

2. Prepare a mini-presentation on suction devices and their use accompanied by a demonstration (and/or a visual).
3. Prepare a mini-presentation addressed to future paramedics on the intubation procedure.
4. Prepare mini-presentations on different intubation-related devices with the purpose of showing how they should be used, in what situation, etc.
5. Prepare simulations of situations in which you perform suctioning or intubation.

# Unit 4

## OXYGEN ADMINISTRATION

### A. Warm-up

Advances in medical sciences concern also development of new technologies, techniques, equipment and devices which help to save human life in numerous circumstances, including situations when the supply of oxygen to the organism is depleted.

**Working in pairs or threes discuss:**

- what difficulties a paramedic may encounter in administering oxygen to an emergency patient,
- what equipment and devices can be of assistance to a paramedic in overcoming these difficulties and administering oxygen,
- what you already know about their application.

**Compare your answers and share the information with the whole group.**

## B. Reading and Vocabulary Building

### PART ONE

#### Task 1

Read the text and complete it with the words given in the box.

obstruct • fit • cause • keep • remain • prevent • inserted • opened  
• breathing • obstructing • maintaining • sealing • receiving

One of the important elements of resuscitation is to ..... a victim's airways open throughout the procedure, in particular to ..... the tongue from ..... airways. Proper head positioning may not be enough. Special devices, referred to as airway adjuncts, have been developed to assist EMS in ..... open airways. Once they are inserted, they can ..... in place while the victim's breathing is taking care of. Two types of airway adjuncts are distinguished: oral airways and nasal airways.

Oral airways, also called oropharyngeal airways, can be ..... when the victim is unresponsive and has no gag reflex provided the airway is first ..... The device keeps airways open in an unresponsive victim also when he/she is ..... or is ..... rescue breaths. The device fits in shape of the natural contour of the mouth and comes in different sizes. This is important as it should ..... properly if it is not to ..... vomiting, prevent the resuscitation mask from ..... well or ..... the airway by moving to the back of the pharynx. Suction can be performed while an oral airway is in place.

#### Task 2

Mark the following statements T (true) or F (false). Justify your opinion.

1. Obstruction of a victim's airways does not interfere with resuscitation procedures.
2. The rescuer must choose the proper size of the oral airway.
3. Airway adjuncts are medications given to support the resuscitation procedure.
4. Repositioning of the victim's head may not suffice to maintain the airways open.
5. The presence of a gag reflex does not allow to insert an oral airway.
6. An ill-fitting device can jeopardize resuscitation.
7. The use of an oral airway is no longer necessary when rescue breaths are given.

#### Task 3

Arrange the steps of the oral airway insertion procedure in the proper order.

- A. ( ) Use the head tilt chin lift or jaw-thrust to open the victim's airways.
- B. ( ) Rotate the airway 180 degrees when you feel resistance, i.e. when the tip of the device has reached the back of the oral cavity.
- C. ( ) Insert the device into the mouth. Its tip should point toward the roof of the mouth.
- D. ( ) Choose an airway of a proper size, neither too small nor too big.
- E. ( ) Continue to insert the airway until its flange is resting on the victim's lips.
- F. ( ) Open the victim's mouth.

### Vocabulary

airway adjuncts urządzenia wspomagające oddychanie  
suffice wystarczyć  
ill-fitting device źle dopasowane urządzenie  
head tilt odchylenie głowy  
chin lift uniesienie żuchwy  
jaw thrust wysunięcie żuchwy  
resistance opór  
roof of the mouth podniebienie  
teeth clenching zaciśnięcie zębów  
lubricant środek nawilżający  
gauge licznik  
calibrated flow valve wentyl dozowania przepływu  
oxygen tube rurka doprowadzająca tlen  
prongs rurka donosowa „wąsy tlenowe”

- oxygen tubing (5–4 feet long tubes with an adapter at each end) to connect the cylinder to the delivery device,
- an oxygen delivery device.

