



HKU successfully performs the first implant of a subcutaneous implantable cardioverter defibrillator in Asia

**Press Conference
April 16, 2014**



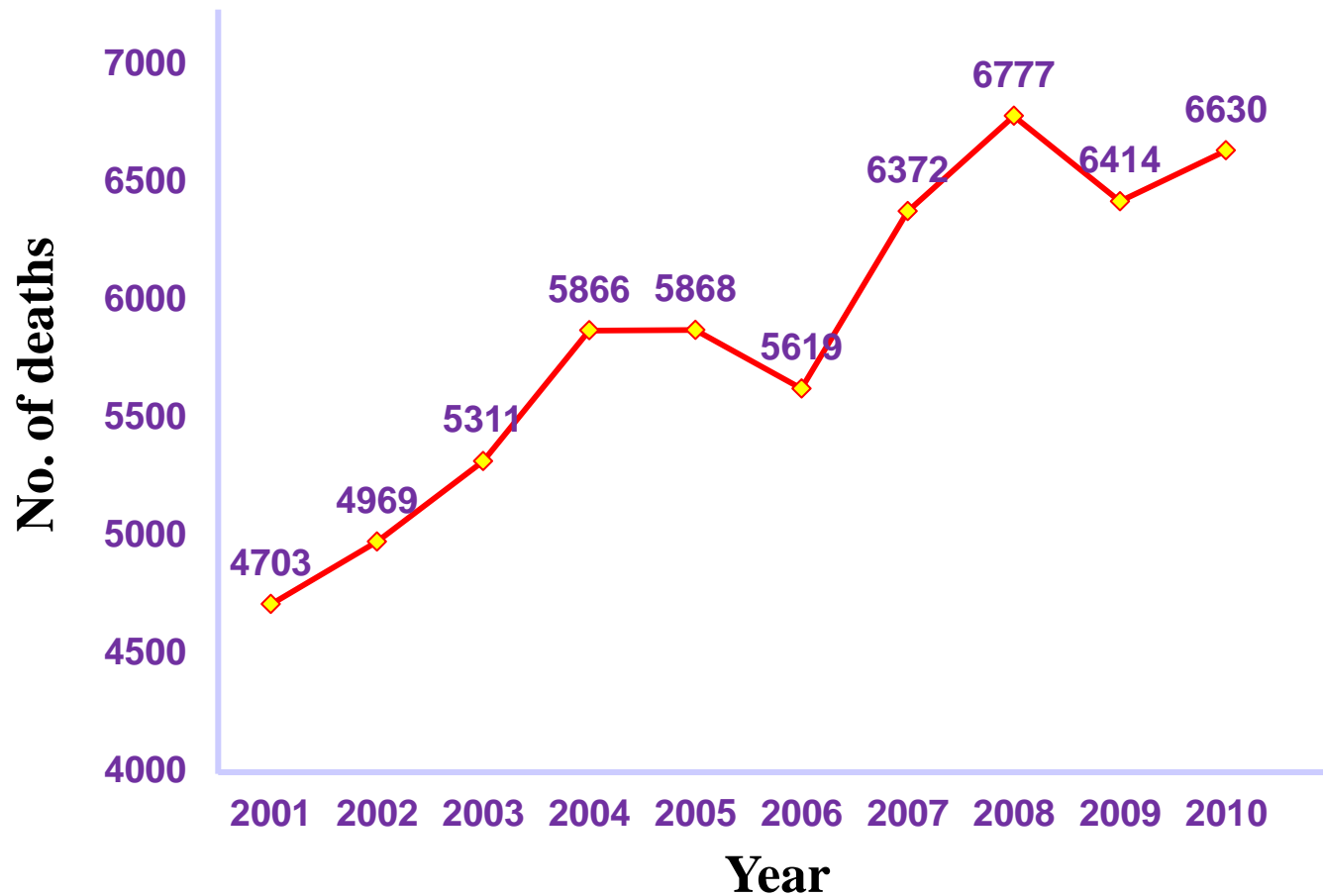
Speakers

- **Professor Tse Hung-fat**
William M W Mong Professor in Cardiology
Chair Professor
Department of Medicine
Li Ka Shing Faculty of Medicine, HKU
- **Dr David Siu Chung-wah**
Clinical Associate Professor
Department of Medicine
Li Ka Shing Faculty of Medicine, HKU



