



THE UNIVERSITY OF TOLEDO
MEDICAL CENTER

Basic Cardiac Rhythms – Identification and Response



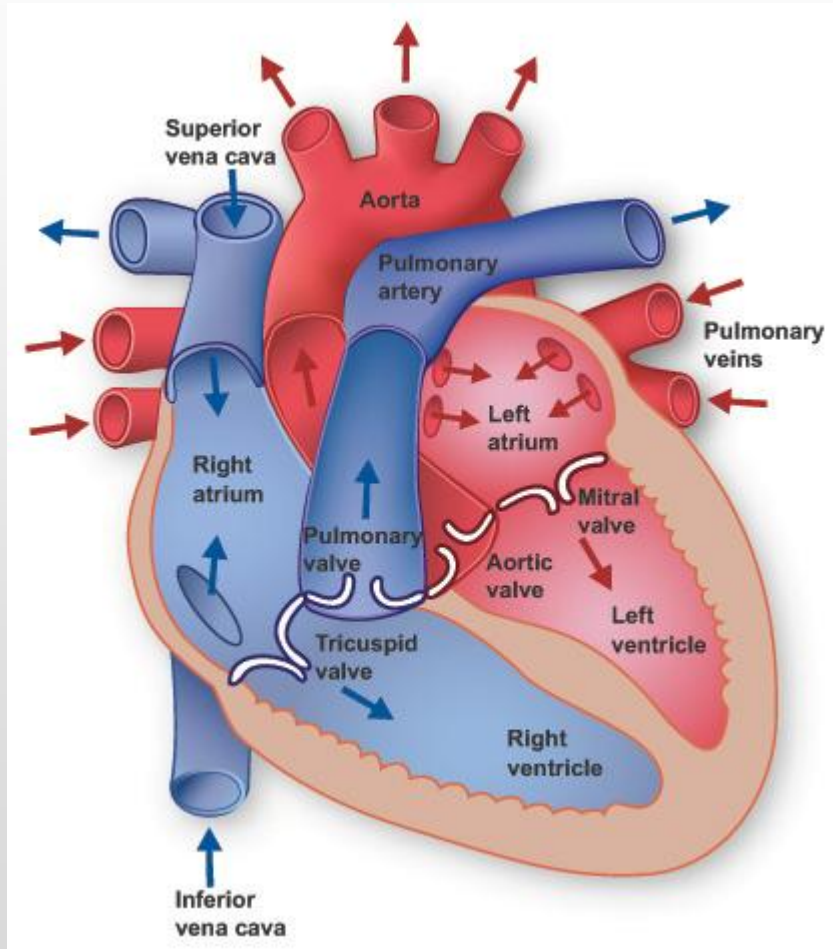
Module 1

ANATOMY, PHYSIOLOGY, & ELECTRICAL CONDUCTION

Objectives

- Describe the normal cardiac anatomy and physiology and normal electrical conduction through the heart.
- Identify and relate waveforms to the cardiac cycle.

