

deterioration in the condition of your patient is caused by obstruction of the tube with his secretions. The ET tube is partially occluded and the patient must be suctioned. After securing the casualty's airway with an ET tube you set and providing him with pure, high-flow oxygen into his lungs, his condition improves markedly.

1. Is the casualty's airway open?
2. How will you perform an initial assessment of this patient?
3. What immediate management is indicated for him?
4. Is he breathing adequately? Why not?
5. What are the signs and symptoms of inadequate artificial ventilation?
6. Why is your patient's condition not improving with assisted ventilation?
7. Why are BVM ventilations ineffective?
8. How will you remedy the predicament?

F. Speaking

Give a face-to-face report to the doctor on duty upon arrival at the hospital including:

- the rescue actions you have taken on the way to the ED,
- the changes to the victim's vital signs and condition you have registered.

Unit 5

DIAGNOSTIC AND THERAPEUTIC EQUIPMENT

A. Warm-up

Cardiac arrest is one of the most common emergencies. With advances in medical equipment and first aid techniques, cardiac arrest victims have a better chance to survive these days.

Working in pairs or threes try to answer the questions which follow:

When should an AED be used, in case of what patients?

How can an AED help a cardiac arrest patient?

Can an AED be used by anybody or only by a qualified rescuer?

Where should AEDs be made available?

Why is time an essential factor in the application of an AED?

Compare your answers and sum up the information/opinions collected.

Task 2

Arrange the order of the instructions for using AED.

- A. () Attach the pads (electrodes) of the AED firmly to the victim's chest.
- B. () Place the AED near the victim's left shoulder.
- C. () Expose the victim's chest.
- D. () Let the AED unit analyse the victim's heart rhythm.
- E. () Turn the AED unit on.
- F. () Check the victim for breathing.
- G. () Follow the AED unit's instructions/prompts.
- H. () Make sure the victim is not in contact with water or metal.

Task 3

Complete the text with the words and phrases given below. Then mark the statements which follow (T) true or (F) false.

diagnostic and therapeutic • defibrillation guidelines • manual override • automated external defibrillation • defibrillation guidelines • appropriate electrical therapy • electrical energy • loss of time • blood pressure • mid-1950s • 19th century • early 60s • how to recognize • depolarize • charge • induce • diagnose • terminate • analyse • re-establish • deliver • 10–20 seconds • high joule shocks • oxygen saturation • procedure • electrocardiogram • portable • cardiac condition • without analysing • out-of-hospital

Delivering a therapeutic dose of to a heart affected by life-threatening cardiac arrhythmias, ventricular fibrillation and pulseless ventricular tachycardia can a critical mass of the heart muscle, the arrhythmia and the normal sinus rhythm in the sino-atrial node of the heart. A special device – a defibrillator – has been developed to effect this called defibrillation.

The idea of applying small electric shocks to ventricular fibrillation was first explored on animals at the end of the to be later used with varying effectiveness on the exposed hearts of humans. It was not until that the first closed-chest defibrillator was developed and applied.

A real progress came in the with the development of defibrillators which could be used in settings and carried by ambulances. The improvements which followed have led to the availability of the now widely known and used Their great advantage is that these computer-technology-based units can be used even by lay people as they can the heart rhythm, the shockable rhythm and an adequate shock charge all by themselves. They are usually designed to deliver for VF and VT rhythms. Their disadvantage is that they take to diagnose the rhythm which means which is of primary importance in cardiac arrest related cases. That's why recent recommend two CPR after each shock the cardiac rhythm and the use of manual or semi-automated external defibrillators

Manual external defibrillators are provided with which allow trained medical personnel to diagnose the and decide what to apply. Semi-automated external defibrillators, frequently used by pre-hospital care professionals, have the features of the AED but also an ECG display and which allows the operator to make their own decisions. In addition to their primary function some models are also capable of measuring and blood Paramedics are taught and trained life-threatening arrhythmias, what to deliver and also how to make best use of the ever more advanced equipment available.

