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Cardioversion and defibrillation are two terms that are closely related to the heart. These are used when we talk about issues related to the heart, like irregular heartbeats or rhythms, which are also known as arrhythmias.The right knowledge of cardioversion and defibrillation can help save many people’s lives.Cardioversion uses synchronized, low-energy electrical shocks to treat abnormal heart rhythms.Defibrillation delivers unsynchronized, high-energy electrical shocks to address life-threatening arrhythmias.Both methods aim to restore normal heart function but differ in energy levels, timing, and target arrhythmias.The difference between Cardioversion and Defibrillation is that cardioversion is administered synchronised shocks during waves or QRS complexes of a cardiac arrest. In contrast, defibrillation is a random non-synchronised administration of shock waves during a cardiac cycle. The definition of these two might sound similar, but when we observe closely and understand that they are completely different.Cardioversion deals with the conversion of arrhythmia to sinus rhythm. There are a lot of related procedures to cardioversion, and everything coming under this category helps bring back sinus rhythm.Cardioversion’s most important aspect is that it needs to be synchronised, not just any random wave.Defibrillation is a random and non-synchronised administration of shocks that needs to be given during a cardiac cycle.Some indications of defibrillation are ventricular fibrillation, pulseless ventricular tachycardia, and cardiac arrest due to ventricular fibrillation. There are many more things by which the distinction between Cardioversion and Defibrillation can be seen clearly.Parameters of ComparisonCardioversionDefibrillationAboutIndications for Cardioversion include Atrial Fibrillation, Ventricular tachycardia with a pulse, and and Supravena tachycardia.It is a random non-synchronised administration of shock waves during a cardiac cycle.IndicationsIndications for Cardioversion include Atrial Fibrillation, Ventricular tachycardia with a pulse, and Supravena tachycardia.Indications for Defibrillation include Ventricular Fibrillation, Pulseless Ventricular Tachycardia, and cardiac arrest due to or resulting in VF.AnaesthesiaAnaesthesia is used in cardioversion almost all the time.It is advised to perform Defibrillation under sedation.EnergyEnergy joules are low.Energy Joules are high.Escalated EnergyEscalated for next shock (100J – 200J – 300J – 360J)No energy escalation for the next shock.Cardioversion is the procedure that emphasises synchronised administration of shock given during are waves of a cardiac arrest or the QRS complex of a cardiac arrest.It can be any procedure that helps convert arrhythmia, an irregular heart rhythm, back to a regular rhythm, that is, sinus rhythm.There are two types of cardioversions – chemical cardioversion and electrical cardioversion.Initially, the patient is treated with chemical cardioversion, and if it fails to provide any help, it is better to move on to electric cardioversion to safeguard the person.There are many scenarios in which cardioversion is required. Some of these are common, like chest pain, pulmonary oedema, syncope and hypertension.There are also many situations in which this technique of cardioversion is less frequently used, like atrial fibrillation. This is very important to restore the heart rhythm to the sinus rhythm.The risk of thromboembolic disease is associated with cardioversion of atrial fibrillation, so it is recommended to undergo anticoagulation at least four weeks after or three weeks before the procedure.Anaesthesia is given to the patient undergoing cardioversion almost all the time. Energy joules also escalated after every shock.Defibrillation is the random and non-synchronised administration of shocks during a cardiac cycle.It is not a very ancient procedure and was first introduced as alternating current Defibrillation to treat ventricular fibrillation in humans in 1956. After six years, in 1962, even direct current Defibrillation was discovered.Indications for defibrillation are ventricular fibrillation, pulseless ventricular tachycardia, and cardiac arrest due to or resulting in ventricular fibrillation.Defibrillation must be performed in conjunction with sedative agents. Defibrillators have the feature of delivering energy in different waveforms that are characterised as monophasic and biphasic.Monophasic defibrillation is known to deliver charge in just one direction. In contrast, biphasic defibrillation can deliver in one direction for the first half of the shock and then in the opposite electrical direction for the second half.Different portable relatives can be worn as a guest and monitor the heart 24/7.The market is full of varieties when you buy a defibrillator. They have advantages and disadvantages, so it is important to undergo quality research before choosing the right defibrillator.Some commonly available defibrillators are Philips Heartstart onsite, physio-control lifespan cr2, heart sign samaritan 350p, cardiac Science G3 AED fully automatic, and ZOLL AED plus fully automatic.Cardioversion is an administered synchronised shock given during QR complex or R waves of a cardiac arrest. In contrast, Defibrillation is a random and non-synchronised administration of shock waves during a cardiac cycle. Anaesthesia is used almost always in Cardioversion unless there is a special case, while defibrillation is an emergent manoeuvre, so sedation is only provided when utterly necessary.Atrial Fibrillation, Supervena Tachycardia, and Ventricular Tachycardia with a pulse are common indications of Cardioversion. Some common indications for Defibrillation include Ventricular tachycardia without a pulse, Cardiac arrest due to VF or resulting in VF.Energy Joules are low in cardioversion, whereas Energy Joules are high in Defibrillation.Energy is escalated for every next shock in cardioversion, while it is not escalated in the case of Defibrillation.References Al-Khatib SM, Stevenson WG, Ackerman MJ, et al. 2017 AHA/ACC/HRS guideline for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. Heart Rhythm. 2018;15(10):e190-e252. PMID: 29097320 pubmed.ncbi.nlm.nih.gov/29097320/.Curtis AB, Tomaselli GF. Approach to the patient with cardiac arrhythmias. In: Libby P, Bonow RO, Mann DL, Tomaselli GF, Bhatt DL, Solomon SD, eds. 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Also reviewed by David C. Dugdale, MD, Medical Director, Brenda Conaway, Editorial Director, and the A.D.A.M. Editorial team. Page 7Updated by: Denis Hadjiliadis, MD, MHS, Paul F. Harron, Jr. Professor of Medicine, Pulmonary, Allergy, and Critical Care, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA. Also reviewed by David C. Dugdale, MD, Medical Director, Brenda Conaway, Editorial Director, and the A.D.A.M. Editorial team. Page 8Doss AMA, Stokes JR. Viral infections and wheezing in preschool children. Immunol Allergy Clin North Am. 2022;42(4):727-741. PMID: 36265972 pubmed.ncbi.nlm.nih.gov/36265972/.Kliegman RM, St. Geme JW, Blum NJ, et al. Wheezing, bronchiolitis, and bronchitis. In: Kliegman RM, St. Geme JW, Blum NJ, et al, eds. Nelson Textbook of Pediatrics. 22nd ed. Philadelphia, PA: Elsevier; 2025:chap 439.Woodruff PG, Bhakta NR, Ortega VE, Lambrecht BN, Fahy JV. Asthma: pathogenesis and phenotypes. In: Broaddus VC, Ernst JD, King TE, et al, eds. 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Harron, Jr. Professor of Medicine, Pulmonary, Allergy, and Critical Care, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA. Also reviewed by David C. Dugdale, MD, Medical Director, Brenda Conaway, Editorial Director, and the A.D.A.M. Editorial team. Page 11Griffiths AG. Chronic or recurrent respiratory symptoms. In: Kliegman RM, St. Geme JW, Blum NJ, Shah SS, Tasker RC, Wilson KM, eds. Nelson Textbook of Pediatrics. 21st ed. Philadelphia, PA: Elsevier; 2020:chap 401.Rose E. Pediatric upper airway obstruction and infections. In: Walls RM, ed. Rosen's Emergency Medicine: Concepts and Clinical Practice. 10th ed. Philadelphia, PA: Elsevier; 2023:chap 162.Zalzal HG, Zalzal GH. Stridor in the Infant Patient. Pediatr Clin North Am. 2022;69(2):301-317. PMID: 35337541 pubmed.ncbi.nlm.nih.gov/35337541/.Page 12Felker GM, Teerlink JR. Diagnosis and management of acute heart failure. In: Libby P, Bonow RO, Mann DL, Tomaselli GF, Bhatt DL, Solomon SD, eds. 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Page 14Updated by: Jacob Berman, MD, MPH, Clinical Assistant Professor of Medicine, Division of General Internal Medicine, University of Washington School of Medicine, Seattle, WA. Also reviewed by David C. Dugdale, MD, Medical Director, Brenda Conaway, Editorial Director, and the A.D.A.M. Editorial team. Skip to main content I am very indebted to the specialist who saw me and staff at Royal Brompton Hospital. As a bronchiectasis outpatient, I've been coming to RBH for the last three years. Salues to RBH. Patient at Royal Brompton Hospital The charity supports Royal Brompton and Harefield hospitals by contributing to major building projects, buying equipment, funding vital research and improving the lives of patients with heart and lung conditions. Donate now Guy’s and St Thomas Specialist Care delivers private heart, lung and sleep services for Royal Brompton and Harefield hospitals. 