



Cardioversion

Debbie Sevant

BHF Arrhythmia Nurse Specialist

Essex Cardiothoracic Centre



Cardioversion

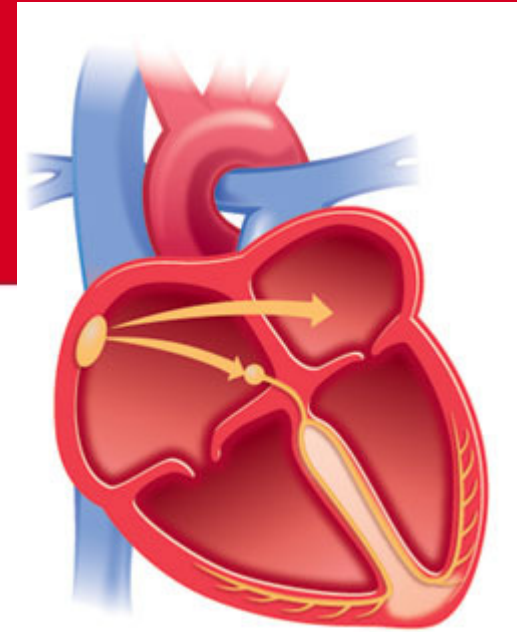
- Safe and effective treatment to restore the heart to a normal rhythm
- Common treatment for Atrial Fibrillation
- Other rhythms may be cardioverted
- Treatment protocols vary



Case Study

- A 45 year old lady with a history of diabetes presented to her GP with shortness of breath and fatigue.
- Examination revealed an irregular pulse.
- ECG revealed Fast Atrial Fibrillation, heart rate 140 bpm.

Why do I need Cardioversion ?



- Normal Conduction
- AF - chaotic electrical activity
- Causes fibrillation of atria of the heart
- Loss of atrial kick / contraction
- Can cause Symptoms & Complications



Symptoms

- Asymptomatic
- Mild to severe
- GP, clinic, urgent treatment
- SOB
- Fatigue
- Dizziness
- Syncope
- Chest pain



Complications of AF

- Risk of blood clots
- 5 fold increased risk of stroke
- Aspirin Warfarin
- Risk stratification CHAD, NICE



Initial Treatment of AF

- Control Heart Rate < 80bpm at rest
 - Beta Blockers
 - Calcium Antagonists
 - Digoxin
 - Emergency - Cardioversion



Initial Treatment of AF

- Reduce risk of Blood Clots
 - Aspirin
 - Warfarin



Who is suitable for Cardioversion?

- **Heart Rate Control**

- Patients over 65
- Patients with coronary heart disease
- Patients unsuitable for cardioversion
- Patients who can't take antiarrhythmic drugs
- No Symptoms

- **Cardioversion**

- Presenting for the first time with lone AF
- Younger patients
- Patients with Symptoms
- Patients with AF secondary to another cause eg. Thyroid abnormality, post surgery

History of Cardioversion

- *1775* Abildgaard showed that hens could be made lifeless with electrical impulses and he could restore a pulse with electrical shocks across the chest.



First Cardioversion

- **1947 Claude Beck**
pioneering cardiovascular surgeon
in Cleveland, successfully
defibrillates a human heart during
cardiac surgery. The patient was a
14 year old boy

His prototype defibrillator followed
experiments on defibrillation in
animals performed by Carl J.
Wiggers,





Chemical Cardioversion

- **Cardioversion can be “chemical” or “electrical”**
- **Chemicals alter the heart’s electrical properties to suppress the abnormal heart rhythms and restore a normal rhythm**
- **In- Patient**
- **Out-Patient**
- **Common – Amiodarone, Sotalol, Flecainide**



