HEALTH TECH

HEALTHCARE IN HEART DISEASES

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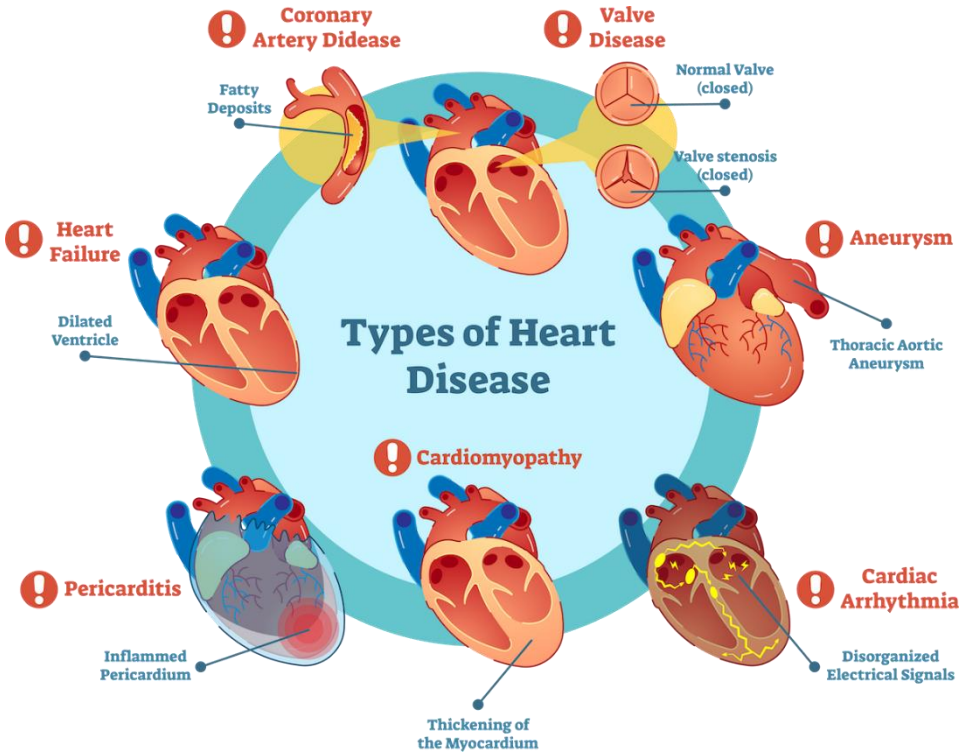
1. Service description[(1)]

In heart diseases, or cardiology, treatments requiring specialist medical care.

Adult patients are investigated and treated

- Coronary artery disease (coronary angiography, perfusion imaging, CT scans, pharmacological therapy for coronary artery disease, balloon angioplasty, bypass surgery)
- Arrhythmias (pharmacological therapies, pacemaker treatments, ablation therapies)
- Diseases of the cardiac valves
- Cardiac insufficiency (ventricular assist device therapy, heart transplant)
- Cardiomyopathy and myocarditis
- Congenital heart diseases
- Hereditary heart diseases



Source: www.udmi.net/cardiovascular-disease-risk

Anyone can seek treatment on the basis of a physician's referral, regardless of their place of residence in Finland.

2. Description of the operating environment[(2)]

Diagnosis

Your health care provider will examine you and ask about your personal and family medical history.

Many different tests are used to diagnose heart disease. Besides blood tests and a chest X-ray, tests to diagnose heart disease can include:

- **Electrocardiogram (ECG or EKG):** Records the electrical signals in the heart.
- **Holter monitoring:** A portable ECG device that's worn for a day or more to detect irregular heartbeats that aren't found during a regular ECG exam.

- **Echocardiogram:** Create detailed images of the heart in motion. An echocardiogram can help determine if a valve is narrowed or leaking.
- **Exercise tests or stress tests:** Exercise tests help reveal how the heart responds to physical activity and whether heart disease symptoms occur during exercise.
- **Cardiac catheterization:** This test can show blockages in the heart arteries.
- **Heart (cardiac) CT scan:** Collects images of your heart and chest.
- **Heart (cardiac) magnetic resonance imaging (MRI) scan:** Create detailed images of the heart.