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Entry Term(s) Cardiac Electroversion Cardioversion Defibrillation, Electric Electrical Cardioversion Electroversion Therapy Electroversion, Cardiac Therapy, Electroversion NLM Classification # WG 166.5.E5 See Also Defibrillators Public MeSH Note65 History Note65(63) Date Established 1965/01/01 Date of Entry 1999/01/01 Revision Date 2016/05/31 Should you be an individual who knows anyone who has an issue with their heart, such as irregular heart rhythms or arrhythmias, you may be interested in knowing the differences between cardioversion and defibrillation. The procedures differ in what they are used for, and in the way they treat the patient. It is important that you are aware of the differences and how to act in an emergency situation. Being aware of this knowledge means that you can better assist anyone who may be in need of treatment for any heart rhythm-related issue. This article details all the necessary information that you could need, giving you a full breakdown of the differences between cardioversion and defibrillation. What is Pulseless Ventricular Tachycardia? Pulseless ventricular tachycardia is a life-threatening cardiac arrhythmia in which synchronized ventricular contractions are replaced by very fast but inadequate contractions, causing organ perfusion problems and heart failure. Ventricular tachycardia without a pulse is a medical emergency. Cardioversion and Defibrillator Differences There are a number of differences between defibrillation and cardioversion. They are used to treat different types of issues, making it crucial that you know which technique to employ when a patient has an emergency in your vicinity. Using the wrong technique could have some extremely dire effects on the chest of the patient, and can even cause the heart to go into cardiac arrest. A defibrillation is a form of treatment that is used for patients who are facing life-threatening arrhythmias where the patient in question does not have a pulse. Forms of defibrillation include both ventricular fibrillation and pulseless ventricular tachycardia. On the other hand, cardioversion relates to any procedure with the aim of converting an arrhythmia back to a sinus rhythm. When a patient has an unstable heart rhythm or has already tried chemical cardioversion, then electrical cardioversion is used in order to ensure their safety. Scenarios in which cardioversion is used are generally associated with pulmonary edema, hypotension, chest pain, or syncope. The technique is used less frequently in situations such as atrial fibrillation in order to revert the heart rhythm back to a sinus rhythm. Both of these treatment processes aim to deliver electrical energy to the heart in order to stun it momentarily. This allows for a normal sinus rhythm to kick in due to the heart’s regular pacemaker known as the sinoatrial node. Defibrillators, Cardioversion and Pacemaker Defibrillators and cardioversion are therapeutic interventions designed to address abnormal heart rhythms, while a pacemaker is an implanted device that regulates these rhythms. A defibrillator, often found in Automated External Defibrillators (AEDs), delivers unsynchronized electric shocks to the heart to treat life-threatening arrhythmias like ventricular fibrillation. Synchronized cardioversion, a subset of defibrillation, delivers shocks that are timed or “synchronized” with the heart’s electrical activity to treat other specific arrhythmias like atrial fibrillation or atrial flutter. On the other hand, a pacemaker continuously monitors the heart and, when it detects an irregular or slow rhythm, sends electrical impulses to prompt the heart to beat at a normal rate. In some advanced devices, a pacemaker can be combined with a defibrillator, termed an Implantable Cardioverter Defibrillator (ICD). An ICD both regulates the heart’s rhythm and can deliver shocks if a life-threatening arrhythmia is detected. However, standard defibrillators or cardioversion procedures do not “use” a pacemaker, but they can exist in combination with specialized devices. Longevity with Pacemaker How long can you live with a pacemaker? The longevity of an individual with a pacemaker varies depending on several factors, including the reason for the pacemaker, the individual’s overall health, and how well they follow medical advice and attend regular check-ups. A pacemaker itself, as a device, typically has a battery life ranging from 6 to 15 years, depending on its type and usage. When the battery nears its end, the pacemaker will need to be replaced in a relatively straightforward procedure. Regarding the lifespan of the individual, many people live full, active lives with pacemakers. In many cases, the pacemaker can rectify the heart rhythm abnormality, leading to symptom improvement and an enhanced quality of life. It’s crucial to understand that the pacemaker is addressing the electrical issues of the heart and not other aspects like the heart’s pumping function or any underlying heart diseases. Regular follow-ups with a cardiologist, adherence to medications, and addressing other associated health conditions will play significant roles in determining an individual’s lifespan and quality of life with a pacemaker. Defibrillation Prévost and Batelli, two physiologists, conducted shock tests on the hearts of dogs at the end of the 18th century. They used electrical shocks on the dogs and found that small shocks placed their hearts in VF, which could be reversed with a larger shock. It was first used on a 14-year-old boy who was undergoing cardiothoracic surgery for congenital heart failure by Claude Beck, a cardiothoracic surgeon. The open heart was covered with electrodes. In Russia, closed-chest defibrillation was not adopted until the 1950s. Bernard Lown, however, did not design the modern monophasic defibrillator until 1959. This is based on capacitors being charged and then paddles producing a shock over a few milliseconds. The biphasic waveform was discovered in the 1980s. This resulted in a shock that was just as powerful as monophasic shocks at lower energy levels. Differences Between Monophasic and Biphasic Systems The current in monophasic systems only flows in one direction, from one paddle to the next. The current in biphasic systems moves towards the positive paddle, then reverses and returns several times. Biphasic shocks are associated with fewer burns and less myocardial damage since they produce one cycle every 10 milliseconds. The rate of first shock performance in cardiac arrests due to a shockable rhythm is only 60% with monophasic shocks, but it rises to 90% with biphasic shocks. However, biphasic defibrillators’ effectiveness over monophasic defibrillators has not been reliably reported. Types of Defibrillators Automated External Defibrillators (AEDs) are the most commonly known types of defibrillators but you might wonder why is an AED needed. They are often the first choice of an organization due to them being extremely useful, as well as the fact that they do not require any special medical training to properly utilize. These types of defibrillators are often found in public venues such as offices, shopping centers, airports, and other similar public buildings. The work by analyzing the heart rhythm of the patient, and then charging and delivering an appropriate shock to their heart in order to correct the rhythm. Unfortunately, these devices cannot be overwritten, and in some cases, can take between 10 and 20 seconds to identify arrhythmias. However, the ease of use, as well as the speed of these devices, makes them a popular choice for many. Semi-automated automated external defibrillators are another variation of an AED that is not as popular as regular AEDs; however, these are primarily utilized by used by paramedics due to their ability to pace. They are generally very similar to regular AEDs but they can be overridden when needed, and tend not to have an ECG display. Other types of defibrillators include standard defibrillators with a monitor, which can be monophasic or biphasic, as well as transvenous or implanted defibrillators. Risks Associated with Defibrillation It’s extremely unlikely for a well-maintained, stable defibrillator to malfunction. The unit assesses and measures the victim’s heart rhythm. The device then provides you with a number of instructions that you should follow in order to save the life of the individual in trouble. By following the instructions provided to you, you ensure that you are not doing anything wrong, even if you have no prior medical training. It’s more likely that you’ll sustain an injury while practicing CPR, as broken ribs are common, particularly among the elderly. You risk aggravating their injuries by pushing them into the protected airway location. These potential problems are the lesser of two evils as compared to what can happen if you don’t obey the chain of survival for treating a sudden cardiac arrest. Energy Levels for Defibrillators Different types of defibrillation use different levels of power in order to achieve the results that they are after. Monophasic defibrillators generally adhere to the cardiopulmonary resuscitation (CPR) algorithm that suggests a single shock that is started and repeated at 360 Joules. When it comes to biphasic defibrillators, the CPR algorithm suggests initial shocks that are between 150 and 200 Joules, followed by subsequent shocks that range between 150 and 360 Joules. Cardioversion Cardioversion is used for decompensated rapid atrial fibrillation that is associated with a rapid ventricular response. Examples of this include hypotensive patients who do not respond to any medical therapy. It is also used to treat ventricular fibrillation with a pulse, as well as supraventricular tachycardia that includes atrial fibrillation without decompensation. The shock in cardioversion must be timed correctly so that it does not occur during the vulnerable cycle, an example of this is the T wave. Atrial Fibrillation Cardioversion is a rhythm regulation technique. Cardioversion is not always effective, with 50% of patients redeveloping atrial fibrillation after a year. Cardioversion and medical therapies have equal efficacy (unless permanent atrial fibrillation). Since cardioversion of atrial fibrillation is linked to an increased risk of thromboembolic disease (TED), anticoagulation is recommended for at least three weeks prior to and four weeks after the procedure. While some centers use a transesophageal echocardiogram to look for thrombus during the operation, a few patients