roads, rail, bridges, water, sewers, power, telecommunications, etc.) in areas exposed to severe natural hazards.

The Congress will feature first of all plenary opening and closure sessions. Futhermore, workshop meetings will run concurrently in two conference halls to cover various topics mentioned above. Participants will thus have the opportunity to discuss the proposed items thoroughly and prepare the conclusions to be presented at the plenary closure session.

The working languages of the Congress will be Arabic, English, French and Spanish, with a simultanneous interpretation system operating for all the meetings.

The International Exhibition of Equipment, Supplies and Services

EMERGENCY 84 - related to disaster preparedness and relief will be co-organized, also from 2nd to 5th October 1984, in the halls of the Palais des Expositions et des Congres of Geneva. Exhibits will include special vehicles,

communications systems, shelters and temporary dwellings, field hospitals, medical equipment and supplies, fire-fighting vehicles and material, water supply and treatment devices, rescue equipment, flame cutting, debris clearance, lifting and handling equipment, oil spill fighting aids, sirens, etc.

Parallel to the two events, from 2nd to 5th October 1984, the Palais des Expositions et des Congres will also shelter the International Medical Aviation Exhibition Medic-Air 84.

Participants to EMERGENCY 84 Congress will have free entrance to both exhibitions.

Addresses of the organizers:

EMERGENCY 84 Congress: Congres Secretariat, ICDO, 10-12 chemin de Surville, 1213 Petit-Lancey/Geneva, Switzerland.

EMERGENCY 84 Exhibition: Mack-Brooks Exhibitions Ltd., 62 Victoria Street, St. Albans, Herts. AL1 3CT, Great Britain.

MEDIC-AIR 84 Exhibition: ORGEXPO, P.O. Box 112, 1218 Grand-Saconnex/Geneva, Switzerland.

DROWNING

(International Civil Defence: no. 337, page 3-7)

Each year the arrival of the summer is marked by the appearance in the daily press of accounts of drownings. It is true that the mass exodus of town-dwellers towards the sea or the countryside does increase the risk of drowning accidents, but it should not be forgotten that drowning can be a tragedy in the home (indisposition when taking a bath, for example). The number of people who die from drowning is sufficient in itself to warrant a study of these accidents, but there is also the fact that this is the very type of accident which can profit most from the progress of primary resusciation:

- Progress in resuscitation by using the insufflation methods of artificial respiration and external cardiac massage.
- Progress also in the means now available and which raise the various problems involved in teaching first aid, in organizing rescue work and in information and prevention.

Finally, and the most important of all for the victims, there is the question of the count down where speed is essential for success:

- The race against time.
- Being able to take on the spot actions which should have been mastered and understood if they are to be effective in saving lives.

1. CAUSES AND CIRCUMSTANCES OF DROWNING

Drowning is immersion with the introduction of water into the respiratory tract which entails acute asphyxia with the usual consequences: loss of consciousness, cessation of breathing cardiac arrest. If these are the consequences of accidential drowning its causes are varied but come under two broad headings.

1.1 PRIMARY IMMERSION

This is drowning in the strict sense of the word, the drowning of the experienced swimmer who, deceived by the circumstances is a prey to fatigue and is overcome by the elements. This is drowning because of exhaustion. At the opposite extreme is the person who cannot swim and who falls accidentally into the water. This is drowning because of technical incapacity. Between the two there are many situations in which the cause of drowning is a combination of both factors.
These primary immersions result in what used to be called blue drowning. It was called blue because it is a case of acute asphyxia where the lack of oxygen due to the flooding of the lungs produces cyanosis. It has been demonstrated that this type of drowning passes through four successive stages:
- The first stage is marked by apnoea due to the closing of the glottis which obstructs the upper opening of the trachea and prevents the air from passing. This is a reflex closing which occurs when the water makes contact with the glottis.
- In the second stage breathing restarts, deep breathing which helps the water to penetrate into the lungs: this is when a person can be correctly said to be drowning and usually coincides with a loss of consciousness.
- During the third stage breathing ceases, there is complete paralysis, the sphincters are loose, this is the anoxemia (deprivation of oxygen) stage which is soon followed by
- The fourth stage when the heart stops beating.

