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Synchronized Cardioversion

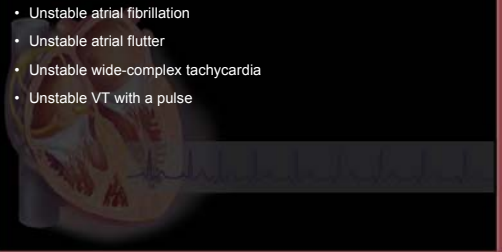


Synchronized Cardioversion

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Synchronized Cardioversion – Indications

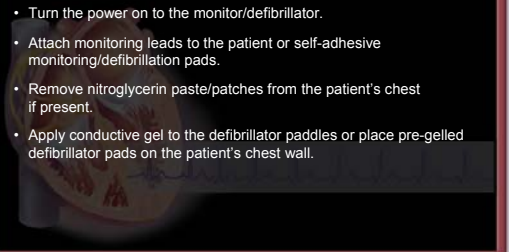
- Unstable supraventricular tachycardia
- Unstable atrial fibrillation
- Unstable atrial flutter
- Unstable wide-complex tachycardia
- Unstable VT with a pulse



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Synchronized Cardioversion - Procedure

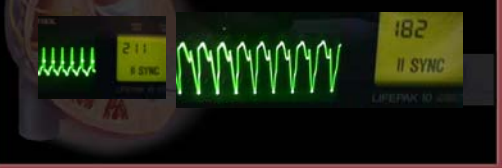
- If the patient is awake and time permits, administer sedation.
- Turn the power on to the monitor/defibrillator.
- Attach monitoring leads to the patient or self-adhesive monitoring/defibrillation pads.
- Remove nitroglycerin paste/patches from the patient's chest if present.
- Apply conductive gel to the defibrillator paddles or place pre-gelled defibrillator pads on the patient's chest wall.



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Synchronized Cardioversion – Procedure

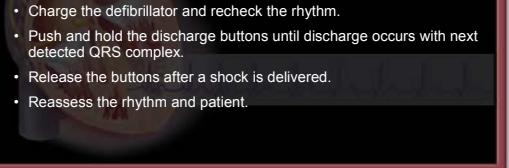
- Select a lead with optimum QRS complex amplitude (positive or negative).
- Press synchronizer control.
- Ensure machine "flagging" of QRS complexes.



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Synchronized Cardioversion - Procedure

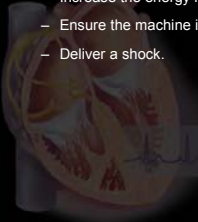
- Select the appropriate energy level for the clinical situation/rhythm.
- If using hand-held paddles, place the paddles on the patient's chest and apply firm pressure.
- LOOK (360 degrees) to be sure everyone is clear of the patient.
- Call "Clear!"
- Charge the defibrillator and recheck the rhythm.
- Push and hold the discharge buttons until discharge occurs with next detected QRS complex.
- Release the buttons after a shock is delivered.
- Reassess the rhythm and patient.



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Synchronized Countershock Procedure

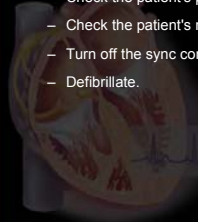
- If the tachycardia persists:
 - Increase the energy level per the appropriate algorithm.
 - Ensure the machine is in “sync” mode.
 - Deliver a shock.



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Synchronized Countershock Complications

- If VF occurs during the course of synchronization:
 - Check the patient's pulse.
 - Check the patient's rhythm.
 - Turn off the sync control.
 - Defibrillate.



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Electrical Therapy - Special Considerations

- Keep monitoring electrodes and wires away from the area for defibrillator pad / electrode placement.
 - Contact may cause arcing and patient skin burns.
- Remove excessive chest hair, if present.



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Electrical Therapy - Special Considerations

- Remove transdermal patches, bandages, or other materials from sites used for paddle placement.
- Do not discharge the defibrillator with the paddles pressed together or into the open air.



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Electrical Therapy - Special Considerations

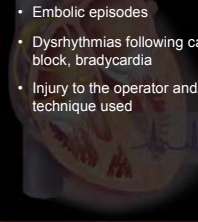
- Place the defibrillation paddles/electrodes at least 5 inches from a permanent pacemaker.
- Place the defibrillation paddles/electrodes at least 1 inch from an implantable cardioverter-defibrillator (ICD).



