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BASIC LIFE SUPPORT

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ABSTRACT
Basic life support is an integral part of the learning curve in a clinicians life. Knowledge of this is important to every healthcare professional. It helps to deal with the emergencies arising with airway and breathing. A thorough knowledge of it can help saving the life of a patient in distress. It can pan out to be the critical element in saving a life of an individual.

INTRODUCTION
Basic life support is the maintenance of an airway and the support of breathing and the circulation without using equipment other than a simple airway device or protective shield.[1]

Basic life support is one link in this chain of survival. It entails assessment followed by action— the ABC: A is for assessment and airway, B is for breathing, and C is for circulation.[1]

The purpose of BLS is to maintain adequate ventilation and circulation until a means can be obtained to reverse the underlying cause of the arrest. It is therefore a "holding operation", although on occasion, particularly when the primary pathology is respiratory failure, it may itself reverse the cause and allows full recovery.[1]

History
1732 - In Alloa, Scotland, local surgeon William Tossach uses mouth-to-mouth breaths to revive a suffocated coal-pit miner. Dr. Tossach documents the success 12 years later, in what may be the first clinical description of mouth-to-mouth resuscitation in medical literature.

1856 - London physician Marshall Hall introduces his simple resuscitation technique: alternately repositioning the patient from face up to side. He updates the approach by adding pressure on the thorax.[2]

1891 - After using external compressions to restart the hearts of 2 young human patients, German surgeon Dr. Friedrich Mass becomes the first to advocate chest compressions, rather than ventilation alone, to help with circulation.[3]

1947 - In Cleveland, Ohio, cardiothoracic surgeon Dr. Claude Beck performs the first successful use of an electric defibrillator on an exposed human heart.[4]

1956 - Dr. Elam and Dr. Peter Safar prove that mouth-to-mouth resuscitation is an effective lifesaving method.[5]

2005 - The AHA develops the Family & Friends® CPR Anytime® kit, an innovative product that enables anyone to learn the core skills of CPR in just 20 minutes. The kit provides everything needed to learn basic CPR, AED skills, and choking relief anywhere, from a family room at home to a setting for instructing large groups.

Basic Life Support (BLS)
Basic life support comprises the following elements:

1. Initial assessment
2. Airway maintenance
3.Cardiopulmonary Resuscitation (CPR).

Assessment
Establish whether the patient is responsive by gently shaking his or her shoulders and asking loudly "Are you all right?" Be careful not to aggravate any existing injury, particularly of the cervical spine.[1]

Loosen tight clothing around the patient's neck. Extend, but do not hyperextend, the neck, thus lifting the tongue off the posterior wall of the pharynx. This is best achieved by placing your hand on the patient's upper forehead and exerting pressure to tilt the head.

If the patient is unresponsive and his or her airway is not open, you need to open the airway. Two methods may be used:
A. Head-tilt/chin-lift technique
B. Modified jaw-thrust manoeuvre, if a head, neck or spinal injury is suspected

Head-tilt/chin-lift technique[1]
To perform the head-tilt/chin lift technique on an adult:
A. Press down on the forehead while pulling up on the bony part of the chin with two to three fingers of the other hand.
B. For adults, tilt the head past a neutral position to open the airway while avoiding hyperextension of the neck.

Modified jaw-thrust manoeuvre[9]
The modified jaw-thrust manoeuvre is used to open the airway when a patient is suspected of having a head, neck or spinal injury. To perform this manoeuvre on an adult, kneel above the patient's head and:
A. Put one hand on each side of the patient's head with the thumbs near the corners of the mouth pointed toward the chin, using the elbows for support.
B. Slide the fingers into position under the angles of the patient's jawbone without moving the head or neck.
C. Thrust the jaw upward without moving the head or neck to lift the jaw and open the airway

If breathing is absent, send a bystander to telephone for an ambulance. If you are on your own, go yourself.
A. Return to the patient and maintain an airway by tilting the head and lifting the chin.
B. Pinch the nose closed with the fingers of your hand on the forehead.
C. Take a breath, seal your lips firmly around those of the patient, and breathe out until you see the patient's chest clearly rising. It is important for each full breath to last about two seconds. Lift your head away, watching the patient's chest fall, and take another breath of air. The chest should rise as you blow in and fall when you take your mouth away. Each breath should expand the patient's chest visibly but not cause over inflation as this will allow air to enter the oesophagus and stomach.
D. If the patient is still not breathing after two rescue breaths (or after five attempts at ventilation, even if unsuccessful), check for signs of a circulation. Look and listen for any movement, breathing (other

than an occasional gasp), or coughing. Take no more than 10 seconds to make your check.
E.So, feel for a pulse as part of your check for signs of a circulation. If no signs of a circulation are present continue with rescue breaths but recheck the circulation after every 10 breaths or about every minute.