still develop TED despite negative results. When cardioverting, a more recent paper suggests using a transoesophageal echocardiogram. In patients who have had a past failure to cardiovert or an early recurrence of atrial fibrillation, sotalol or amiodarone should be provided for at least four weeks prior to cardioversion. Others recommend using drugs like sotalol and amiodarone to keep the sinus rhythm after cardioversion. Defibrillator Settings For Cardioversion When one asks “What is Synchronized Cardioversion,” they are inquiring about a specific medical procedure designed to restore normal heart rhythms in patients with certain types of arrhythmias. Synchronized Cardioversion involves delivering a timed electric shock to the heart, synchronized with the cardiac cycle, particularly targeting the R-wave’s peak. This precise timing distinguishes it from standard defibrillation, ensuring the shock does not inadvertently induce a more dangerous rhythm like ventricular fibrillation. The procedure is often employed when patients suffer from rhythms like atrial fibrillation or atrial flutter, especially when medications fail to bring about the desired effect or the arrhythmia is acutely life-threatening. Start synchronized cardioversion with a biphasic defibrillator at 120 Joules (J) in patients with AF causing hemodynamic compromise, and raise to 200 J during subsequent shocks. Unstable atrial flutter or paroxysmal supraventricular tachycardia (PSVT) requires much less energy, so cardioversion can be started at 50 J biphasic (100 J monophasic) at first, then increased to 100 J if it fails. If the shock fails to stop the SVT, a 200 J (360 J monophasic) follow-up shock can be provided. Monomorphic VT with a pulse is handled with synchronized cardioversion, which starts with a 100 J biphasic (100 J monophasic) shock and gradually increases the energy to 200 J biphasic (360 J monophasic) shocks before sinus rhythm is achieved. An initial defibrillation shock of 120 J (200 J monophasic) is normally enough to stop ventricular fibrillation (VF) or pulseless ventricular tachycardia (VT). If the first shock fails, the energy can be increased to 200 J (360 J monophasic) for the next shock. Defibrillation with similar energy settings (120 to 200J biphasic) is used in the case of polymorphic VT with a pulse as it is in the case of pulseless VT. Indications For Defibrillation You may be wondering what the indications for defibrillation are. Knowing the indicators can make it much easier for you to identify when a patient is in need of defibrillation in order to save their life. By you being aware of these indicators, you can buy yourself some valuable time in diagnosing when an individual requires an energy shock to reset the electrical activity of the heart, and allow it to resume a regular rhythm. There are three primary indicators for defibrillation, and these are: Pulseless ventricular tachycardia Ventricular fibrillation Cardiac arrest as a result of or causing ventricular fibrillation Is Unsynchronized Cardioversion the Same as Defibrillation? Synchronized cardioversion is a low energy shock that uses a sensor to transmit electricity at the same time as the QRS complex’s peak (the highest point of the R-wave). When a defibrillator’s “sync” option is selected and the shock button is pressed, the shock may be delayed. The computer reads and synchronizes with the patient’s ECG rhythm during this time delay. This is achieved so that the shock can be administered at or near the height of the R-wave in the QRS complex of the patient. During cardiac repolarization, synchronization prevents the transmission of a low energy shock (t-wave). If the shock happens on the t-wave (during repolarization), there is a fair risk that it can cause VF (Ventricular Fibrillation). Unstable atrial fibrillation, atrial flutter, atrial tachycardia, and supraventricular tachycardias are the most common signs of coordinated cardioversion. If drugs fail to control the arrhythmias in a stable patient, coordinated cardioversion would almost certainly be needed. Unsynchronized cardioversion (defibrillation) is a high-energy shock delivered as soon as the defibrillator’s shock button is pressed. This means that the shock can occur at any time during the cardiac cycle (QRS complex). If there is no coordinated intrinsic electrical activity in the heart (pulseless VT/VF) or the defibrillator fails to synchronize in an impaired patient, unsynchronized cardioversion (defibrillation) is used. If the patient is stable and a QRS-t complex can be seen, use (low energy) synchronized cardioversion in cases where electrical shock is needed. It is therefore safe to say that unsynchronized cardioversion and defibrillation are the same things. The term unsynchronized cardioversion is just a more accurate term used to describe the process of what defibrillation really is. When Should You Do Synchronized Cardioversion? A pulse that is too rapid (tachycardia) or erratic may be corrected with cardioversion (fibrillation). Cardioversion is often used to treat patients with atrial fibrillation or flutter. When the electrical signals that usually cause your heart to beat at a regular pace do not propagate correctly through the upper chambers of your heart, these conditions occur. Cardioversion is typically performed in advance, but it can also be done in an emergency. Electric shocks transmitted by electrodes connected to your chest when you’re sedated are typically used for cardioversion. Your doctor can see right away whether the operation has restored a natural heartbeat with electric cardioversion. Electric cardioversion takes less time than medication-only cardioversion. You may not receive electric shocks to the heart if your doctor suggests cardioversion and drugs to restore the heart’s rhythm. Cardioversion is not to be confused with defibrillation, which is an emergency treatment used when the heart slows or quivers ineffectively. Defibrillation shocks the heart with more intense shocks to adjust its rhythm. Risk Associated with Cardioversion Although experiencing any complications when it comes to cardioversion is very rare, there are still some present. You should be aware that your doctor should take all the necessary precautions in order to reduce the chance of any of these risks occurring; however, these are some of the complications that could occur: Blood clots that have been dislodged. Blood clots can form in the hearts of people who have irregular heartbeats. These blood clots may travel to other parts of your body as a result of electric cardioversion. This can result in potentially fatal complications, such as a stroke or a blood clot that travels to your lungs. Until cardioversion, your doctor can prescribe blood-thinning medications or check for blood clots in your core. A heart rhythm that is irregular. Some people who have cardioversion develop other heart rhythm issues during or after the operation, although this is uncommon. This is a relatively uncommon complication. If this occurs, it normally occurs within minutes of your operation. Should this happen, your doctor can prescribe you medication or administer additional shocks in order to sort the issue out. Burns to the Skin. In very rare circumstances, individuals may notice that they have received some very minor burns on their skin where the electrodes were previously placed. Cardioversion procedures can be administered during pregnancy; however, it is recommended that the heartbeat of the baby is monitored throughout the entire process in order to ensure that they do not have any negative reactions to the procedure being done. How to Prepare for Cardioversion? Cardioversion procedures are usually planned ahead of time. If your symptoms are serious, you can need cardioversion in a hospital emergency room. Before your operation, you won’t be able to eat or drink anything for about eight hours. Before your procedure, your doctor can tell you whether or not you should take any of your regular medications. If you must take drugs prior to your operation, just drink enough water to allow you to swallow your pills. A transesophageal echocardiogram can be performed prior to cardioversion to check for blood clots in your heart. Cardioversion can cause blood clots to break free, posing a life-threatening risk. Until cardioversion, your doctor assesses if you need a transesophageal echocardiogram. If blood clots are discovered, the cardioversion operation can be postponed for three to four weeks. To minimize the risk of complications, you’ll take blood-thinning drugs during that period. What to Expect During the Procedure? You should be given drugs via an IV to put you to sleep during the operation so that the shocks won’t harm you. Other drugs can be administered through IV to aid in the restoration of your heart rhythm. On your chest, a nurse or technician positions numerous large patches known as electrodes. Wires attach the electrodes to a cardioversion system (defibrillator). The machine tracks your pulse and sends shocks to your heart to bring it back to normal. If your heart beats too slowly after cardioversion, this machine can fix it. After you have been sedated, the process of electric cardioversion usually only takes a few minutes to complete. What to Expect After the Procedure? Electric cardioversion is performed as an outpatient procedure, which means you can go home the same day. You should spend an hour or two in a recovery bed, where problems can be closely monitored. You could most probably need someone to bring you home, and your decision-making abilities may be impaired for several hours after your treatment. Even if no clots were detected in your heart prior to your operation, you need to take blood thinners for at least a few weeks afterward to prevent new clots from forming. The Results of Electrical Cardioversion? Cardioversion can easily restore a normal heartbeat in most people. It’s likely that additional procedures would be