### Task 9

Match the most commonly used oxygen delivery devices (in the box) with their descriptions.

nasal cannula • resuscitation face mask • non-rebreather mask • bag-valve-mask unit

1. .... is used with breathing victims. The concentration of oxygen delivered can range from 80 to 95%. The flow rate being adjustable. It consists of a firmly fitting mask and a reservoir bag. As the victim inhales the oxygen from the bag, the reservoir is refilled. The victim's exhaled air is expelled through a special valve.
2. .... can be used for non-breathing victims receiving rescue breath. It can deliver an oxygen concentration of 30–60% at a flow rate of 10 litres per minute. The device covers the mouth and the nose of the victim. It may have a special oxygen port to be used in breathing victims.
3. .... consists of a self-inflating air or oxygen bag, a one-way valve allowing air or oxygen to flow from the bag to the victim and a mask connected to the bag and the valve. The device can be used with both non-breathing and breathing victims. Oxygen can be delivered to the bag through a connecting tube. Alternatively, an oxygen reservoir can be attached to the other end of the bag. The device with a reservoir can deliver oxygen concentrations of up to 100%. The bag is not squeezed unless breathing difficulty is present.
4. .... is recommended in victims who do not require a high concentration of oxygen (24–50% depending on the victim's breathing rate and the flow rate). Its two prongs are easily placed shallowly in the victim's nose.

### Task 10

Mark the following statements T (true) or F (false). Justify your opinion.

1. Masks are available in different sizes because they must fit properly to be sealed tight.
2. Before placing the BVM mask on the victim's face, the rescuer must first perform a head tilt.
3. The BVM is best operated by two rescuers.
4. An increased resistance felt on squeezing the bag means that the rescuer should squeeze it harder.
5. The bigger the bag the better.
6. The BVM cannot be used with a non-breathing infant.
7. The rise and fall of the victim's chest tell the rescuer how hard to squeeze the bag.
8. The nasal cannula provides high oxygen concentration.
9. The nasal cannula is most beneficial to victims who require short-term oxygen therapy.
10. Non-rebreather mask is used for delivering supplemental oxygen to spontaneously breathing patients in the prehospital setting.

### Task 11

Complete the instructions with the verbs from the box.

cover • make • adjust • place • use • check • connect • squeeze • deliver • fit

1. .... if the victim is breathing.
2. .... an oxygen concentration of 80–90%.
3. .... the flow rate.

4. .... the mask.
5. .... the reservoir bag.
6. Begin to ..... rescue breaths.
7. .... the victim's mouth and nose with the mask.
8. .... the bag harder if necessary.
9. .... sure the mask is sealed tight.
10. .... the prongs of the device in the victim's nose.

## Task 12

Complete the questions with English equivalents of Polish expressions.

1. What ..... would be best in this case?  
(stężenie tlenu)
2. What ..... should I choose? (tempo przepływu)
3. Shall I perform a ..... first? (odchylenie głowy)
4. And what if I feel .....? (zwiększony opór)
5. Shall I check the victim's .....? (tempo oddychania)
6. Is the device equipped with .....? (samonapelniający się worek)
7. Is there a ..... showing the pressure in the cylinder?  
(licznik)
8. Can I insert the device when a ..... is present?  
(odruch wymiotny)
9. Should I attach the oxygen connective tubing to the  
.....? (regulator przepływu tlenu)
10. Will you apply an .....?  
(automatyczny respirator transportowy)

## Task 13

Complete the sentences with English equivalents of Polish expressions.

