Defibrillator Airway

Automated external defibrillator

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An automated external defibrillator (AED) is a portable electronic device that automatically diagnoses the life-threatening cardiac arrhythmias of ventricular fibrillation (VF) and pulseless ventricular tachycardia, and is able to treat them through defibrillation, the application of electricity which stops the arrhythmia, allowing the heart to re-establish an effective rhythm.

With simple audio and visual commands, AEDs are designed to be simple to use for the layperson, and the use of AEDs is taught in many first aid, certified first responder, and basic life support (BLS) level cardiopulmonary resuscitation (CPR) classes.

The portable version of the defibrillator was invented in the mid-1960s by Frank Pantridge in Belfast, Northern Ireland and the first automatic, public-use defibrillator was produced by the Cardiac Resuscitation Company in the late 1970s. The unit was launched under the name Heart-Aid.

Cardiac arrest

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Cardiac arrest (also known as sudden cardiac arrest [SCA]) is a condition in which the heart suddenly and unexpectedly stops beating. When the heart stops, blood cannot circulate properly through the body and the blood flow to the brain and other organs is decreased. When the brain does not receive enough blood, this can cause a person to lose consciousness and brain cells begin to die within minutes due to lack of oxygen. Coma and persistent vegetative state may result from cardiac arrest. Cardiac arrest is typically identified by the absence of a central pulse and abnormal or absent breathing.

Cardiac arrest and resultant hemodynamic collapse often occur due to arrhythmias (irregular heart rhythms). Ventricular fibrillation and ventricular tachycardia are most commonly recorded. However, as many incidents of cardiac arrest occur out-of-hospital or when a person is not having their cardiac activity monitored, it is difficult to identify the specific mechanism in each case.

Structural heart disease, such as coronary artery disease, is a common underlying condition in people who experience cardiac arrest. The most common risk factors include age and cardiovascular disease. Additional underlying cardiac conditions include heart failure and inherited arrhythmias. Additional factors that may contribute to cardiac arrest include major blood loss, lack of oxygen, electrolyte disturbance (such as very low potassium), electrical injury, and intense physical exercise.

Cardiac arrest is diagnosed by the inability to find a pulse in an unresponsive patient. The goal of treatment for cardiac arrest is to rapidly achieve return of spontaneous circulation using a variety of interventions including CPR, defibrillation or cardiac pacing. Two protocols have been established for CPR: basic life support (BLS) and advanced cardiac life support (ACLS).

If return of spontaneous circulation is achieved with these interventions, then sudden cardiac arrest has occurred. By contrast, if the person does not survive the event, this is referred to as sudden cardiac death. Among those whose pulses are re-established, the care team may initiate measures to protect the person from brain injury and preserve neurological function. Some methods may include airway management and

mechanical ventilation, maintenance of blood pressure and end-organ perfusion via fluid resuscitation and vasopressor support, correction of electrolyte imbalance, EKG monitoring and management of reversible causes, and temperature management. Targeted temperature management may improve outcomes. In post-resuscitation care, an implantable cardiac defibrillator may be considered to reduce the chance of death from recurrence.

Per the 2015 American Heart Association Guidelines, there were approximately 535,000 incidents of cardiac arrest annually in the United States (about 13 per 10,000 people). Of these, 326,000 (61%) experience cardiac arrest outside of a hospital setting, while 209,000 (39%) occur within a hospital.

Cardiac arrest becomes more common with age and affects males more often than females. In the United States, black people are twice as likely to die from cardiac arrest as white people. Asian and Hispanic people are not as frequently affected as white people.

Airway management

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Airway management includes a set of maneuvers and medical procedures performed to prevent and relieve an airway obstruction. This ensures an open pathway for gas exchange between a patient's lungs and the atmosphere. This is accomplished by either clearing a previously obstructed airway; or by preventing airway obstruction in cases such as anaphylaxis, the obtunded patient, or medical sedation. Airway obstruction can be caused by the tongue, foreign objects, the tissues of the airway itself, and bodily fluids such as blood and gastric contents (aspiration).

Airway management is commonly divided into two categories: basic and advanced.

Basic techniques are generally non-invasive and do not require specialized medical equipment or advanced training. Techniques might include head and neck maneuvers to optimize ventilation, abdominal thrusts, and back blows.