needed to maintain a regular heart rhythm. Your doctor may advise you to make lifestyle changes to improve your heart health and prevent or treat arrhythmias-causing conditions like high blood pressure. Choosing the Right Defibrillator for Your Needs Your defibrillator may have been gathering dust for a while, but it must be ready to support you in an emergency. Depending on where it is placed, it may be exposed to extremely difficult conditions. If it’s aboard a ship, it’ll have to be able to endure the most severe conditions. The most critical move is to find out which manufacturer makes the AED that better suits your or your organization’s needs. If you want the rescue to go smoothly, you may need to select the right defibrillator to deliver the shock. If you know you’ll be operating in a noisy atmosphere where you won’t be able to hear audio prompts clearly, an AED with visual prompts may be a better option to avoid any issues during the operation. There are a variety of choices available to you, each with its own set of advantages and disadvantages. Some of these options include: The Bottom Line By being aware of the differences between cardioversion and defibrillation, you can ensure that the proper treatment is performed for the resuscitation of any individual who may be in need of assistance. Knowing how to assist a patient based on the symptoms that they are displaying gives you the best chance of properly assisting them in recovering from arrhythmia or other chest-related issues. By ensuring that you are able to administer the appropriate medical treatment to an individual, the chances of them experiencing any negative side effects are greatly reduced. The patient’s life is the most important thing at the end of the day, and it is imperative that everything is done to give them the best chance of survival. Should you be an individual who knows anyone who has an issue with their heart, such as irregular heart rhythms or arrhythmias, you may be interested in knowing the differences between cardioversion and defibrillation. The procedures differ in what they are used for, and in the way they treat the patient. It is important that you are aware of the differences and how to act in an emergency situation. Being aware of this knowledge means that you can better assist anyone who may be in need of treatment for any heart rhythm-related issue. This article details all the necessary information that you could need, giving you a full breakdown of the differences between cardioversion and defibrillation. Pulseless ventricular tachycardia is a life-threatening cardiac arrhythmia in which synchronized ventricular contractions are replaced by very fast but inadequate contractions, causing organ perfusion problems and heart failure. Ventricular tachycardia without a pulse is a medical emergency. There are a number of differences between defibrillation and cardioversion. They are used to treat different types of issues, making it crucial that you know which technique to employ when a patient has an emergency in your vicinity. Using the wrong technique could have some extremely dire effects on the chest of the patient, and can even cause the heart to go into cardiac arrest. A defibrillation is a form of treatment that is used for patients who are facing life-threatening arrhythmias where the patient in question does not have a pulse. Forms of defibrillation include both ventricular fibrillation and pulseless ventricular tachycardia. On the other hand, cardioversion relates to any procedure with the aim of converting an arrhythmia back to a sinus rhythm. When a patient has an unstable heart rhythm or has already tried chemical cardioversion, then electrical cardioversion is used in order to ensure their safety. Scenarios in which cardioversion is used are generally associated with pulmonary edema, hypotension, chest pain, or syncope. The technique is used less frequently in situations such as atrial fibrillation in order to revert the heart rhythm back to a sinus rhythm. Both of these treatment processes aim to deliver electrical energy to the heart in order to stun it momentarily. This allows for a normal sinus rhythm to kick in due to the heart’s regular pacemaker known as the sinoatrial node. However, for certain types of cardiac arrhythmias, the most effective treatment is synchronized cardioversion. So it’s important to know the difference between cardioversion and defibrillation, when they’re used, and when one or the other may be dangerous and even cause cardiac arrest. Synchronized Cardioversion Vs. Defibrillation: Overview The goal of both defibrillation and cardioversion is to transfer electrical energy to the heart. This stuns the heart instantly in hopes of generating a normal sinus rhythm from the heart’s natural pacemaker, which the heart can then maintain on its own. While both use the same general action and can use the same equipment, the method is different, as well as when you use them, how you use them, and why you’re shocking the heart. Primarily, you use defibrillation during an immediate life-threatening situation. You have a cardiac arrest, and if you don’t get this heart restarted, the victim will officially transition. Conversely, doctors use cardioversion to convert heart rhythm when a patient has an unstable heart but is not immediately in danger of dying. Cardioversion stabilizes the heart rhythm. It is, therefore, usually an elective procedure. With guidance from their doctor, a patient chooses cardioversion to correct their heart rhythm. But it can also be urgent if the patient is experiencing tachycardia or a feeling of breathlessness. Second, doctors synchronize cardioversion to achieve a specific rhythm outcome. You don’t time defibrillation. You just need a shockable rhythm. So, as soon as there is a shockable rhythm, an automatic defibrillator tells you to “hands off” or “clear”. Then a shock occurs. But during cardioversion, the machine waits a couple of seconds to sync up with the rhythm to shock at a precise time in that rhythm. Third, a defibrillator delivers a higher energy dose vs. cardioversion. Ultimately, cardioversion performed when needed could prevent a subsequent cardiac arrest later that day, week, or year. That’s because it transforms an irregular rhythm into a stable one. But once a cardiac arrest occurs, defibrillation is your only option–that is, if you have a shockable rhythm. Below you’ll find further information about these procedures to further distinguish between them. Cardioversion vs Defibrillation: A Chart for Easy Comparison Use the following chart to help you see the differences between cardioversion and defibrillation. Then, read on about the process of providing care. Category Defibrillation Cardioversion Patient Condition The patient is in cardiac arrest or has no heartbeat The patient is functional but has an irregular heartbeat Energy Levels Between 150 and 360 joules Between 50 and 300 joules Synchronization Is done as necessary Set to a specific point according to an EKG Sedation Requirement Midazolam or Diazepam Midazolam or Diazepam Typical Arrhythmias Treated Life-threatening arrhythmia Used to convert an arrhythmia back to sinus rhythm, such as with atrial fibrillation What Is Defibrillation? Defibrillation is a shock-based treatment for life-threatening arrhythmias when a patient does not have a pulse. These could include ventricular fibrillation (VF) or pulseless ventricular tachycardia (VT). It’s done when someone is in cardiac arrest. Someone can perform it in a hospital, an ambulance, or an out-of-hospital setting. While medical professionals perform defibrillation in the hospital, the average person with CPR training can also perform defibrillation if they have access to an automatic external defibrillator (AED). You can buy one for your home or office. A Brief History of the Defibrillator Two physiologists (Prévost and Batelli) discovered the power of fibrillation around the end of the 18th Century by running dog experiments using shock. They found that when they applied small shocks to the dog’s heart, they could put the heart into V-fib and then shock it again with a larger shock to reverse the change. But it would be another 14 years before a cardiothoracic surgeon did defibrillation on a 14-year-old boy on whom he was performing cardiothoracic surgery for a congenital heart disorder. He placed electrodes on the open heart for the procedure. The technology remained mostly unchanged for another 150+ years until the 1950s, when Russian researchers developed a defibrillator that they could use on a closed chest. This would later become the modern-day monophasic defibrillator. In the 1980s, researchers discovered a biphasic waveform, which would replace monophasic shocks in some instances. Defibrillation and Cardioversion share this history since they both use a defibrillator to work. Monophasic Vs. Biphasic Shock A monophasic shock only travels in one direction from one paddle to another, while a biphasic shock travels from one paddle to the other and then back several times. Biphasic shock results in fewer burns and has a higher first shock success rate (90% to 60%), although studies comparing how use may impact discharge success haven’t been thoroughly studied. Types of Defibrillators There are four primary types of defibrillators, which are used in different settings: Automated External Defibrillators (AEDs) are often found in CPR kits for the average person with CPR training. Semi-automated AEDs can be overridden and are therefore only used by a trained professional like a paramedic. Standard defibrillators with monitors require professional skills to operate. You’ll find them in hospitals mostly. Implanted defibrillators can shock the heart back into a rhythm during a cardiac arrest without assistance from a bystander. While paddles were once very common, they’ve now been overtaken by the use of adhesive patches, which are generally easier to use and perform better because they adhere to