1. Manual airway manoeuvres include the .....  
(odchylenie głowy, uniesienie żuchwy, wysunięcie żuchwy) and the tongue-jaw lift.
2. Regardless of the casualty's condition, his or her .....  
(drogi oddechowe muszą pozostać drożne) all the time.
3. Clearing the airway means .....  
(usunięcie blokującego oddychanie materiału)
4. Maintain the airway open with .....  
(urządzenia wspomagające oddychanie)
5. Basic airway adjuncts include ..... and  
..... (maska ustno-gardłowa, maska nosowo-gardłowa)
6. .... (prawidłowe oddychanie) features among others ..... (prawidłowa pojemność oddechowa), symmetrical ..... (unieśnienie klatki piersiowej) and a regular pattern of ..... and ..... (wdechu, wydechu).
7. The ..... (aparatury oddechowej o zamkniętym obiegu) is the preferred device for .....  
(podawanie tlenu) to patients who are breathing adequately in the prehospital setting.
8. Patients who are suspected of being hypoxaemic require .....  
(wentylacja zastępcza) via nonrebreathing mask.
9. The methods of providing .....  
(sztuczne oddychanie) include .....  
(metoda usta-maski, metoda usta-usta, metoda usta-nos-usta)

10. .... (przeptyw powietrza na szczycie wydechu) is a fairly reliable assessment of the severity of a victim's bronchoconstriction.

## D. Listening and Reading

### Task 14

24



Listen and mark the statements T (true) or F (false).

1. Sellick's manoeuvre used to be a commonly applied technique.
2. In Sellick's manoeuvre pressure is applied at level of the 6<sup>th</sup> thoracic vertebrae.
3. Sellick's manoeuvre prevents the passage of air to the stomach during anaesthesia.
4. The value of the procedure rests on the fact that it can replace intubation.
5. Research reveals that the application of the technique can significantly impair the patency of the airway.
6. The speaker warns the listeners not to apply the technique indiscriminately.

### Task 15

Read the dialogue between a paramedic and a trainee. Answer the questions which follow.

- P1: How do you feel about inserting an oral airway?
- P2: Not very well. Of course, I was taught how to do it but I've had little experience. The same with nasal airways.
- P1: It's quite simple. Choosing the correct size of the device is the first step.
- P2: Inserting the device is sort of invasive, especially with a nasal airway.

P1: When you lubricate the device, insert it properly and slide it in slowly, it's not so bad.

P2: What do you mean by inserting it properly?

P1: Nothing special. You insert it in the right nostril with the bevel toward the septum and then proceed slowly.

P2: Oral airway inserting seems easier.

P1: It's all the question of knowledge and practice. The victim must be put in the right position, the device inserted with the tip pointing to the roof of the mouth.

P2: You push it until you feel resistance, don't you?

P1: Yes. It means you've reached the back of the mouth. Only then you rotate the airway by 180 degrees.

P2: That's all?

P1: Not quite. In the insertion of both nasal and oral airways you continue until the flange rests on the nose or the lips.

P2: Sounds simple and clear.

P1: But you need practice. Where time's what matters, you must act fast and efficiently.

1. What is the conversation about?
2. Are both speakers experienced in the airway insertion?
3. Does the choice of the size matter in both cases?
4. How does the trainee feel about the airway insertion?
5. How should a nasal airway be inserted properly?
6. Which way should the bevel point?
7. Which way should the tip of the oral airway point?
8. When does the paramedic know that the insertion is finished?
9. Must the device be rotated in both cases?
10. Where should the flange be at the end of the insertion?

Explain the importance of the tips given by the experienced paramedic.

### Task 16

25



Listen to the at-site conversation between two paramedics and mark the statements T (true) or F (false).

1. The victim's condition is critical.
2. The paramedics check the oxygen cylinder for safety first.
3. The concentration chosen is 70–80%.
4. The flow rate is immaterial.
5. There may be a need to change the oxygen tank.

### Task 17

25



Listen again. Report what has been done.

### Task 18

Read the passage below and complete it with the verbs given in the box.

spine • trachea • tracheal • glottis • technique • pressure • aspect • lungs • oesophagus

Sellick's manoeuvre is a ..... of preventing air from passing to the stomach by applying cricoid pressure on the ..... and compressing the ..... against the ..... The risk of aspiration, the movement of vomit, fluids or solids to the ..... may thus be reduced during rescue breathing. Sellick's manoeuvre should not be confused with the BURP (Backwards Upwards Rightwards Pressure) manoeuvre which also involves digital ..... to the anterior ..... of the laryngeal apparatus, the purpose of which is to improve the view of the ..... during laryngoscopy and ..... intubation.