Advanced techniques require specialized medical training and equipment, and are further categorized anatomically into supraglottic devices (such as oropharyngeal and nasopharyngeal airways), infraglottic techniques (such as tracheal intubation), and surgical methods (such as cricothyrotomy and tracheotomy).

Airway management is a primary consideration in the fields of cardiopulmonary resuscitation, anaesthesia, emergency medicine, intensive care medicine, neonatology, and first aid. The "A" in the ABC treatment mnemonic is for airway.

Cardiopulmonary resuscitation

automated defibrillator (AED), but only if the AED is available within a few minutes. Attempting defibrillation with the automated external defibrillator (AED)

Cardiopulmonary resuscitation (CPR) is an emergency procedure used during cardiac or respiratory arrest that involves chest compressions, often combined with artificial ventilation, to preserve brain function and maintain circulation until spontaneous breathing and heartbeat can be restored. It is recommended for those who are unresponsive with no breathing or abnormal breathing, for example, agonal respirations.

CPR involves chest compressions for adults between 5 cm (2.0 in) and 6 cm (2.4 in) deep and at a rate of at least 100 to 120 per minute. The rescuer may also provide artificial ventilation by either exhaling air into the subject's mouth or nose (mouth-to-mouth resuscitation) or using a device that pushes air into the subject's lungs (mechanical ventilation). Current recommendations emphasize early and high-quality chest

compressions over artificial ventilation; a simplified CPR method involving only chest compressions is recommended for untrained rescuers. With children, however, 2015 American Heart Association guidelines indicate that doing only compressions may result in worse outcomes, because such problems in children normally arise from respiratory issues rather than from cardiac ones, given their young age. Chest compression to breathing ratios are set at 30 to 2 in adults.

CPR alone is unlikely to restart the heart. Its main purpose is to restore the partial flow of oxygenated blood to the brain and heart. The objective is to delay tissue death and to extend the brief window of opportunity for a successful resuscitation without permanent brain damage. Administration of an electric shock to the subject's heart, termed defibrillation, is usually needed to restore a viable, or "perfusing", heart rhythm. Defibrillation is effective only for certain heart rhythms, namely ventricular fibrillation or pulseless ventricular tachycardia, rather than asystole or pulseless electrical activity, which usually requires the treatment of underlying conditions to restore cardiac function. Early shock, when appropriate, is recommended. CPR may succeed in inducing a heart rhythm that may be shockable. In general, CPR is continued until the person has a return of spontaneous circulation (ROSC) or is declared dead.

Basic life support

advance in providing BLS is the availability of the automated external defibrillator or AED. This improves survival outcomes in cardiac arrest cases. One

Basic life support (BLS) is a level of medical care which is used for patients with life-threatening condition of cardiac arrest until they can be given full medical care by advanced life support providers (paramedics, nurses, physicians or any trained general personnel). It can be provided by trained medical personnel, such as emergency medical technicians, qualified bystanders and anybody who is trained for providing BLS and/or ACLS.

Choking

Those defibrillators are easy to use, as they emit their instructions with voice messages. It is crucial to avoid blindingly sweeping the airway unless

Choking, also known as foreign body airway obstruction (FBAO), is a phenomenon that occurs when breathing is impeded by a blockage inside of the respiratory tract. An obstruction that prevents oxygen from entering the lungs results in oxygen deprivation. Although oxygen stored in the blood and lungs can keep a person alive for several minutes after breathing stops, choking often leads to death.

Around 4,500 to 5,000 choking-related deaths occur in the United States every year. Deaths from choking most often occur in the very young (children under three years old) and in the elderly (adults over 75 years). Foods that can adapt their shape to that of the pharynx (such as bananas, marshmallows, or gelatinous candies) are more dangerous. Various forms of specific first aid are used to address and resolve choking.

Choking is the fourth leading cause of unintentional injury death in the United States. Many episodes go unreported because they are brief and resolve without needing medical attention. Of the reported events, 80% occur in people under 15 years of age, and 20% occur in people older than 15 years of age. Worldwide, choking on a foreign object resulted in 162,000 deaths (2.5 per 100,000) in 2013, compared with 140,000 deaths (2.9 per 100,000) in 1990.