1.2 PRIMARY SYNCOPE

This is hydrocution or secondary drowning. This is the case of the swimmer who sinks like a stone without warning or after only a very few, short warning signs which should be borne in mind (headaches, cramps, feelings of distress). But the same accident can take place anywhere, in the bath or even under the shower for example. The causes of hydrocution are varied:
- The most common is hydrocution through thermic shock due to the difference between the temperature of the skin and that of the water. This type of hydrocution is frequent in hot weather since long exposure to the sun is a contributory factor as are sharp changes in temperature (diving into the water to cool-off), physical effort, digestion (in particular after a high fat content meal and alcohol). This is a reflex syncope triggered-off by the skin.
- There asre also reflex syncopes of mucous origin produced, in particular when the nasal mucosa are brought into contact with the water.
- The last of the frequent causes of syncope is trauma. This is the sharp shock of water against the abdomen, the eyes, the genital organs, it is the flexion or sharp extension of the cervical colulmn, all of these shocks may occur, for example, when diving into the water.
- The traumatic and the thermic origins may associate to produce a reflex syncope which has the appearance of a white drowning where the plenetration of water only takes place after the original cardio-respiratory arrest.

2. DIFFERENT FORMS OF DROWNING

2.1 DROWNING IN FRESH WATER

Fresh water, because of the absence of salinity (in point of fact it is saline but only very slightly so) passes very rapidly through the pulmonary alveoli towards the blood which increases in volumes and dilution. This, secondarily, results in:
- a more or less-wide scale destruction of the red globules which carry the oxygen, and
- acute pulmonary oedema.

2.2 DROWNING IN SEA WATER

The high degree of salinity of the sea, much higher than that of blood, produces a reverse movement of the blood toward the lungs. This leads to a much earlier acute pulmonary oedema which can considerably aggravate the process of drowning. In any case, a knowledge of these mechanisms which will depend solely on the state of the heart and the breathing.

3. ACTION TO BE TAKEN

Before dealing with the emergency treatment to be given to a drowning person there are four important points which should be stressed:

3.1 Whether the drowning person is blue or white has no practical importance. The only things to be taken into consideration are the degree of consciousness, the way the victim is breathing and the state of his heart and they will dictate the actions of first-aid workers.

3.2 For a long time the draining posture to evacuate water from the lungs was advocated as an essential measure before commencing resuscitation (subject flat on his stomach head turned to one side is suspended by the hips). In fact this practice should be virtually abandonded for its only use is to partically drain the upper airways. Futhermore it may cause vomiting which is a source of aggravation and wastes valuable time.

3.3 The above is also true about warming victims with hot-water bottles and frictions. These are only of limited use in the case of the conscious victim and in all other cases they are ineffective, useless and dangerous.

3.4 Emergency treatment should be given on the spot immediately the victim has been taken out of the water even if the surrounding material conditions appear to be unfavorable. Transporting victims over even a very short distance implies losing very precious seconds and reducing the chances of saving them.

4. THREE STAGES OF TREATMENT IN A DROWNING ACCIDENT

4.1 TREATMENT TO BE GIVEN BY THE RESCUERS

This differs according to the seriousness of the victims condition:
a) The victim is conscious.- There has been no lack of oxygen has been of short duration. Complete rest in a prone position is essential as is the attentive supervision of the pulse and breathing in case of an aggravation in the victim's condition. Any brusque handling of the victim is to be avoided in particular if he has to be undressed. A simple blanket will be used to keep him warm. He must, of course, be given nothing to drink, and above all no alcohol. In spite of the fact that the victim may not appear to be seriously affected he should be taken to hospital, perferably in an ambulance and under supervision.
b) The victim is unconscious but still breathing.-
- The careful clearing of the mouth will be preferred to the draining posture whose disadvantages have just been explained.
- Protection against vomiting will be ensured by placing the victim in the side safety position and by careful handling and by not using frictions and warming actions.
- At this stage two measures are absolutely essential: strict supervision of breathing to counter any ineffectiveness of artificial respiration and the

continuation of supervision during the transport of the victim to the hospital and where necessary the continuation of resuscitation.
c) The victim is lifeless, there is no sign of breathing.- This situation calls urgently for artificial respiration by insufflation which should be undertaken as soon as materially possible, in the water itself if the rescuer is competent to do so.
If the mouth to mouth technique is sometimes imapplicable because of trismus (contraction of the jaw muscles) or because of repulsion (vomiting) the mouth to nose technique can be used. In both cases, mouth to mouth or mouth to nose, the only criterion is its effectiveness as seen in the expansion of the thorax at each insufflation. Both of these methods are clearly superior to the traditional manual methods (Among these it would appear that the Sylvester-Broch method is the most effective).
Breathing into the victim should be continued without interruption so long as his own breathing is not spontaneous or is insufficient.
Closed chest cardiac massage is necessary when the pulse is imperceptible at the major blood vessels (carotids at each side of the neck, femoral arteries in the folds of the groin). The presence of bilateral dilation of the pupils which do not react to light is a sure indication that the heart has stopped breathing.
Closed chest cardiac massage should be effective but not traumatizing. Its effectiveness is marked by the presence of a pulse beat in the blood vessels and the regression of dilation of the pupils. It will not be traumatizing if it is carried out according to a very precise technique.