the chest without the need for gel application. Risks of Defibrillation Defibrillation risks are minimal when the machine is well-maintained. Defibrillators measure the patient’s heart rhythm and, if you have an automatic machine, they provide clear instructions based upon that rhythm. All you have to do is follow his instructions even if you have no medical training. Fragile patients, like the elderly, may experience broken ribs or the aggravation of an existing injury. But defibrillation saves a life, so those are generally considered reasonable casualties of the procedure. Shocking yourself is also possible, so when the machine says “hands off”, please make sure no one’s touching the victim. Defibrillator burns have been reported but are rare with current equipment and a sign of a poorly-maintained machine that probably needs to be replaced. The batteries and pads of an automatic defibrillator typically last two to five years, depending on the frequency of use. So they need to be replaced to maintain proper function. An implanted defibrillator lasts up to 10 years, according to Johns Hopkins at HopkinsMedicine.org. These same risks will apply to cardioversion plus a few more. Energy Levels for Defibrillation Monophasic – CPR algorithm recommends single shocks started at and repeated at 360 Joules (J). Biphasic – CPR algorithm recommends shocks initially of 150-200 J. Then use subsequent shocks incrementally 150, 200, 300, 360 J. A clinical trial on biphasic defibrillation showed that increasing the energy level of shocks was more likely to result in a conversion and stop ventricular fibrillation (VF) when compared with repeated shocks at 150 J. Often, the first shock did nothing, but the subsequent higher J shock did. What Is Cardioversion? Synchronized cardioversion is a process to achieve a sinus rhythm in a patient who has arrhythmia. It requires the delivery of a low energy shock at a specific time. Doctors achieve this timing by viewing a defibrillator monitor or using a machine that syncs to the rhythm automatically. In both cases, you’ll only find this equipment in a hospital or specialized clinic. They sync the shock to a specific point in the QRS complex (the main spike visible on that monitor with EKG / ECG). Through this method, atrial fibrillation can be converted to a normal sinus rhythm while preventing the prompting of ventricular fibrillation (VF). This happens because you’ve synchronized the electrical shock to the R wave. At the same time, you avoided that susceptible T-wave and averted ventricular fibrillation. Uses & Indications Patients who need cardioversion experience the following symptoms: Breathing struggles from pulmonary edema (fluid in the lungs) Hypotension (low blood pressure) Chest pain Syncope (loss of consciousness from low blood pressure) When a patient has symptoms like these, their doctor will need to run tests to confirm the cause of the symptoms. Electrical cardioversion may be indicated if those tests show: Unstable pulse Failed chemical cardioversion with chest pain or unlikelihood chemical cardioversion would be successful. Decompensated rapid AF with rapid ventricular response. An example of this would be a hypotensive patient who isn’t responding to other medical therapies. Ventricular tachycardias (VT) with pulse Supraventricular tachycardias, which includes AF without decompensation but only if not in an acutely urgent situation. The technique is used less frequently in situations such as atrial fibrillation to revert the heart rhythm to a sinus rhythm. In a patient with atrial fibrillation, you use cardioversion to control the rhythm. However, cardioversion will not always be successful. Studies have shown as many as 50% of patients’ hearts will return atrial fibrillation within 12 months. However, a doctor could do another cardioversion at that time, if needed. Risks of Cardioversion In addition to the general risks of defibrillation, you should stay aware of these potential complications. Having cardioversion may put patients at increased risk of thromboembolic disease (TED) soon after the procedure. As a precaution, doctors prescribe anti-coagulation at least three weeks before and four weeks after the procedure. Doctors may also use a transesophageal echocardiogram during the procedure to spot thrombus, although some patients may still develop TED. How to Cardiovert Cardioversion is performed in a hospital with a doctor, an anesthesiologist, and cardiac nursing professionals present. The anesthesiologist will plan and supervise sedation of the patient using general anesthesia. Once sedated, the team performs the following steps: Attach the self-adhering electrodes Pick an energy level to start. Note: a higher starting energy may require fewer shocks. Levels are based on the starting type of rhythm. For Broad complex tachycardia and AF, you’d do monophasic starting at 200 or biphasic at 120-150 J. For atrial flutter and narrow complex tachycardia, the recommendation is starting at 100 for monophasic and 70-120 J for biphasic Achieve a visible trace on the monitor Hit the sync button. You’ll see a blip or dot marking the QRS complex. This will allow the shock to sync automatically so it shocks with correct timing that might not be achieved manually. Note: sync may not work in tachycardia where the QRS complex is variable. Charge Call “Clear” and look to see that the bed is clear. Shock. Expect a 1-2 second delay since the machine is synchronizing the shock. View the rhythm to see if you have a sinus rhythm. If yes, stop. If not, adjust the energy level up incrementally and repeat steps 5-8. Look for burns that may need treatment Get a 12-lead ECG for a more thorough reading Special Considerations on Infants and Children Pediatric Cardioversion and Defibrillation require attention to detail and some basic math skills. The recommendation is to start at 1J for every kilogram of weight. You should never use an automatic or semi-automatic defibrillator on a child younger than one year. Only use a manual one with a monitor, which usually means the child is in the hospital. Whether performing on an infant or child, note that manual defibrillators only go as low as 4J/Kg, so use specialized pediatric pads for both manual and automatic external defibrillators. This reduces the energy delivered when used in combination with the pediatric setting. You can view further details related to pediatric treatment in Pediatric Cardiac Arrest Algorithm. Children eight and older can receive cardioversion and defibrillation at adult levels, according to the guidelines outlined in your Advanced Cardiac Life Support Training. You can now obtain this training 100% online. Pediatric defibrillation is complex in that the recommended shock level is much lower, beginning with a dose of 2 J/kg and use of 4 J/kg for subsequent attempts. Because ventricular fibrillation occurs in 8 to 20% of pediatric cardiac arrests, it is critical to consider the best treatment possible when administering this shock. Data indicates that, with every 1 minute of delay in defibrillation, the survival rate of the child falls by 7 to 10%. Cardioversion Vs. Defibrillation Cardioversion and defibrillation both rely on the power of shock to achieve the desired heart rhythm. But when they’re needed and how doctors use the defibrillation equipment are very different. Exploring the differences between procedures with so many similarities can help you better understand how the heart works and how doctors can apply different strategies to help the heart perform at its best. Chemical vs Electrical Cardioversion In the comparison of cardioversion vs defibrillation, consider the mechanisms used. Studies indicate that chemical vs electrical cardioversion can be a critical factor for doctors and rescuers to consider, and no single consensus exists on which method is the preferred option. In short, a chemical cardioversion occurs when an abnormal heartbeat is cardioverted to a normal rhythm using medications. These medications work to get the heart back into normal rhythm. By comparison, electrical cardioversions use electrical shock to adjust the rhythm of the heart. Both methods may be effective, and electrical cardioversion may be faster at converting a person. For those who cannot be shocked, the use of medication may be necessary. Note that in cardioversion vs defibrillation, only cardioversion allows for a true chemical treatment. Defibrillation only occurs with the application of electrical energy, though both methods may be used during this process. Synchronized Cardioversion vs Defibrillation You may hear a significant amount about synchronized cardioversion vs defibrillation or defibrillation vs synchronized cardioversion. Let’s break down some of the core elements of this comparison of cardioversion vs defibrillation: Synchronized cardioversion: This process occurs in a specific part of the heart’s beat cycle. More precisely, the first step is to recognize the electrical impulses that control the heartbeat and then measure them accurately. This allows for a jolt to be administered at a very specific time within the heart’s beating cycle, which could improve cardioversion outcomes. These cardioversions are timed. Unsynchronized cardioversion: These cardioversions require the use of more energy because they are untimed and, therefore, can deliver a shock at any time during the cardiac cycle. This type of cardioversion is much more in line with a defibrillator. In many cases, an unsynchronized cardioversion is the same application and treatment process as a defibrillation. It occurs at any time after the machine charges and is ready to fire,