Treatment

Heart disease treatment depends on the cause and type of heart damage. Healthy lifestyle habits — such as eating a low-fat, low-salt diet, getting regular exercise and good sleep, and not smoking — are an important part of treatment.

- **Medications**

If lifestyle changes alone don't work, medications may be needed to control heart disease symptoms and to prevent complications. The type of medication used depends on the type of heart disease.

- **Surgery or other procedures**

Some people with heart disease may need a procedure or surgery. The type of procedure or surgery will depend on the type of heart disease and the amount of damage to the heart.

3. Treatments[3]

Surgery

Undergoing heart surgery can help treat blockages and heart problems when medications are not effective.

Some common types of surgery include:

- **Coronary artery bypass surgery:** Coronary artery bypass grafting is the most common surgery. A surgeon can use a healthy blood vessel from another part of the body to repair a blocked one.
- **Coronary angiography:** This is a procedure that widens narrow or blocked coronary arteries. It is often combined with the insertion of a stent, which is a wire-mesh tube that allows easier blood flow.
- **Valve replacement or repair:** A surgeon can replace or repair a valve that is not functioning correctly.
- **Repair surgery:** A surgeon can repair congenital heart defects, aneurysms, and other problems.
- **Device implantation:** Pacemakers, balloon catheters, and other devices can help regulate the heartbeat and support blood flow.
- **Laser treatment:** Transmyocardial laser revascularization can help treat angina.
- **Maze surgery:** A surgeon can create new paths for electrical signals to pass through. This can help treat atrial fibrillation.

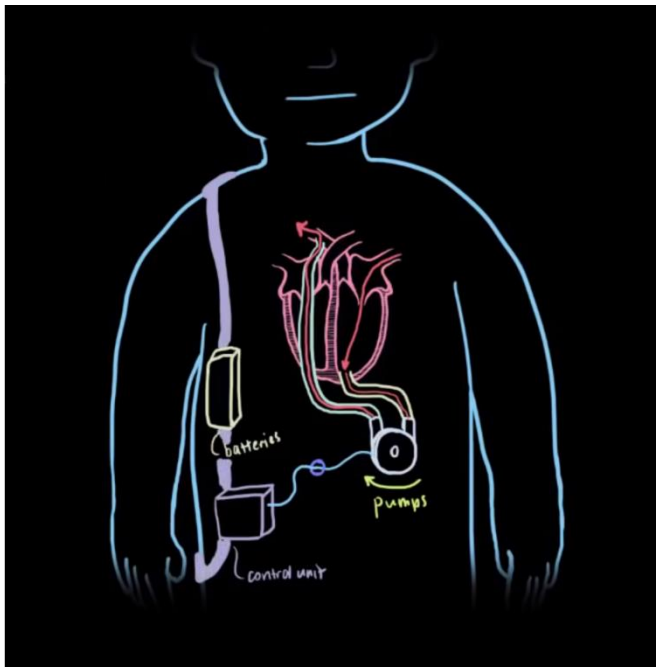
4. Device

Device implantation - Ventricular Assist Device (VAD)[4]

This device assists the patient's ventricles when the ventricles aren't pumping very well and sometimes could replace the ventricles. There are 2 kinds which are LVAD (Left VAD) and RVAD (Right VAD) for each ventricle or BiVAD for both ventricles.

How it works

A small tube is attached to the ventricle that needs help. The blood, instead of exiting out the artery, is rerouted into the VAD. The VAD then pumps the blood out through the next tube which connects up with the artery and then leaves the heart.



The VADs are usually connected to a small control unit outside of the body. A cable goes from the inside, connected to the VAD through a small hole in the abdomen and the VAD is also connected to some batteries. The control unit and the batteries are usually worn with straps over the body.

Depending on the VAD it may pump blood rhythmically (like heart does) or pump blood continuously.

Implantable VADS are usually reserved for people who are waiting for a heart transplant or as a long term solution for those who can't have a heart transplants.

References

(1) www.hus.fi/en/patient/treatments-and-examinations/heart-diseases
(2) www.mayoclinic.org/diseases-conditions/heart-disease/diagnosis-treatment/drc-20353124
(3) www.medicalnewstoday.com/articles/237191#treatments
(4) www.youtube.com/watch?v=1q06qHX1K-I