Cardiac Anatomy



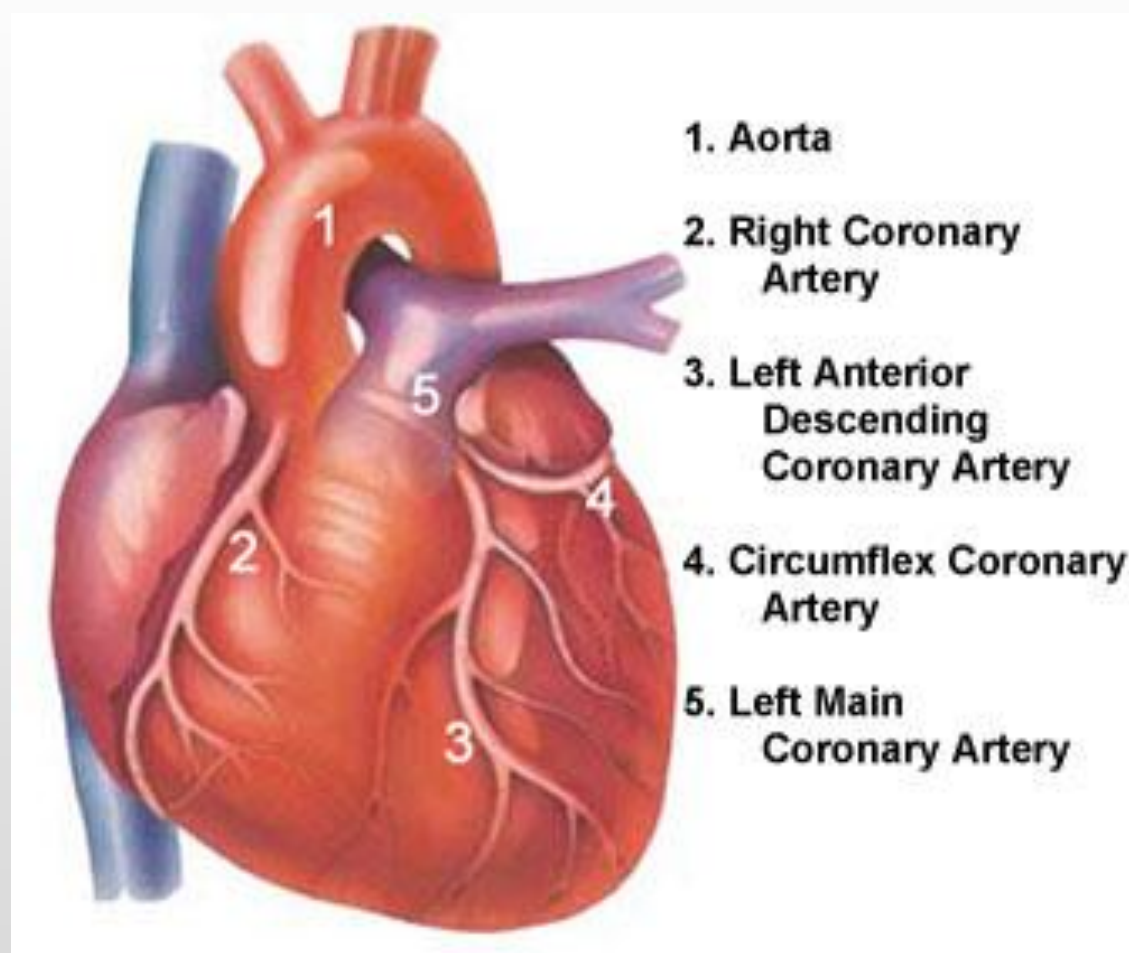
- 2 upper chambers
 - Right and left atria
- 2 lower chambers
 - Right and left ventricle
- 2 Atrioventricular valves (Mitral & Tricuspid)
 - Open with ventricular diastole
 - Close with ventricular systole
- 2 Semilunar Valves (Aortic & Pulmonic)
 - Open with ventricular systole
 - Open with ventricular diastole