Increasing Heart Disease Mortality in HK

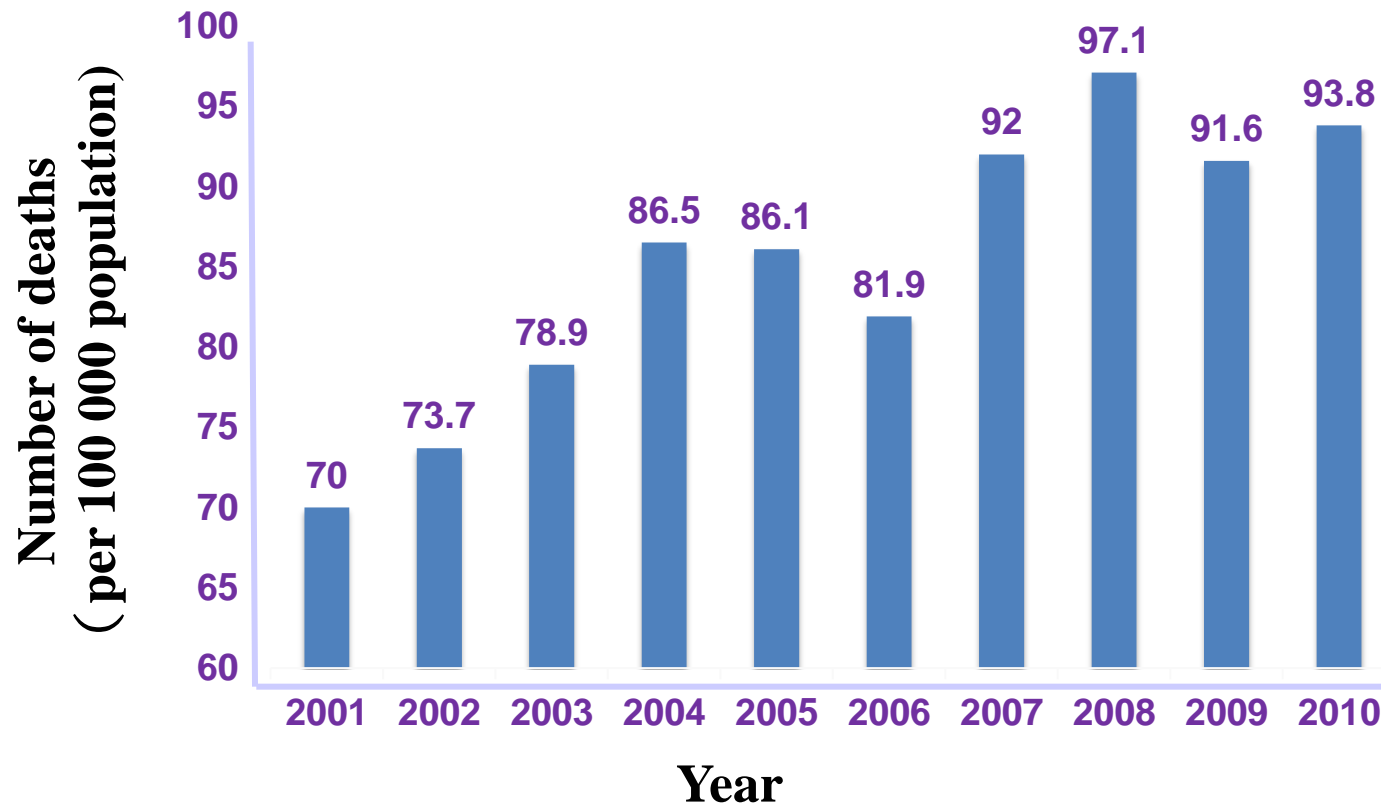
No. of deaths of heart diseases (per year)