1. A dose of electrical energy can restore the normal sinus rhythm of the heart.
2. A defibrillator is a device which makes the heart beat.
3. The idea of applying electric shocks to induce ventricular fibrillation is over a hundred years old.
4. The technique of defibrillation was first developed and long performed as an open-heart procedure.
5. The first portable defibrillator did not appear until the mid 1950s.
6. AEDs have a number of functions.
7. AEDs can replace paramedics.
8. AEDs are not all that perfect.
9. Paramedics are not recommended to always use and fully rely on AEDs.
10. The AED is not the only type of defibrillator available.
11. With manual or semi-automated defibrillators the final decision belongs to the paramedic.
12. The operation and application of defibrillators is part of standard paramedic education and training.
13. Irrespective of the AED type the basic sequence of steps for using it is the same.
14. Many contemporary models of AEDs measure the casualty's blood pressure and blood oxygen saturation.
15. The fully automatic AEDs assess the patient's heart rhythm and a potential presence of VT, charge the paddles and deliver countershocks without any intervention by the medical rescuer.

C. Listening

Task 4

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Listen to the conversation. Decide whether the following statements are true (T) or false (F). Justify your opinion.

1. The man was lucky that there were medical professionals present.
2. The accident occurred in a public place.
3. The first responders were aware that fast action was essential.
4. The victim did not receive CPR.
5. The responders delivered three AED shocks.
6. The responders knew how to proceed.
7. Their action seems to have been successful.
8. Paramedics were fast to appear on the scene.
9. The first responders delivered AED shocks and CPR simultaneously.
10. The responders reported an emergency to the paramedics who arrived promptly on the scene.

D. Vocabulary Practice

Task 5

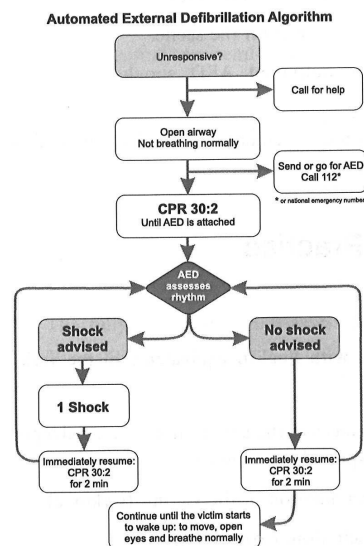
Complete the instructions with English equivalents of the verbs given in brackets.

1. if the circumstances at the site do not a danger to you or the victim. (sprawdź; stanowią)
2. the primary examination of the victim. (wykonaj)
3. resuscitation. (rozpocznij)

4. the semi-automated defibrillator to the heart rhythm. (użyć; zanalizować)
5. the condition and the most appropriate charge to be used. (dokonać rozpoznania; określić)
6. all metal objects from the victim and his/her vicinity. (usuń)
7. the defibrillator. (przygotuj)
8. CPR and the pads on the victim's exposed chest. (zaprześcić; umieścić)
9. two shocks as recommended. (zastosuj)
10. CPR. (wznów)

Task 6

Study the Automated External Defibrillation Algorithm given below. Explain the use of the protocol.



(Źródło: European Resuscitation Council Guidelines, 2010)

Task 7

Make 10 collocations using the following words.

margin • rhythm • placement • pads • current • fibrillation • defibrillator • charge • node • arrhythmias • rib • shockable • electrode • adhesive • monophasic • ventricular • portable • adequate • sinoatrial • cardiac

Follow-up

Prepare and give presentations on the types of defibrillators and their use for two types of audiences.

1. lay people (general public)

2. paramedics

- Prepare a demonstration of a few models of defibrillators.
- Arrange a simulation of a situation in which the use of a defibrillator would be recommended.

E. More Reading

Task 8

Read the text and answer the questions.

Another device constituting standard equipment of an emergency ambulance is a pulse oximeter (saturometer), a medical device that indirectly monitors the oxygen saturation of a patient's blood and changes in blood volume in the skin. Oximeters are usually portable and battery-operated but they can also be attached to a medical monitor which also allows to follow the patient's oxygenation at all times. Most monitors also display the heart rate.

A blood-oxygen monitor displays the percentage of arterial haemoglobin in the oxyhaemoglobin configuration. Acceptable normal ranges for patients without COPD with a hypoxic drive

Vocabulary

oxygenation natlenowanie,
nasylenie tlenem
carbon monoxide poisoning
zatrucie tlenkiem węgla
discern dostrzec, zauważyć
thrive prawidłowo rozwijać się
unwarranted nieuzasadniony
impaired zaburzony
earlobe małżowina uszna,
płatek uszny
pose danger stanowić
zagrożenie
hypoxic driver problem ze
skłonnością do niedotlenienia

problem are from 95 to 99 percent, those with a hypoxic drive problem would expect values to be between 88 to 94 percent, values of 100 percent can indicate carbon monoxide poisoning. For a patient breathing room air, an estimate of arterial SpO₂ can be made from the blood-oxygen monitor SpO₂ reading.