First aid

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First aid is the first and immediate assistance given to any person with a medical emergency, with care provided to preserve life, prevent the condition from worsening, or to promote recovery until medical services arrive. First aid is generally performed by someone with basic medical or first response training. Mental health first aid is an extension of the concept of first aid to cover mental health, while psychological first aid is used as early treatment of people who are at risk for developing PTSD. Conflict first aid, focused on preservation and recovery of an individual's social or relationship well-being, is being piloted in Canada.

There are many situations that may require first aid, and many countries have legislation, regulation, or guidance, which specifies a minimum level of first aid provision in certain circumstances. This can include specific training or equipment to be available in the workplace (such as an automated external defibrillator), the provision of specialist first aid cover at public gatherings, or mandatory first aid training within schools. Generally, five steps are associated with first aid:

Assess the surrounding areas.

Move to a safe surrounding (if not already; for example, road accidents are unsafe to be dealt with on roads).

Call for help: both professional medical help and people nearby who might help in first aid such as the compressions of cardiopulmonary resuscitation (CPR).

Perform suitable first aid depending on the injury suffered by the casualty.

Evaluate the casualty for any fatal signs of danger, or possibility of performing the first aid again.

Pediatric advanced life support

(manual defibrillators). If shockable, give a shock then resume CPR. If not shockable, continue CPR, give epinephrine, and consider an advanced airway. After

Pediatric advanced life support (PALS) is a course offered by the American Heart Association (AHA) for health care providers who take care of children and infants in the emergency room, critical care and intensive care units in the hospital, and out of hospital (emergency medical services (EMS)). The course teaches healthcare providers how to assess injured and sick children and recognize and treat respiratory distress/failure, shock, cardiac arrest, and arrhythmias.

Advanced cardiac life support

CPR performers, an airway/respiratory specialist, an IV access and medication administration specialist, a monitor/ defibrillator attendant, a pharmacist

Advanced cardiac life support, advanced cardiovascular life support (ACLS) refers to a set of clinical guidelines established by the American Heart Association (AHA) for the urgent and emergent treatment of life-threatening cardiovascular conditions that will cause or have caused cardiac arrest, using advanced medical procedures, medications, and techniques. ACLS expands on Basic Life Support (BLS) by adding recommendations on additional medication and advanced procedure use to the CPR guidelines that are fundamental and efficacious in BLS. ACLS is practiced by advanced medical providers including physicians, some nurses and paramedics; these providers are usually required to hold certifications in ACLS care.

While "ACLS" is almost always semantically interchangeable with the term "Advanced Life Support" (ALS), when used distinctly, ACLS tends to refer to the immediate cardiac care, while ALS tends to refer to more specialized resuscitation care such as ECMO and PCI. In the EMS community, "ALS" may refer to the advanced care provided by paramedics while "BLS" may refer to the fundamental care provided by EMTs and EMRs; without these terms referring to cardiovascular-specific care.

Underwire bra

"Shocking Defibrillator". b5media. Archived from the original on 2008-05-08. Retrieved 2009-05-22. the team will test whether a defibrillator can burn

An underwire bra (also under wire bra, under-wire bra, or underwired bra) is a brassiere that utilizes a thin, semi-circular strip of rigid material fitted inside the brassiere fabric to help lift, separate, shape, and support a woman's breasts. The wire may be made of metal, plastic, or resin. It is sewn into the bra fabric and under each cup, from the center gore to under the wearer's armpit. Many different brassiere designs incorporate an underwire, including shelf bras, demi bras, nursing bras, and bras built into other articles of clothing, such as tank tops, dresses and swimsuits.

The concept of an underwire can be traced to an 1893 patent that describes a breast supporting device using a rigid plate under the breasts for stability. The modern underwire bra was designed in the 1930s, and gained widespread popularity by the 1950s. As of 2005, underwire bras were the largest and fastest growing segment of the bra market. A bra without an underwire is a softcup bra.

Underwire bras are occasionally linked to health conditions including breast pain, mastitis, and metal allergies. Women wearing an underwire bra have in a few rare instances been subjected to extra scrutiny when their bra set off metal detectors at security checkpoints in airports or prisons. There have been a few recorded incidents where the underwire deflected a bullet or other weapon that struck the woman's chest.