4.2 TREATMENT TO BE GIVEN BY ORGANIZED RESCUE WORKERS

If the treatment given by the original rescuers who are often witness of the accident is of primary importance, it is nevertheless true that it should be rapidly followed by treatment from the rescue organizations which have the material required and specially trained staff and which can also accept the responsibility for the transport of the serious cases. In some circumstances the two stages are combined and it is the specialist rescue worker who takes the victim out of the water and ensures his immediate resuscitation.
a) Conscious victim.- As well as the above measures, the victim will be given oxygen inhalations as deep as possible (outflow rate 12 to 15 litres) and these will continue throughout his transport to the hospital during which he will be under continuous supervision.
b) Victim unconscious but still breathing.- Mouth to be cleared, mucosities pumped, upper respiratory tract to be kept free (hyperextension of the head, partial dislocation of the jaw, installation of a Guedel's cannula) will be the essential measures to be taken prior to giving oxygen. The inhalations will be replaced by insufflations of pure oxygen through a mask (with a rate of 0-10 litres) using an insufflator if breathing seems to be insufficient (too slow or, on the contrary, too rapid, only slight movement of the rib cage).
c) Lifeless victim.- No sign of pulse or breathing. Simultaneous application of artificial respiration using an insufflator to administer pure oxygen: closed chest cardiac massage if bilateral dilation of the pupils and the absence of pulse beat at the main blood vessels confirm that the heart has stopped.
When it is necessary to apply artificial respiration by insufflation or closed chest cardiac massage in the resuscitation of a victim of drowning the following should be borne in mind:
a) Insufflation will only be effective if the upper respiratory tract is free and kept free permanently.
b) Excessively vigorous insufflation which fills the stomach with air will encourage vomiting. The amount of air forced into the victim will depend on his build.
c) It is often necessary to increase the pressure of the insufflations. Certain types of apparatus incorporate a device to increase the pressure.

d) Here again, whatever the temperature of the water or the atmosphere, warming or friction action should be virtually proscribed: after wiping down the victim's body it is enough to cover him with a blanket.
All of the above resuscitation measures should be carried on uninterruptedly and will be continued up to the third stage, the medical stage.

4.3 Medical stage

At one time only administered in a hospital, medical care can now be given almost at the site of the accident. This is one of the most striking conceptions of resuscitation today and the reason for the spectacular saving of lives recorded. Begun on the spot, this treatment will be continued during transport in the specially adapted ambulance.

5. CONCLUSION

Consideration of the mechanisms of drowning and its consequences leads us very logically to the problem of prevention. This has two aspects:

5.1 Prevention on a public scale

a) Assuring the safety of bathing areas by the provision of supervision and safety measures with staff and equipment (rescue equipment, communications equipment, evacuation equipment).
Whether it be rivers, seas, lakes or swimming pools which are involved, the organization should be very similar and based on the availability of the staff, their competence and the perfect quality of the first-aid material.
It should be noted that it is laid down by law and that first-aid for the victims of drowning is satisfactory in most of the major bathing areas.
b) Informing the public of the dangers when bathing and of the precautions to be taken.

5.2 Prevention on an individual scale

Public prevention is only fully effective when is is allied to prevention on an individual level:
a) By observing the safety measures dictated by the authorities responsible for bathing, for pleasure boating, for using the open water.
b) By observing certain physiological norms. We have seen that the non-observance of certain norms can be capital in causing hydrocution.
c) By bearing in mind the real dangers of the water for swimmers who are often inexperienced town-dwellers, dangers which closely depend on local conditions: currents, winds, water-holes, presence of submerged rocks near diving areas. By knowing how to recognize the first signs of an indisposition which is the harbinger of more serious trouble.
d) By better appreciation of the unjustified confidence that one puts in equipment which does not conform to regulations and which is not safe: the plastic air floaters of all sorts, air mattresses, the fragile boats which are flooding the markets now-a-days and which are responsible for countless accidents each year.
The basis of any form of rational prevention would seem to be the systematic teaching of people to swim, a preventive measure which is both public and individual.