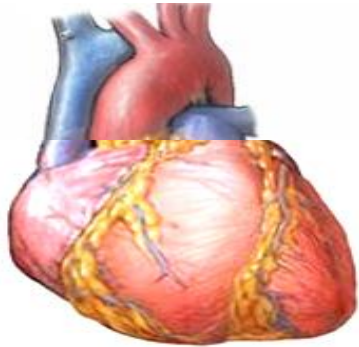


Increasing Heart Disease Mortality in HK

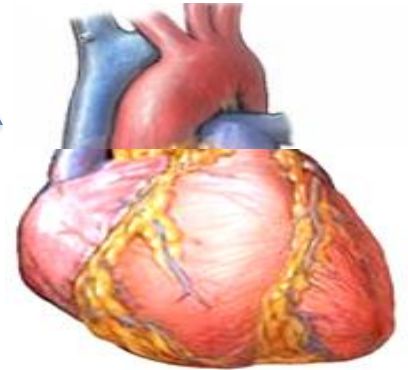
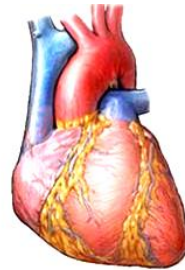
No. of deaths of heart diseases



Mechanisms leading to death in heart diseases



Heart Failure



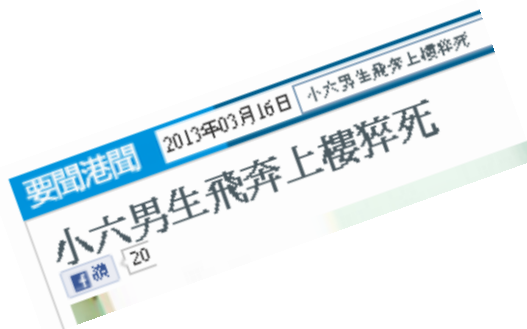
Arrhythmias





Sudden Cardiac Death (SCD)

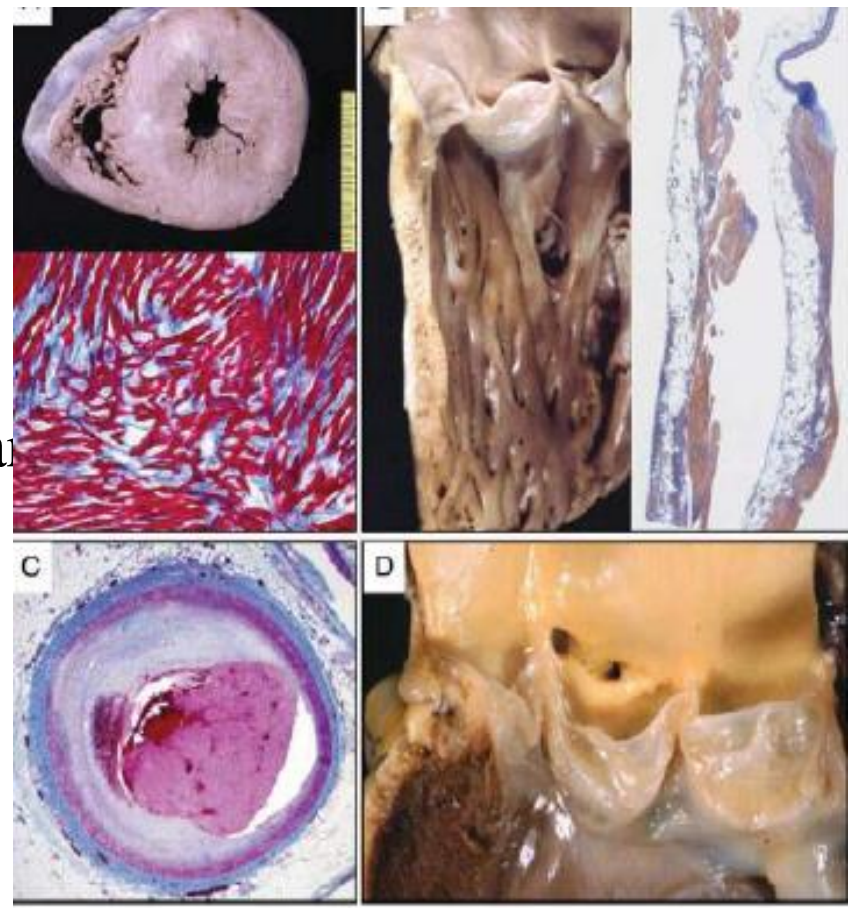
- SCD is unpredictable, and there is few warning signs for SCD, thus, it is often known as the “silent killer”
- SCD is a serious condition, which if not treated within minutes, can lead to death
- About 85% to 95% of people who have SCD die before they reach hospital





