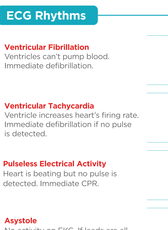
The Ultimate ACLS Study Guide

Advanced cardiac life support (ACLS) provides advanced guidelines and skills that prepare healthcare professionals for all types of cardiac emergencies.

EKG Anatomy

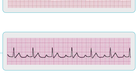


P-Wave – electrical activity in the upper heart chambers, represents contractions
PR Interval – beginning of atrial polarization to beginning of ventricular depolarization
QRS Complex – electrical activity in the lower heart chambers, includes the Q wave (first downstroke), R wave (first upward deflection), and S wave (first downward deflection)
T-Wave – relaxation of upper heart

SureFire CPR

ECG Rhythms

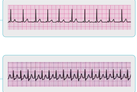
Ventricular Fibrillation
Ventricles can't pump blood. Immediate defibrillation.



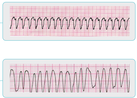
Ventricular Tachycardia
Ventricle increases heart's firing rate. Immediate defibrillation if no pulse is detected.

Pulseless Electrical Activity
Heart is beating but no pulse is detected. Immediate CPR.

Asystole
No activity on EKG. If leads are all connected, begin CPR immediately.



Sinus Bradycardia
Heart rate is less than 60 beats/minute. Pharmacology if symptomatic.



1st Degree AV Block
Prolonged P-R interval. Rarely requires treatment.

2nd Degree Block (Type I - Wenckebach)
Even longer P-R intervals lead to dropped QRS complexes. Rarely requires treatment.

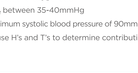
2nd Degree Block (Type II - Mobitz)
Dropped QRS complexes and no ventricular contractions. Usually requires transcutaneous pacing.

3rd Degree Block
No communication between SA and AV nodes. Oxygen, pharmacology, and transcutaneous pacing.

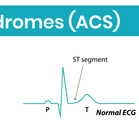
Sinus Tachycardia
Increased heart rate of 101-150 beats per minute. Typically caused by external factors.

Supraventricular Tachycardia
Indistinguishable P waves run into T waves with a narrow QRS complex. Vagal maneuvers or pharmacology for stable patients. Immediate cardioversion for unstable patients.

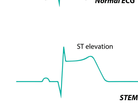
Monomorphic Ventricular Tachycardia
QRS complexes are all the same size. Pharmacology for stable patients. Immediate cardioversion for unstable patients.



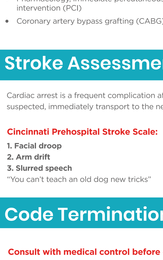
Polymorphic Ventricular Tachycardia (with pulses)
QRS complexes are different shapes and sizes. Immediate defibrillation and CPR.



Torsades de Pointes
Different sizes of QRS complexes form a twisting pattern. Suspect low potassium or quinidine deficiency - treat with magnesium.



Electrical Therapy Basics



Defibrillation
Uses an automated external defibrillator (AED)

Synchronized Cardioversion
Shock synchronized to specific point on the QRS complex

Transcutaneous Pacing
Treats abnormally slow heart rate

SureFire CPR

Airway Management

Adjuncts

- **Oropharyngeal (OP) airway -** use for unconscious patients with no gag reflex
- **Nasopharyngeal (NP) airway -** use for semi-conscious patients, NEVER USE WITH A HEAD INJURY

Advanced Airways

- **Endotracheal tube -** recommended method, use with continuous waveform capnography
- **Laryngeal mask airway (LMA) -** use if unfamiliar with endotracheal tube

Post-Resuscitation Care

Follow the ABCDs:

- **Airway -** optimize ventilation and oxygenation
- **Breathing -** keep $PETCO_2$ between 35-40mmHg
- **Circulation -** aim for a minimum systolic blood pressure of 90mmHg
- **Differential Diagnosis -** use H's and T's to determine contributing factors of cardiac arrest

Acute Coronary Syndromes (ACS)

Unstable Angina

- Unexpected chest pain due to poor blood flow through coronary arteries
- Blood thinners
- Angioplasty to open a narrow or blocked artery

ST-Segment Elevation MI (STEMI)

- Total blockage of a coronary artery
- Electrical activity during the ST-segment shows ventricular muscle death
- Pharmacology with immediate percutaneous coronary intervention (PCI)
- Coronary artery bypass grafting (CABG) surgery

Non-ST-Segment Elevation MI (NSTEMI)

- Partial blockage of a coronary artery
- ST-segment depressed instead of elevated, no progression to Q wave
- Pharmacology, immediate percutaneous coronary intervention (PCI)
- Coronary artery bypass grafting (CABG) surgery

SureFire CPR

Stroke Assessment and Treatment

Cardiac arrest is a frequent complication after an acute ischemic stroke. If a stroke is suspected, immediately transport to the nearest Stroke Receiving Center.

Cincinnati Prehospital Stroke Scale:

1. Facial droop
2. Arm drift
3. Slurred speech
"You can't teach an old dog new tricks"

Code Termination

Consult with medical control before code termination.

- Persistent asystole 25 minutes or longer
- Obvious signs of death, withhold resuscitation efforts

SureFire CPR