even without any monitoring of the heart’s beat. How to Cardiovert in the Field Cardioversions happen in a hospital setting. However, if there is an AED available, rescuers can use it with proper education. Rescuers can learn how to cardiovert using an AED after taking a licensing exam. From the objective of the patient, the process will include: Being under twilight sedation A cardioverter machine will deliver a quick jolt of energy to the patient. This energy, delivered to the heart through the placement of cardioversion pads, changes the beat. It interrupts the abnormal beat or electrical rhythm of the heart and then restores normal heart rhythm, which is more natural and what the heart wants to beat. In some situations, it may take several shocks to restore the normal function of the heart. The procedure only takes a few minutes. If you are a rescuer and wish to learn how to administer a cardioversion or defibrillation in an emergency, complete the CPR, AED & First Aid Certification Course we offer. What is atrial fibrillation? Atrial fibrillation is often a component of cardioversion vs defibrillation conversations. It indicates the heart’s quivering action or irregular heartbeat in the atrium or the upper chamber of the heart. Often called Afib, this condition is not usually life-threatening, though it can prolong complications to the heart and lead to complications over time. Which is better, unsynchronized cardioversion vs defibrillation? An unsynchronized cardioversion is the same as defibrillation. These types of cardioversion do not have a timed or planned moment of transferring the energy to the other patient. Rather, as soon as the device is charged up, it is applied without paying attention to the actual cardiac cycle. What are synchronized cardioversion joules? Synchronized electrical cardioversions typically utilize a recommended energy level of 50 to 300 joules, depending on the person’s age and overall condition. A narrow regular level indicates joules of 50 to 100 joules. If a wide regular heartbeat occurs, 100 joules are used. With a narrow irregular rate, 120 to 200 joules are used. What is the difference between synchronized and unsynchronized cardioversion? Synchronization indicates that the jolt of energy is applied at a very specific point in the cardiac cycle or the process of each heartbeat. This can help to change the heart rate back to normal rhythm without the use of as much electrical shock as what occurs in untyrannized cardioversions. Ready to Learn More? Enroll in the ACLS certification course now. Doing so allows you to learn more about cardioversion vs defibrillation and teaches you how to take action during an emergency medical event. Cardioversion is a procedure that returns an abnormal heart rhythm to normal. It's used when you have an arrhythmia, which means your heart is beating too fast or irregularly. Cardioversion can be life-saving, because irregular heartbeats can lead to heart attacks or strokes. It also helps prevent problems in the future.Cardioversion is a common treatment for atrial fibrillation (AFib). AFib is a condition when the upper chambers of the heart, called atria, beat in an abnormal way. This puts the upper chamber out of sync with the heart's lower chambers, called ventricles. Atrial fibrillation can increase the risk of having a stroke.If you have AFib, you could feel very tired, dizzy, or short of breath. AFib can also give you heart palpitations. Some people have no symptoms.Doctors are more likely to use cardioversion for AFib when it's your first time having AFib. If you have AFib on a regular basis, and it is also causing you to have symptoms, then your doctor might want you to have cardioversion. Some patients may not be good candidates for cardioversion. Your doctor may not recommend cardioversion if you have only minor symptoms from AFib. If you are elderly, have other serious medical conditions, or you've had AFib for a long time, then your doctor may not want you to have cardioversion. There are two types of cardioversion:Chemical cardioversionYour doctor may use medication to try to get your heart back to normal. This is called chemical or pharmacologic cardioversion. You typically get the medicine through an IV while doctors check your heart. But sometimes, people can take it as a pill.Your doctor will decide the best medicine to use, depending on what type of abnormal rhythm you have. If you have other medical conditions, that could affect what type of cardioversion your doctor wants you to have. Different medicines are used for cardioversion, including: Amiodarone (Cordarone)Dofetilide (Tikosyn)Flecainide (Tambocor)Ibutilide (Corvert)Propafenone (Rhythmol)Electrical cardioversion Drugs alone may not correct your heartbeat. Electrical cardioversion gives shocks through electrode pads or paddles to regulate your heartbeat. First, you'll get medicine to make you fall asleep. Then, your doctor will put the pads or paddles on your chest, and sometimes your back. These will give you a mild electrical shock to get your heart's rhythm back to normal. You may only need one, or your doctor may use several shocks. Because you’re asleep, you probably won’t remember being shocked. You can usually go home the same day.Your skin may be irritated where the patches or paddles touched it. Your doctor can suggest a lotion to ease pain or itching.Cardioversion and defibrillation are not the same. Both procedures use shocks to make the heart's rhythm return to normal. Defibrillation uses stronger shocks than cardioversion. It may be used in lifesaving situations to correct severe problems with heart rhythms. The procedures deliver shocks at different stages of the cardiac cycle. The cardiac cycle happens during each heartbeat, as the heart muscle contracts and relaxes. Defibrillation sends energy to the heart at random times during the cardiac cycle. During cardioversion, shocks may be delivered at specific times. Cardioversion does have some risks.Blood clotsEither kind of cardioversion could knock loose blood clots created from your abnormal heartbeat. Before the procedure, your doctor may do a type of ultrasound to look for blood clots in your heart. You’ll probably get medicine to take for three to four weeks before and after the procedure to help prevent blood clots. Stroke If a clot travels to your brain, it can cause a stroke.Irritated skinThis often happens where the paddles are applied. The doctor can give you a cream to treat it.Cardioversion complicationsIt's unlikely, but there’s a small chance that cardioversion could damage your heart or lead to more arrhythmias.After cardioversion, you should wake up within five or 10 minutes. You'll stay in a recovery room for about an hour to be watched for complications. Most people go home the same day. You’ll be drowsy from the anesthesia, so someone will need to drive you home. Your doctor will typically prescribe medicine to thin your blood. Take this medication as directed, and do not stop it without first discussing it with your doctor.Electrical cardioversion often works, but it's not a cure for an abnormal heart rhythm. Your heart should return to a normal rhythm during the procedure, but it may not last. It's common for abnormal rhythms to happen again, so you may need to have more than one cardioversion. Electrical cardioversion success rate Electrical cardioversion is more than 90% effective, though many have AFib again shortly after having it. Taking an antiarrhythmic drug before the procedure can prevent this. How well it works depends on the size of your left atrium as well as how long you’ve been in AFib. If you have a large left atrium or you’ve been in constant AFib for a year or two, it may not work as well. Taking antiarrhythmic drugs can also prevent AFib after a successful electrical cardioversion.Chemical cardioversion success rate You should know quickly if it works. It usually takes effect within hours, but sometimes it takes days. If it doesn’t work for you, the doctor might suggest electrical cardioversion. Chemical cardioversion may not work as well as electrical cardioversion. It has a success rate of about 50%.Cardioversion can help treat AFib by taking the heart out of an abnormal rhythm and putting that rhythm back to normal. It can be done with medicine or while you’re under anesthesia using a machine called a cardioverter. The best option for you depends on what type of abnormal heartbeat you have, how long you've had it, and your overall health. How long does cardioversion take?An electrical cardioversion only takes a few minutes, but you’ll be at the hospital for several hours for preparation and recovery. Chemical cardioversion can take a few minutes, hours, or days to work. What should you not do after cardioversion?You shouldn’t drive yourself home after cardioversion. You’ll be groggy from anesthesia. You should be able to do all of your normal activities once the anesthesia wears off. What's next if cardioversion does not work?If you’ve already had a chemical cardioversion, then your doctor may recommend having an electrical cardioversion. If electrical cardioversion doesn’t work, your doctor may want to repeat the procedure, or try something else, such as catheter ablation. How many times can you have cardioversion?Some patients have a dozen or more cardioversions. There’s no limit to how many you can have. But if it’s not working, you or your doctor may decide to stop repeating the procedure. A cardioversion is a treatment which delivers an electrical energy (shock) to the heart using an external defibrillator to get the heart back into sinus rhythm. This is done by attaching electrodes (sticky pads) to the chest to deliver the electric shock.Cardioversion is very quick and can be very effective in many patients. In some patients, sinus rhythm can be maintained for several years and in others it can be much shorter. The length of time your sinus rhythm is maintained will depend on how long you have been in atrial fibrillation (AF) and other factors, such as how large your left atrium is.Cardioversion and anticoagulantsOnce you have your referral for cardioversion, you need to make sure that you have been taking your anticoagulant (such as warfarin or a direct oral anticoagulant) for at least 3-4 weeks before the procedure.WarfarinIf you