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Electrical Therapy - Possible Complications

- Skin burns
- Myocardial damage/dysfunction
- Embolic episodes
- Dysrhythmias following cardioversion including asystole, AV block, bradycardia
- Injury to the operator and/or team members if improper technique used



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Electrical Therapy - Possible Errors

- Operator unfamiliar with equipment
- Failure to properly maintain equipment
- Failure to remove transdermal patches, bandages, or other materials from site used for paddle placement
- Failure to confirm patient's hemodynamic status before performing electrical therapy
 - Treating the monitor, not the patient



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Electrical Therapy – Possible Errors

- In pulseless VT/VF, performing other procedures before defibrillation
- Improper paddle/electrode position
- Excessive use of conductive gel on the patient's chest or paddles
- Inappropriate energy level or type of countershock selected for dysrhythmia/clinical situation



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Electrical Therapy - Possible Errors

- Failure to "clear" self and team members before delivery of each shock
- Failure to assess for presence of a pulse with each rhythm change observed on the cardiac monitor
- Failure to assess a patient's vital signs upon return of a pulse



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Electrical Therapy - Summary

Type of Shock	Dysrhythmia	Energy Levels
Defibrillation	Pulseless VT/VF	200, 200-300, 360 J or equivalent biphasic energy
	Sustained polymorphic VT	200, 200-300, 360 J or equivalent biphasic energy
	Unstable VT with pulse	100, 200, 300, 360 J or equivalent biphasic energy
	Undue delay in delivery of sync shock	Dependent on rhythm



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Electrical Therapy – Summary

Type of Shock	Dysrhythmia	Energy Levels
Synchronized Cardioversion	PSVT	50, 100, 200, 300, 360 J or equivalent biphasic energy
	Atrial flutter	50, 100, 200, 300, 360 J or equivalent biphasic energy
	Atrial fibrillation	100, 200, 300, 360 J or equivalent biphasic energy
	VT with a pulse	100, 200, 300, 360 J or equivalent biphasic energy



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Implantable Cardioverter-Defibrillator (ICD)



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What Is an ICD?

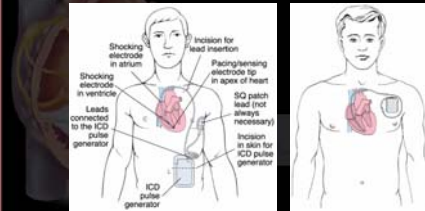
- An electronically programmed device capable of identifying and terminating dysrhythmias including VT and VF



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What is an ICD?

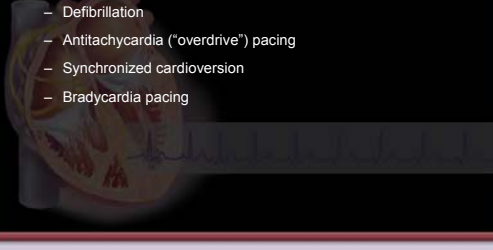
- Typically weighs about ½ pound
- Placed SC in the left upper quadrant of the abdomen or left pectoral region



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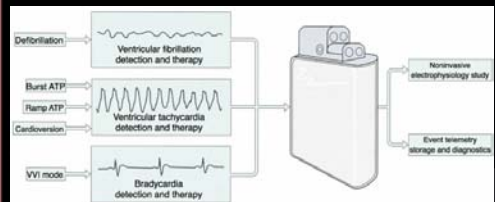
ICD – Therapies

- Depending on how the device is programmed and the rhythm detected, capable of:
 - Defibrillation
 - Antitachycardia ("overdrive") pacing
 - Synchronized cardioversion
 - Bradycardia pacing



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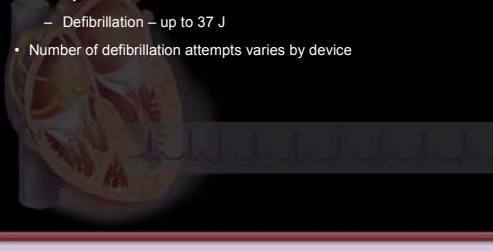
ICD – Therapies



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ICD - Therapies

- Energies for electrical therapy are programmable
 - Synchronized cardioversion - 0.1 to 37 J
 - Defibrillation – up to 37 J
- Number of defibrillation attempts varies by device



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External Electrical Therapy and the Patient with an ICD

- Treatment of the patient with an ICD is no different than treatment of patients without them.
- Do not place defibrillation paddles directly over ICD generator.