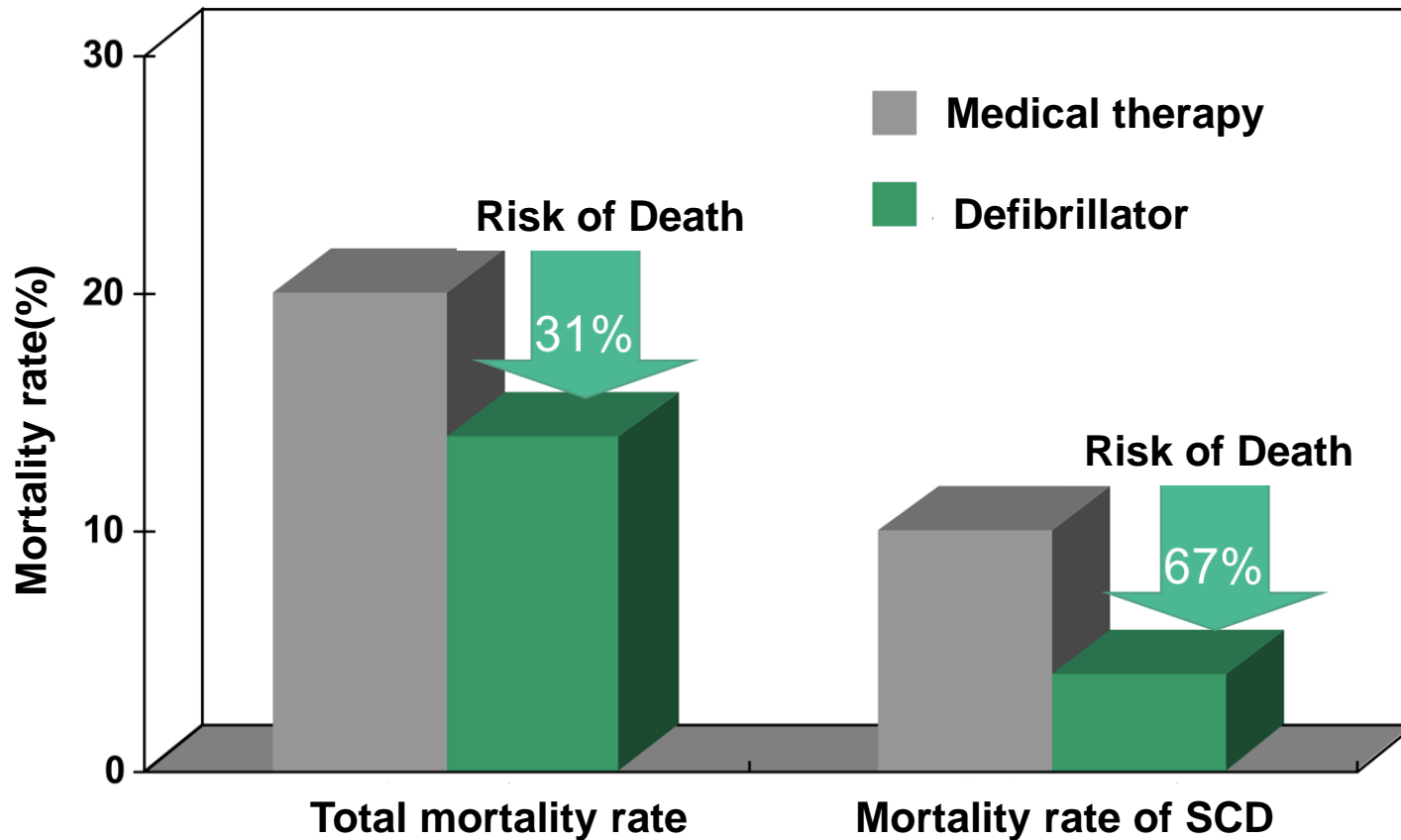
Causes of SCD

- Coronary artery anomalies
- Hypertrophic cardiomyopathy
- Myocardial Infarction
- Heart valve disease
- Aortic valve stenosis
- Arrhythmogenic right ventricular dysplasia
- Congenital heart disease
- Congenital cardiovascular
- WPW syndrome, Brugada syndrome, Long QT syndrome, Idiopathic VT





How to avoid SCD?