### Task 19

On the basis of the text above as well as your knowledge, discuss which of the following statements is true (T) and which false (F). Justify your opinion.

1. Sellick's manoeuvre can be performed on both responsive and unresponsive victims.
2. Sellick's manoeuvre cannot be used by an untrained rescuer.
3. Sellick's manoeuvre replaces CPR chest compressions.
4. Sellick's manoeuvre is used only with adult victims.
5. The pressure is applied above the victim's so called Adam's apple.
6. The pressure applied with the index finger and thumb varies depending on the victim.
7. The pressure must be maintained as long as rescue breathing is continued.
8. Sellick's manoeuvre is regarded as non-invasive emergency procedure.
9. The technique is strongly recommended for victims suffering from cervical spine injury.
10. The cricoid pressure procedure is similar to BURP manoeuvre.

#### Follow-up

Give a mini-presentation describing and demonstrating Sellick's manoeuvre.

### Task 20

Arrange the steps of the oxygen administration procedure in the correct order.

- A. ( ) remove protective seals (if any) and attach the regulator to the oxygen cylinder
- B. ( ) check the pressure regulator gauge

- C. ( ) attach the tubing to the flow meter and the oxygen delivery device
- D. ( ) confirm oxygen flowing
- E. ( ) check the equipment (the oxygen labels on the cylinder and regulator, the readiness of the tubing and the delivery device)
- F. ( ) set the flow meter at the correct oxygen flow rate
- G. ( ) monitor the pressure regulator gauge and be prepared to remove the delivery device and change oxygen tanks
- H. ( ) remove the protective seal, point the cylinder away and open the main valve for a second
- I. ( ) position the delivery device on the victim and continue rescue breathing if the victim cannot breathe spontaneously
- J. ( ) open the main cylinder valve

### Task 21

Write the correct oxygen flow rate for each of the devices:

- 1. nasal cannula ..... lpm
- 2. face mask ..... lpm
- 3. bag-valve-mask unit or non-rebreather mask ..... lpm

### Follow-up

- Design and present a plan of a training in the use of airway adjuncts.
- Prepare a demonstration of selected airway adjuncts, including an instruction how to use them.
- Design and present a plan of a training in the use of oxygen delivery devices.
- Prepare a demonstration of selected oxygen delivery devices.

## E. Case Study

Follow and discuss the case presented below. Read it carefully and describe how the paramedics handled the victim in the ambulance *en route* to hospital, what they may have found out, what they may have administered the victim and how the victim's condition might have developed.

### Task 22

Read the description of the situation you find upon arrival on the site and answer the questions below.

You are dispatched to a mall for a 65-year-old male with difficulty breathing.

Your team reaches the scene in approximately five minutes. On arrival you find a man sitting on the bench in front of the mall. During initial assessment he is experiencing mild respiratory distress, but is conscious, alert and his airway seems to be patent at this time. Closer examination of the casualty reveals that he has increased respiratory rate, laboured breathing, mild use of accessory muscles and intercostal recession. His radial pulse is rapid and bounding. You apply a non-rebreather mask on the casualty's mouth and set the flow rate at 15 l/min. During physical examination, you notice that your patient's level of consciousness has diminished and cyanosis is developing around his lips and nail beds. As his respirations become rapid (38 breaths/min), uneven, shallow and gurgling, you are assisting his breathing with a bag-valve-mask device and oxygen at 25 l/min attached to the reservoir bag. The second ambulance crew arrives at the scene and two colleagues help you to load the casualty into your ambulance, where you attach your patient to a cardiac monitor, establish IV line and begin prompt transport to hospital.

On the way to hospital you continue to assist the casualty's ventilations with the BVM device and supplemental oxygen, but you are having problems maintaining an adequate mask-to-face seal with the BVM device. Your patient looks worse. Acute

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.