A pulse oximeter is a convenient noninvasive measurement instrument, typically attached to a fingertip or an earlobe of the patient. The monitored signal follows the heart beat because the arterial blood vessels expand and contract with each heartbeat. By examining only the varying part of the absorption spectrum a monitor can ignore other tissues or/and discern only the absorption caused by arterial blood. Detecting a pulse is essential to the operation of a pulse oximeter and it will not function if there is none.

A pulse oximeter is useful in any setting where a patient's oxygenation is unstable, including emergency settings, for assessment of any patient's oxygenation and determining the effectiveness of or need for supplemental oxygen. Assessing a patient's need for oxygen is the most essential element to life; no human life thrives in the absence of oxygen (cellular or gross). Although a pulse oximeter is used to monitor oxygenation, it cannot determine the metabolism of oxygen, or the amount of oxygen being used by a patient. For this purpose, it is necessary to also measure carbon dioxide (CO₂) levels. It is possible that it can also be used to detect abnormalities in ventilation. However, the use of a pulse oximeter to detect hypoventilation is impaired with the use of supplemental oxygen, as it is only when patients breathe room air that abnormalities in respiratory function can be detected reliably with its use. Therefore, the routine administration of supplemental oxygen may be unwarranted if the patient is able to maintain adequate oxygenation in room air, since it can result in hypoventilation going undetected.

Because of their simplicity and speed, pulse oximeters are of critical importance in emergency medicine and are also very useful for patients with respiratory or cardiac problems, especially COPD.

1. What is a pulse oximeter? What purpose does it serve?
2. Are pulse oximeters easy to use?
3. What does the oximeter monitor display?
4. What are acceptable, normal readings of the oximeter?
5. What values are indicative of problems?
6. Where is the oximeter usually applied and why?
7. Why is it essential to detect the pulse?
8. When is pulse oximetry of particular importance?
9. Why is the supply of the organism with oxygen vital?
10. Can an oximeter detect hypoventilation?
11. Are there any limitations as to the use of an oximeter?
12. When is supplemental oxygenation not fully recommended?

Task 9

Complete the questions with English equivalents of the Polish verbs given in brackets.

1. What does the monitor? (pokazuje)
2. Where shall I the oximeter? (podłączyć)
3. Can you the pulse? (wykryć)
4. What should I do if I the patient's oxygenation unstable? (stwierdzić, że)
5. Will the device actually help me the victim's need for oxygen? (ocenić)
6. Can an oximeter the metabolism of oxygen? (określić)
7. Can an oximeter the amount of oxygen used by the patient? (oszacować)
8. Would it help if we could carbon dioxide levels? (zmierzyć)

9. Can the use of supplemental oxygen ventilation.
(zaszkodzić)
10. And what if the patient can on his own? Shall we
..... supplemental oxygen or not? (oddychać; podać)

Task 10

Complete the sentences with English equivalents of the Polish phrases given in brackets.

1. We must monitor (poziom tlenu we krwi)
2. The monitor will show us in the skin.
(zmiany ilości krwi)
3. exceeding 100% indicate
(wartości; zatrucie tlenkiem węgla)
4. I'll give you the oximeter (odczyty)
5. Attach the oximeter to the patient's (małżowina uszna)
6. What does the unit say about (poziom tlenu we krwi)
7. Is the use of really necessary? (dodatkowy tlen)
8. Have you noticed any (nieprawidłowości w dostarczaniu tlenu do płuc)
9. The is not yet impaired.
(czynności oddychania)
10. What will he need? (ilość tlenu)

Task 11

Using the text as a starting point and your specialist knowledge to support you, explain how a pulse oximeter is used for:

1. Monitoring the oxygenation of a patient during an intubation attempt or during suctioning.
2. Identifying deterioration in a trauma victim.
3. Assessing vascular status in orthopaedic trauma.
4. Identifying high-risk patients with respiratory problems.
5. Identifying deterioration in the cardiac patient.

Task 12

What do the following abbreviations stand for?

AED • AF • BP • CPR • COPD • ECG • PAD • PEA • PVT • SpO₂

F. Follow-up

1. Prepare and deliver a presentation on the diagnostic equipment at the disposal of paramedics in Poland.
2. Prepare and deliver a presentation on the therapeutic equipment available to paramedics in the pre-hospital setting.
3. Prepare demonstrations of selected diagnostic and therapeutic devices addressed to future paramedics.