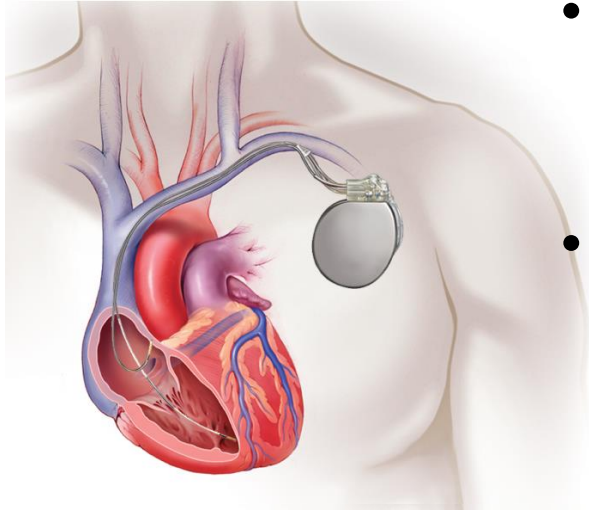


Average 20 months follow-up (Premature termination)

Moss AJ, N Engl J Med 2002;346:877-883.



Traditional implantable automatic cardioverter defibrillator



- Traditional implantable automatic cardioverter defibrillator includes a pulse generator and electrodes
- When ventricular tachycardia or fibrillation occurs, the defibrillator will switch on its function. Through increasing the speed of pace or emit electric shock, heart beat can resume normal
- A closefitting first-aid tools and primary prevention for sudden cardiac death

Identifying VT

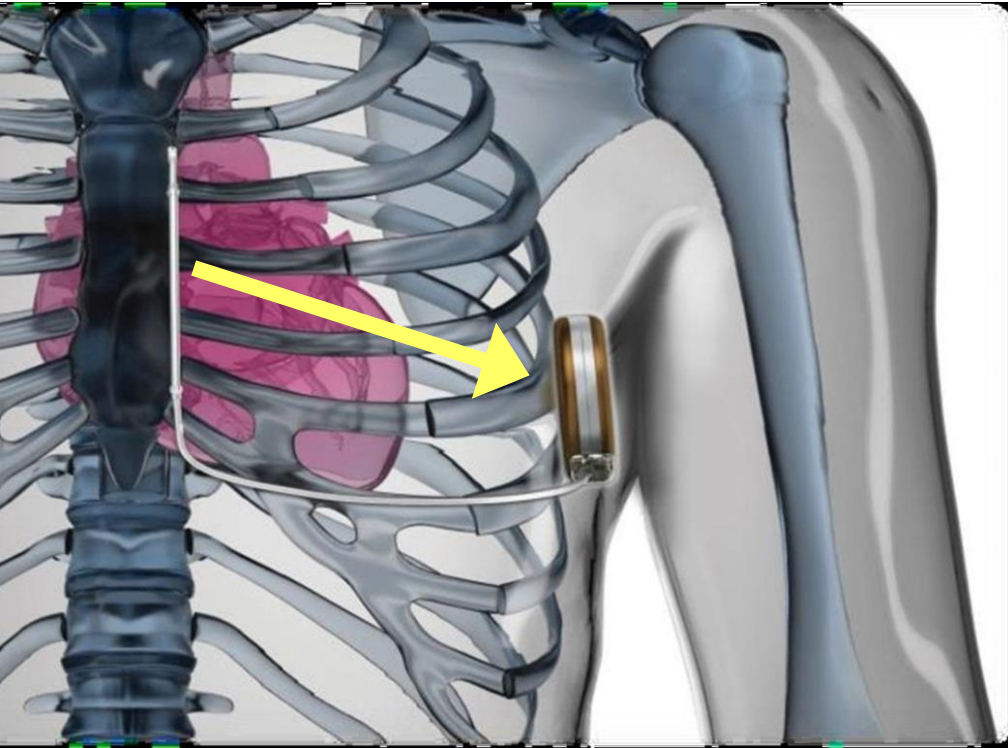
Confirming VT

Defibrillation





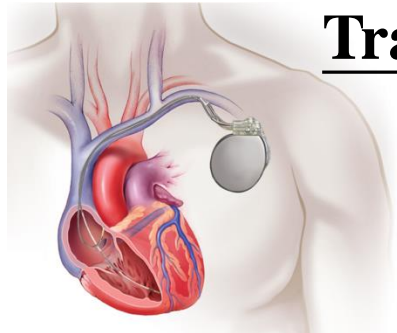
A newly developed subcutaneous implantable cardioverter defibrillator



