Cardiac Devices

Background

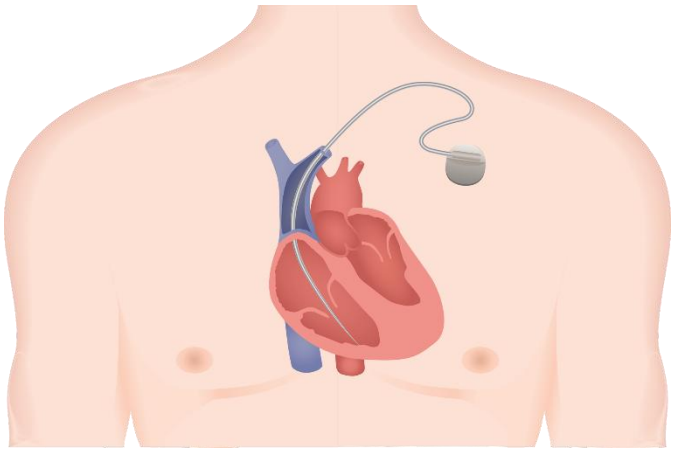
Cardiac devices can help monitor or control heart irregularities or rhythm disorders. A cardiac device is considered when the heart's electrical system is not functioning properly and usual treatments like medications and lifestyle changes have not been effective.

Cardiac devices differ based on their use, function and placement. Some options are permanent implantable devices while others are portable temporary monitors. Most cardiac devices implanted under the skin are surgically placed in the upper chest just under the clavicle. In infants and children, cardiac devices can also be placed in the abdomen as the abdominal fat can protect the device and wires from everyday activity and possible injury.

CARDIAC DEVICES USED TO MONITOR heart irregularities or rhythm disorders include portable and implanted monitors. A portable monitor (e.g., Holter) is a small device that connects to electrodes placed on the chest. An implanted monitor (e.g., Loop) can be used to remotely monitor a person with unexplained fainting spells or certain types of irregular heartbeat. It can record continuously for up to three years.

CARDIAC DEVICES USED TO TREAT heart irregularities or rhythm disorders include an implanted cardioverter defibrillator, implanted pacemaker and ventricular assist device.

- Implanted cardioverter defibrillator (ICD): A small defibrillator device to treat patients who have, or are at risk of, developing abnormally fast heart rhythms that can lead to cardiac arrest. An ICD monitor continuously monitors heart rhythm for 24 hours and sends a small electric signal to deliver a shock when fast heart rhythms are detected. An ICD can also treat slow heart rhythms.
- Pacemaker: A small, implanted battery-powered device used to treat patients with irregular or abnormally slow rhythms. A pacemaker produces an electrical signal that stimulates the heart and causes it to beat.
- Ventricular assist device (VAD): Used to help children with acute heart failure while awaiting a heart transplant. A VAD is a surgically implanted pump that supports the left ventricle, right ventricle, or both to pump blood to the body. An external driveline exits the body with a VAD through the abdomen and attaches to a battery pack worn by the child.



Top Takeaways for School

Cardiac devices can be used to monitor or treat heart irregularities or rhythm disorders. Devices may be portable or surgically implanted which may require use of external electrodes or wires.

Any potentially life-threatening cardiac medical emergency can develop in individuals with a history of cardiac disorder. Staff should be prepared with CPR and AED training.

Some electromagnetic fields may potentially affect certain cardiac devices. Refer to the manufacturer or specific device manual for safety considerations.

A student's activity level is usually not restricted, as the type of device could be measuring or responding to the student's routine activity level.

The student may need to record their activities throughout the day. Noting periods of physical activity and rest may be important for the healthcare provider.

Considerations for the Individualized Healthcare Plan (IHP)

- Nursing diagnoses: Risk for ineffective peripheral tissue perfusion and risk for decreased cardiac tissue perfusion
- Nutrition interventions and equipment (consider fluid intake goal to avoid dehydration causing arrhythmias)
- Assessment of implanted medical device (consider location, date of surgical placement, and device-specific information)
- Activity, positioning, transferring (consider precautions and/or restrictions)
- Equipment troubleshooting (consider equipment/device user manual, battery, charger)
- Consider emergency action plans (EAPs) and emergency evacuation plans (EEPs) related to special health care needs, including staff education/training

Discussion Starters for the Educational Team

1. Would the student benefit from evaluations or assessments in any of the following areas: physical therapy, occupational therapy, speech and language therapy, assistive technology, adapted physical education, functional behavior, psychology, hearing and vision?
2. Would the student benefit from additional academic support and/or modified education (e.g., copies of notes, extra time, reduced workload, simplified instructions, alternative formats for presentation of material, 504/IEP)?
3. Would schedule flexibility support the student?
4. Can rest breaks, safe spaces or reduced stimulation times be built into the student's schedule?
5. Will staff receive education/training to implement the student-specific emergency plan?

Resources

Children's Hospital of Philadelphia Pediatric Pacemakers & Implantable Cardioverter Defibrillators (ICD)
chop.edu/treatments/pacemakers-and-implantable-cardioverter-defibrillators-icds

Johns Hopkins Medicine: Loop Recorder Information
hopkinsmedicine.org/health/treatment-tests-and-therapies/loop-recorder-implantation

Medtronic: Electromagnetic Compatibility Guide Patient Services for Implantable Cardiac Devices
medtronic.com/en-us/l/patients/electromagnetic-guide.html

Sudden Arrhythmia Death Syndromes Foundation (SADS): Information for School Health Professionals
sads.org/Awareness/School-Nurses#Care_Plans

For more information, please scan the QR code or visit: KennedyKrieger.org/SHNIC

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