Circulation

If there are no signs of a circulation (cardiac arrest) it is unlikely that the patient will recover as a result of CPR alone, so defibrillation and other advanced life support are urgently required. Cardiopulmonary resuscitation circulates blood that contains oxygen to the vital organs of a patient in cardiac arrest when the heart and breathing have stopped. It includes chest compressions and ventilations as well as the use of an automated external defibrillator.

Compressions

One component of CPR is chest compressions. To ensure optimal patient outcomes, high-quality CPR must be performed. You can ensure high-quality CPR by providing high-quality chest compressions, making sure that the:
A. Patient is on a firm, flat surface to allow for adequate compression. In a non-healthcare setting this would typically be on the floor or ground, while in a healthcare setting this may be on a stretcher or bed with a CPR board or CPR feature applied.
B. The chest is exposed to ensure proper hand placement and the ability to visualize chest recoil.
C. Hands are correctly positioned with the heel of one hand in the center of the chest on the lower half of sternum with the other hand on top. Most rescuers find that interlacing their fingers makes it easier to provide compressions while keeping the fingers off the chest.
D. Arms are as straight as possible, with the shoulders directly over the hands to promote effective compressions. Locking elbows will help maintain straight arms.

Compressions are given at the correct rate of at least 100 per minute to a maximum of 120 per minute, and at the proper depth of at least 2 inches for an adult to promote adequate circulation.

E. The chest must be allowed to fully recoil between each compression to allow blood to flow back into the heart following the compression.

For adult patients, CPR consists of 30 chest compressions followed by 2 ventilations.

Ventilations supply oxygen to a patient who is not breathing. They may be given via several methods including:
A. Mouth-to-mouth.
B. Pocket mask.
C. Bag-valve-mask (BVM) resuscitator.

During adult CPR, you give 2 ventilations that last approximately 1 second each and make the chest rise.

Special Considerations: Advanced Airways

When a patient has an advanced airway such as a supraglottic airway device or an endotracheal tube, CPR must be performed a little differently. At a minimum, two rescuers must be present. One rescuer gives 1 ventilation every 6 to 8 seconds, which is about 8 to 10 ventilations per minute. At the same time, the second rescuer continues giving compressions at a rate of 100 to 120 compressions per minute. There is no pause between compressions or ventilations and rescuers do not use the 30 compressions to 2 ventilations ratio. This process is a continuous cycle of compressions and ventilations with no interruption.

Recovery Positions

The modified H.A.IN.E.S. recovery position is used for situations in which the patient is suspected of having a head, neck or spinal injury; the rescuer is alone and must leave the patient; or the rescuer is unable to maintain an open and clear airway because of fluid or vomit. To place a patient in the modified H.A.IN.E.S. recovery position, do the following:
1. Kneel at the side of the patient and roll the patient toward the rescuer.
2. Place the top leg on the other with both knees in a bent position.
3. Align the arm on top with the upper body.

If the patient is an infant, follow these steps:
1. Carefully position the infant face-down along the forearm.
2. Support the infant's head and neck with your other hand while keeping the infant's mouth and nose clear.
3. Keep the head and neck slightly lower than the chest.

Automated External Defibrillator

Automated external defibrillators (AEDs) are portable electronic devices that automatically analyze the patient's heart rhythm and can provide defibrillation, an electrical shock that may help the heart re-establish a percussing rhythm. When a patient experiences a cardiac arrest, an AED should be applied as soon as one is readily available. By using an AED early, the patient's chances of survival are greatly increased. If you are alone and an AED is available, you should use it once you have determined the patient is in cardiac arrest.

However, take steps to make sure that the patient is as dry as possible, is sheltered from the rain, is not lying in a pool or puddle of water and his or her chest is completely dry before attaching the pads. Also make sure that you and other rescuers are not in contact with water when operating the AED. Do not delay defibrillation when taking steps to create a dry environment. The same is true for metal surfaces.

It is also safe to use AEDs on patients who have pacemakers, other implantable cardioverter defibrillators or metal body piercings. For an AED to work properly, it is important that the pads are attached securely to the patient's chest. If the chest hair is excessive (typically on the right upper chest), quickly shave the right upper chest area before applying the AED pads for better skin contact.

CONCLUSION

Medical emergencies, whatever is the cause, must be recognized quickly and managed effectively. After correct diagnosis, prompt appropriate management will deal with medical emergencies effectively. BLS helps in dealing with these emergency situations.

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