- Completely subcutaneous and does not require leads in the heart
- Placed strictly by anatomical landmarks, removing the need for fluoroscopy at implant
- Sophisticated algorithms provide performance equal to, if not better than the traditional one
- 80 joule (delivered) biphasic shock
- Battery life around 5.1 year longevity

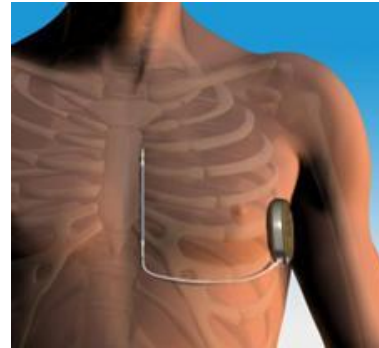


Comparison between traditional and newly developed cardioverter defibrillator



Traditional

- Device is implanted near the collarbone
- Using X-ray imaging, 1 or 2 electrical wires are fed through a vein into your heart, so there is a risk of complications, such as systemic infections and the need to remove or replace the leads in the heart
- Procedure time: 1.5 hour
- Provides pacing and Anti-tachycardia Pacing therapy

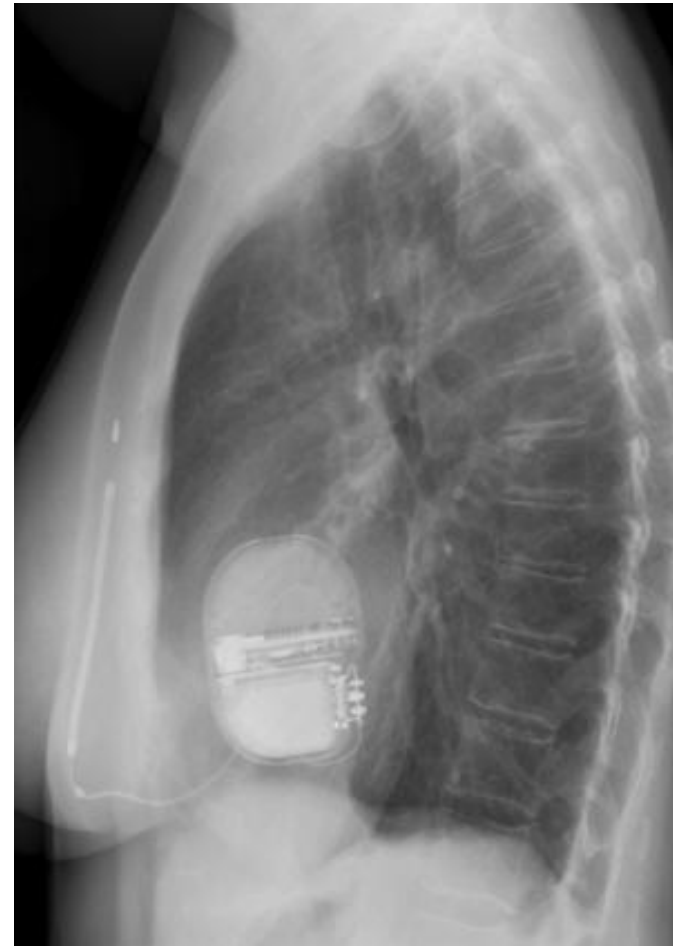


New

- Device is implanted on the left side of the chest next to the rib cage
- Electrode is implanted just under the skin above the breastbone so avoidance of typical complications, such as systemic infections and the need to remove or replace the leads in the heart
- Procedure time: around 1 hour
- Limited pacing function



Implantation Placement





Post-Operative Pictures



One day after surgery



One month after surgery





Patients who are suitable for the new device

- As there is no access to the venous system or ventricle, suitable for those with mechanical heart valves or complex congenital heart
- Patients at high risk of lead-related complications, e.g. active young patients, those with an existing indwelling catheter, immunocompromised patients, patients with prior device infection
- Patients with a low risk of recurrent VT or bradycardia, for example, inherited channelopathies, idiopathic VF, and hypertrophic cardiomyopathy



Conclusion

- A subcutaneous (under the skin) implantable cardioverter defibrillator
- Provides effective defibrillation for patients at risk of sudden cardiac death
- To reduce the number of complications associated with traditional implantable automatic cardioverter defibrillator, such as vascular injury, infection and lead fractures
- Avoids potential complications associated with endovascular lead implantation or extraction