are taking warfarin, you will need to have weekly INR levels between two and three for at least four consecutive weeks leading up to the planned cardioversion. If the levels fall below two before your cardioversion, we will need to delay your procedure. This is because your risk of stroke increases.If the levels have fallen below 2 prior to your cardioversion, you are at risk of a stroke and your procedure will need to be delayed. After the cardioversion you will need to continue your warfarin for at least four weeks, or indefinitely if you have a CHA2DS2VASc score ≥ 1. This will be reviewed at your next clinic appointment.Direct oral anticoagulantsIf you are taking one of the direct oral anticoagulants (dabigatran, rivaroxaban, apixaban or edoxaban) then you will need to take these as instructed for at least 3 to 4 weeks before the cardioversion. It is very important that you do not miss any doses of your anticoagulant as your risk of stroke will be increased and your procedure will need to be delayed.Before the procedureYou will have a telephone pre-admission appointment prior to your cardioversion. This appointment is a nurse-led clinic run by the arrhythmia nurse specialists, who will take a full medical history, including your INR levels (if you are taking warfarin) and your current medication list. The procedure will be explained to you during this appointment and you will also be told if there is any medication that you should not take before the procedure.The procedureYou will be admitted to the day care unit or cardiology ward on the morning of your cardioversion. A doctor or clinical nurse specialist will examine you to ensure you are fit for the procedure. An ECG (electrocardiogram) will be taken to confirm that the arrhythmia is still present. The procedure will be explained to you again and you will be asked to sign a consent form.Once we have confirmed that you are ready for the procedure, you will be taken to another department. You will be met by the anaesthetist and a doctor or nurse who will explain what they are going to do.Two electrode patches will be placed on the upper right and lower left side of the chest and this will be attached to the defibrillator. A cannula (small needle) will be put in the back of your hand or in your arm. You will be given a short general anaesthetic to put you to sleep. The defibrillator is then charged and ready to deliver a shock. One shock can be sufficient to restore sinus rhythm. However, a small number of people may require further shocks, and a small percentage of patients will remain in AF despite several attempts.Like any intervention there are possible risks. These include:Stroke - this is rare if the INR levels have been within the therapeutic range of 2-3 / or you have been taking your DOAC for at least three consecutive weeks.Bradycardia - this is normally very brief following the cardioversion. A small percentage of patients may require intravenous medication or external pacing of the heart via the two electrodes that delivered the shock. In very rare cases, a permanent pacemaker may be required.Ventricular tachycardia - this is rare but can occur following the initial shock and would require a further shock to establish sinus rhythm.Skin burns from the electrode pads - this is rare but should this occur you will be given a cream to apply to the affected areas.We will admit you to the day case unit/cardiology ward the morning of your cardioversion. You will then meet one of our doctors or clinical nurse specialists. They will take a full medical history, do blood tests including checking your INR levels and make sure that you are fit for the procedure.We will do an ECG (electrocardiogram) to confirm that the arrhythmia is still present. We will then explain the procedure and ask you to sign a consent form. Once we have confirmed that you are ready for the procedure, we will take you to another department. You will meet the anaesthetist and a doctor/nurse who will explain what they are going to do. We will place two electrode patches on the upper right and lower left of your chest. These are then attached to the defibrillator. A cannula (small needle) is put into the back of your hand or in your arm. The anaesthetist will give you a short general anaesthetic to put you to sleep.The defibrillator is then charged and ready to deliver a shock. One shock can be enough to restore sinus rhythm. But for a small number of people, they will need more shocks. Also for a small percentage of patients, they will remain in AF even after several attempts. Like any intervention, there are possible risks. These include:Stroke - this is rare if INR levels have been within the therapeutic range of two to three for at least three consecutive weeksBradycardia - this is normally very brief following the cardioversion. A small percentage of patients may need intravenous medication or external pacing of the heart via the two electrodes that delivered the shock. In very rare cases, the patient may need to have a permanent pacemaker.Ventricular tachycardia - this is rare but can occur following the initial shock. You would need a further shock to establish sinus rhythm.Skin burns from the electrode pads - if this occurs, we will give you a cream to apply to the affected areasAfter the procedureAfter your procedure, we will take you back to the day-case unit/ward to recover.You will be monitored for up to 4 hours before being allowed to go home. An ECG will be taken prior to discharge to ensure you have remained in sinus rhythm.You will need someone to collect you, as you are not allowed to drive for 24 hours following this procedure.You will be seen in clinic by either your doctor or clinical nurse specialist approximately 2 -3 months following your cardioversion. If your discharge ECG shows AF, you will be booked back into clinic earlier to discuss further treatment options. link to Heart and Stroke Facebook Instagram Twitter Youtube Cardioversion is the process of restoring the heart’s normal rhythm from an abnormal rhythm. It is also referred to as the application of direct-current or DC current for cardioversion. Cardioversion is similar to defibrillation, but uses much lower levels of electricity. Most elective cardioversions are performed to treat atrial fibrillation, a rhythm disturbance of the upper chambers (atria) of the heart. Atrial fibrillation usually is not life-threatening, but can result in less efficient blood pumping and irregular or fast heartbeat. It can be treated with antiarrhythmic medications or with electrical intervention. In this section, we will discuss electrical cardioversion. One of the challenges with atrial fibrillation is it’s hard to detect. In some people, it comes and goes. Read more What is done? Cardioversion is performed by placing two external paddles on the patient’s chest or with one on the chest and one on the back. A selected amount of energy jolts or electrical pulses is then sent from the paddles through the body to the heart. The energy jolts the heart out of atrial fibrillation and back into normal rhythm. Beat heart disease. Join the fight to end heart disease and stroke. Electrical cardioversion is performed in a hospital setting, such as an intensive care unit, recovery room, emergency room or a special procedure room. Usually, it is an elective procedure and scheduled ahead of time. A week or so before your procedure, you will probably be asked to visit your hospital. Blood tests, urine tests, an electrocardiogram, and other tests may be performed. A transesophageal echocardiography (TEE) procedure may be advised to look for existing clots in the atria. If you have atrial fibrillation, most patients need to be on blood thinners and be well anticoagulated for several weeks prior to the cardioversion. Your doctor will explain the risks and benefits of the procedure and you will be asked to sign a consent form. You should have nothing to eat or drink for at least eight hours before the procedure. Unless your doctor has told you otherwise, take your regularly scheduled medications the morning of the procedure but with as little water as necessary. Do not apply any lotions or ointments to your chest or back, as they might interfere with the adhesiveness of the shocking pads. Before the procedure starts, inform your doctor if you: have ever had a reaction to any contrast dye, iodine, or any serious allergic reaction, for example, from a bee sting or from eating shellfish have asthma are allergic to any medication have any bleeding problems or are taking blood-thinning medication have a history of kidney problems or diabetes have body piercings on your chest and/or abdomen have had any recent changes in your health are, or may be, pregnant. Because the shock may be uncomfortable, sedation is administered intravenously by an anesthesiologist or specially trained nurse. Once you are sedated: The pads will be positioned and the shock administered. Additional shocks at higher energy levels can be delivered if the first shock does not restore the rhythm back to normal. Minor skin irritation can occur at the site of the cardioversion pads. Patients generally wake quickly and without any memory of the shocks. Cardioversion is usually performed as an outpatient procedure, so you will most likely go home the same day. Since you require sedation for the procedure, it is important to arrange a ride home. For the remainder of the day, you should not operate a car or heavy machinery or make any important decisions. Cardioversion and defibrillation are both medical procedures used to restore normal heart rhythm in patients with abnormal heart rhythms or arrhythmias. However, they differ in terms of the type of arrhythmia they treat and the energy levels used. Cardioversion is typically used for treating less severe arrhythmias, such as atrial fibrillation or atrial flutter, where an electrical shock is delivered at a synchronized time with the patient's heartbeat to restore normal rhythm. On the