Direct Current Cardioversion

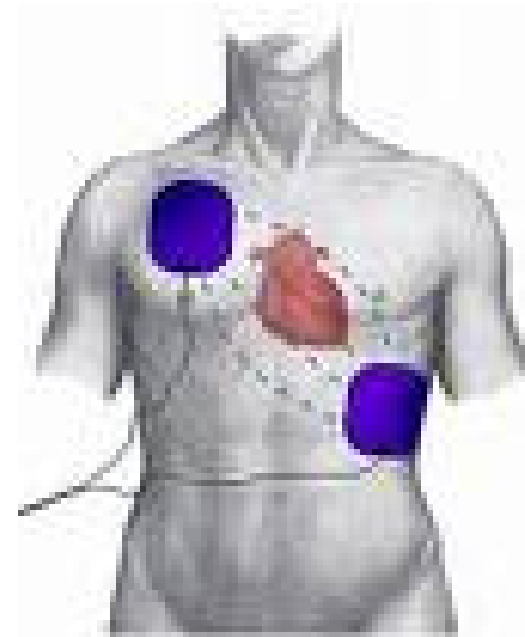
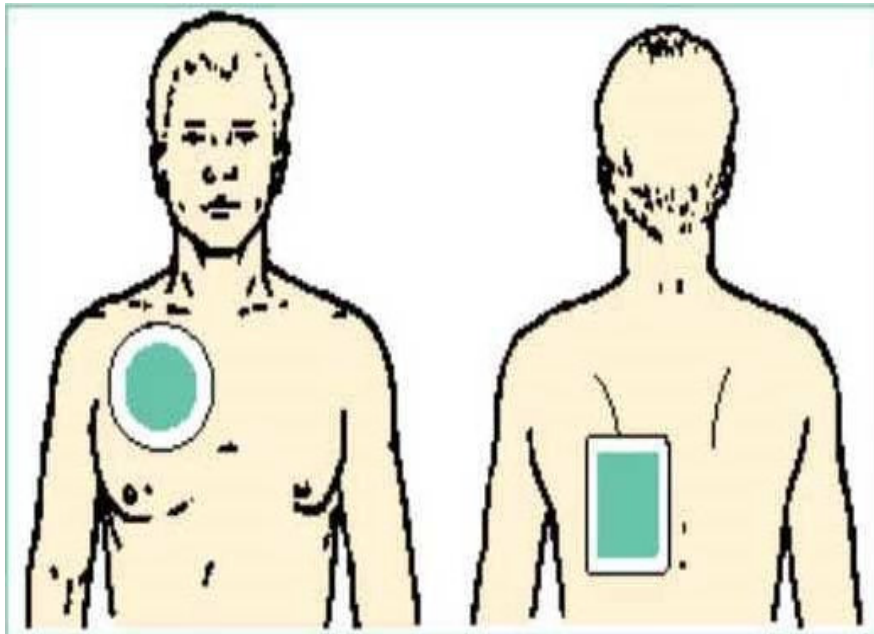
- Electrical cardioversion - a synchronized electrical current (shock) is delivered through the chest wall to the heart through special electrodes or paddles that are applied to the skin of the chest and back
- Interrupt the abnormal electrical circuit(s) in the heart and to restore a normal heart beat



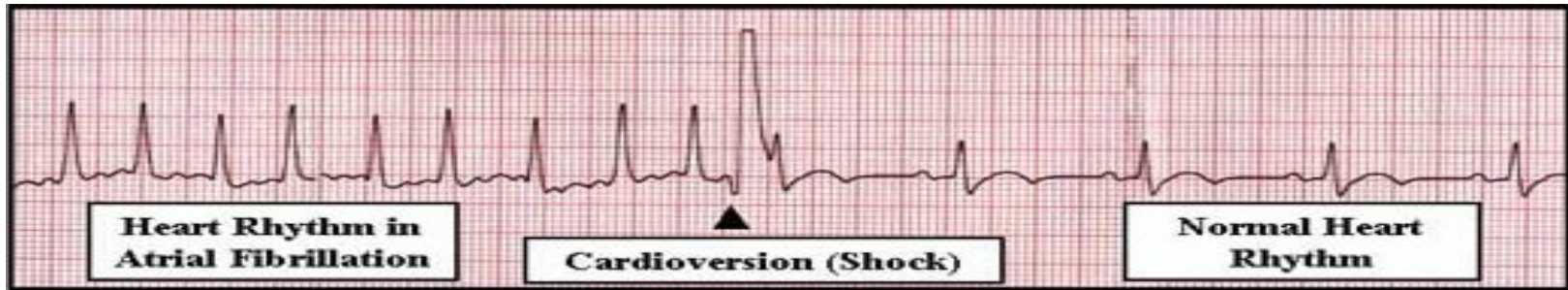
Procedure

- Hospital Setting Day case
- Nurse, Anaesthetist, ODA, “Cardiologist”
- Warfarin levels prevent stroke
- TOE
- GA or Sedation
- Fast 6 hours
- Take all medication that day except diabetic

Paddle Position



Result



- Synchronised
- Amount of Joules
- Success 99.4% locally – biphasic technology



Recovery

- Minor skin burn – common
- Arrhythmia - bradycardia
- Clot Event 1 in 100
- Anaesthetic Effect
- Do NOT drive 24 hours
- No important decisions 24 hours
- Accompanied home
- Pacemaker Check



How effective is it ?

- 50% recurrence within a year
- Increased risk of recurrence with repeat procedures
- Follow Up
 - Often none
 - NICE : 1 month & 6 months
 - RAAF Experience
 - Consider Ablation



Case Study

- A 45 year old lady with a history of diabetes presented to her GP with shortness of breath and fatigue.
- Examination revealed an irregular pulse.
- ECG revealed Fast Atrial Fibrillation, heart rate 140 bpm.
- Atenolol 25mg od was commenced to reduce her heart rate.



Case Study

- A referral was made to the local Rapid Access AF Clinic and Warfarin was commenced
- The Patient was seen in the Rapid Access AF Clinic **2 weeks after referral**
- Echocardiogram at that clinic showed a normal heart
- Admission for DC Cardioversion was arranged once INR was within range
- **Referral to Treatment 12 weeks**



Case Study

- This lady successfully cardioverted to normal rhythm with one 200 joule shock
- She was seen 3 months after DC cardioversion in the AF follow up clinic
- ECG showed normal rhythm and warfarin was stopped