other hand, defibrillation is used for more life-threatening arrhythmias, such as ventricular fibrillation or pulseless ventricular tachycardia, where an unsynchronized high-energy shock is delivered to the heart to stop the abnormal rhythm and allow the heart to restart with a normal rhythm. Cardioversion and defibrillation are two medical procedures used to treat abnormal heart rhythms, also known as arrhythmias. While both procedures involve delivering an electric shock to the heart, they differ in terms of their purpose, technique, and the type of arrhythmias they are used to treat. In this article, we will explore the attributes of cardioversion and defibrillation, highlighting their similarities and differences.CardioversionCardioversion is a procedure used to convert an abnormal heart rhythm back to a normal rhythm. It is typically performed in cases of atrial fibrillation, atrial flutter, or supraventricular tachycardia. During cardioversion, a controlled electric shock is delivered to the heart, either externally through paddles placed on the chest or internally through electrodes inserted into the heart.The electric shock delivered during cardioversion is synchronized with the patient's heartbeat, ensuring that it is delivered during the refractory period of the cardiac cycle. This synchronization minimizes the risk of inducing ventricular fibrillation, a potentially life-threatening arrhythmia. The energy level used in cardioversion is lower than that used in defibrillation, typically ranging from 50 to 200 joules.Cardioversion is usually performed under sedation or general anesthesia to minimize discomfort and prevent the patient from feeling the shock. The procedure is relatively quick, lasting only a few minutes, and the patient is closely monitored before, during, and after the procedure to ensure the heart rhythm has been successfully restored.DefibrillationDefibrillation, on the other hand, is a procedure used to treat life-threatening arrhythmias, particularly ventricular fibrillation and pulseless ventricular tachycardia. Unlike cardioversion, defibrillation is an emergency procedure performed when the heart rhythm is chaotic and ineffective, leading to a lack of blood flow to vital organs.During defibrillation, a high-energy electric shock is delivered to the heart, aiming to depolarize the entire myocardium and allow the heart's natural pacemaker to regain control. The shock is delivered as quickly as possible, without synchronization to the patient's heartbeat, to interrupt the chaotic rhythm and restore a normal heartbeat.The energy level used in defibrillation is significantly higher than that used in cardioversion, typically ranging from 200 to 360 joules. The shock is delivered through paddles or electrode pads placed on the chest, and the procedure is often performed in conjunction with cardiopulmonary resuscitation (CPR) to maximize the chances of successful resuscitation.SimilaritiesWhile cardioversion and defibrillation differ in their purpose and technique, they also share some similarities. Both procedures involve the delivery of an electric shock to the heart, aiming to restore a normal heart rhythm. They are performed in a controlled environment, with medical professionals closely monitoring the patient's vital signs and response to the procedure.Additionally, both cardioversion and defibrillation require the use of specialized equipment, such as defibrillators, to generate and deliver the electric shock. These devices are capable of delivering the appropriate energy levels and can be adjusted based on the patient's condition and response.DifferencesWhile cardioversion and defibrillation have similarities, they also have distinct differences. The primary difference lies in the purpose of the procedures. Cardioversion is used to convert an abnormal heart rhythm back to a normal rhythm, while defibrillation is used to treat life-threatening arrhythmias and restore a functional heartbeat.Another difference is the type of arrhythmias each procedure is used for. Cardioversion is typically performed for atrial fibrillation, atrial flutter, or supraventricular tachycardia, which are generally not immediately life-threatening. On the other hand, defibrillation is used for ventricular fibrillation and pulseless ventricular tachycardia, which can quickly lead to cardiac arrest and death if not treated promptly.The energy levels used in cardioversion and defibrillation also differ. Cardioversion utilizes lower energy levels, ranging from 50 to 200 joules, while defibrillation requires higher energy levels, typically ranging from 200 to 360 joules. This difference in energy levels reflects the varying goals of the procedures, with cardioversion aiming to restore a normal rhythm and defibrillation aiming to interrupt a life-threatening arrhythmia.ConclusionIn summary, cardioversion and defibrillation are two distinct procedures used to treat abnormal heart rhythms. Cardioversion is performed to convert an abnormal rhythm back to a normal rhythm, while defibrillation is used to treat life-threatening arrhythmias and restore a functional heartbeat. They differ in terms of purpose, technique, energy levels, and the type of arrhythmias they are used for. Both procedures, however, play crucial roles in managing cardiac arrhythmias and improving patient outcomes. Comparisons may contain inaccurate information about people, places, or facts. Please report any issues. Have you ever watched a medical drama and heard someone yell, “Clear!” before delivering a shock?That scene likely depicts cardioversion or defibrillation, two life-saving procedures for certain types of arrhythmias. Though both involve electrical shocks to the heart, they serve different purposes.Let’s break down cardioversion vs. defibrillation, when to use them, and what every nursing student needs to know.Cardioversion is a medical procedure that restores a normal heart rhythm in clients with certain arrhythmias, such as atrial fibrillation (AFib) or atrial flutter (AFlutter).The goal is to synchronize the heart’s electrical activity and get it back to a normal sinus rhythm.There are two types of cardioversion – chemical and electrical.This involves delivering a synchronized shock to the heart timed with the client’s QRS complex to avoid shocking during the vulnerable T wave.The procedure is for AFib, atrial flutter, or stable ventricular tachycardia and is performed under sedation.This type doesn’t involve electrical shocks but uses antiarrhythmic medications like amiodarone, procainamide, or adenosine to convert the heart to a normal rhythm.This is for clients who are stable but require rhythm control.Defibrillation is for emergencies when a client experiences life-threatening arrhythmias, such as ventricular fibrillation (VFib) or pulseless ventricular tachycardia (VT).Unlike cardioversion, defibrillation delivers an unsynchronized shock — meaning it doesn’t pay attention to the heart’s natural rhythm.Here are some of the key differences between these two procedures.FeatureCardioversionDefibrillationPurposeCorrects stable arrhythmias (AFib, AFlutter, stable VT)Treats life-threatening arrhythmias (VFib, pulseless VT)SynchronizationSynchronized with QRS complexUnsynchronized, immediate shockClient statusUsually conscious and sedatedUnconscious and pulselessIf you’re still a bit fuzzy on synchronized cardioversion vs. defibrillation, here’s how to clear it up:Synchronized cardioversion: Focused, controlled, and works with the heart’s rhythm.Defibrillation: Everyone out of the way! It shocks the heart regardless of rhythm and is used only for severe arrhythmias.One focuses on precision; the other is all about speed.Cardioversion = Countable pulse.Defibrillation = Doesn’t have a pulse.The tools used for cardioversion and defibrillation are similar but have different purposes.Here’s the difference between cardioversion vs. defibrillator.Manual defibrillator with sync mode: Often used in hospital settingsElectrocardiogram (ECG) monitoring: Used to time shock deliveryManual defibrillator: Used in hospitals and advanced life support settingsAnother way to contrast cardioversion vs. defibrillator techniques is how much energy they use.Cardioversion: Uses lower energy levels (50-200 joules) and synchronizes with the heart’s rhythmDefibrillation: Delivers higher energy shocks (200-360 joules) and doesn’t synchronize with the rhythmThe setup for each procedure differs as well. Cardioversion often involves conscious sedation, while defibrillation is performed during emergencies, often on an unresponsive client.Both procedures come with potential complications that nurses should be aware of:Cardioversion risks: Skin burns, thromboembolism (especially in untreated AFib lasting over 48 hours), and transient arrhythmiasDefibrillation risks: Skin burns, myocardial damage, and broken ribs (if treatment involves CPR)Understanding when to use cardioversion vs. defibrillation is essential for nursing students.Let’s look at real-world scenarios where you might encounter these interventions:Client status: Conscious, experiencing palpitations, and maintaining stable blood pressureAction: Perform synchronized cardioversion under sedation to restore a normal rhythm.Client status: Collapsed, unresponsive, pulseless, and abnormal rhythm on the monitorAction: Deliver immediate defibrillation with high energy to attempt rhythm restoration.Client status: Stable but experiencing persistent VT that’s unresponsive to antiarrhythmic drugs.Action: Consider synchronized cardioversion to convert the rhythm safely.While the actors in those medical dramas look like pros, mastering these complex nursing concepts in real life requires dedication and practice.That’s where SimpleNursing comes in.We offer:Step-by-step guidanceVideo tutorialsPractice questionsAnd moreOur simplified approach helps nursing students grasp complex concepts and prepare for real-world scenarios.Join SimpleNursing today and make learning stress-free!