The Cardiovascular System

- **Pulmonary Circulation**
 - Unxygenated – right side of the heart

- **Systemic Circulation**
 - Oxygenated – left side of the heart

Anatomy Coronary Arteries



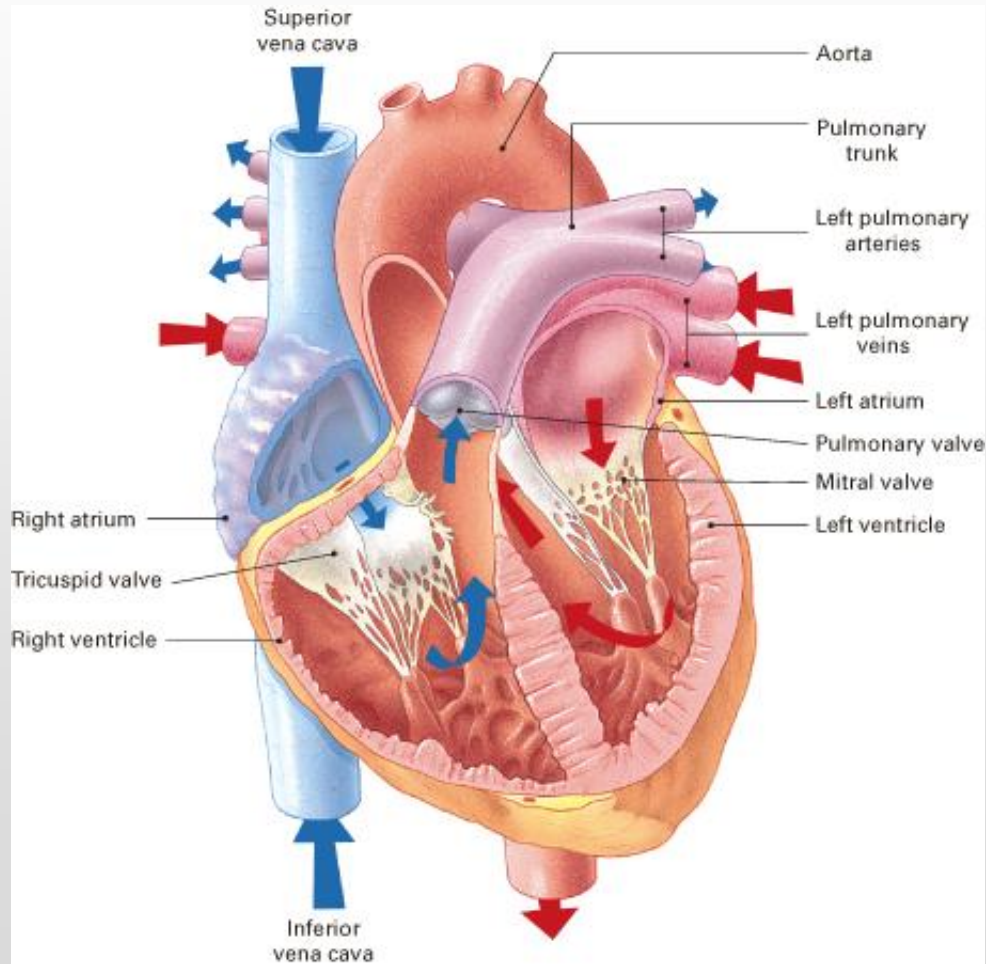
[How The Heart Works](#)

Anatomy

Coronary Arteries

- **2 major vessels of the coronary circulation**
 - **Left main coronary artery**
 - **Left anterior descending and circumflex branches**
 - **Right main coronary artery**
- **The left and right coronary arteries originate at the base of the aorta from openings called the coronary ostia behind the aortic valve leaflets.**

Physiology Blood Flow



Unoxygenated blood flows from
inferior and superior vena cava

↓
Right Atrium

↓
Tricuspid Valve

↓
Right Ventricle

↓
Pulmonic Valve

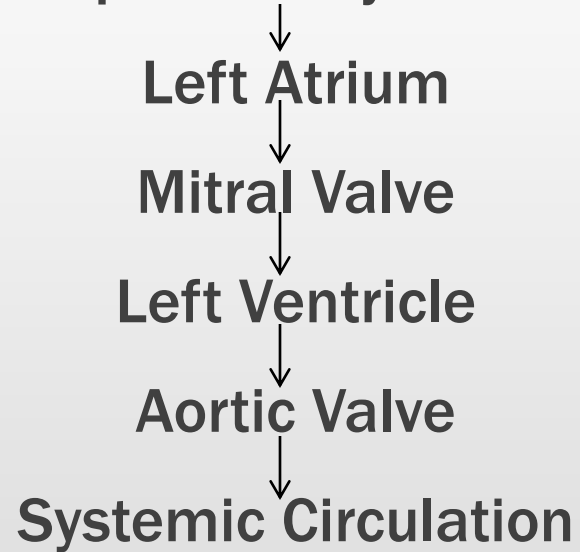
↓
Lungs

↓
Through Pulmonary system

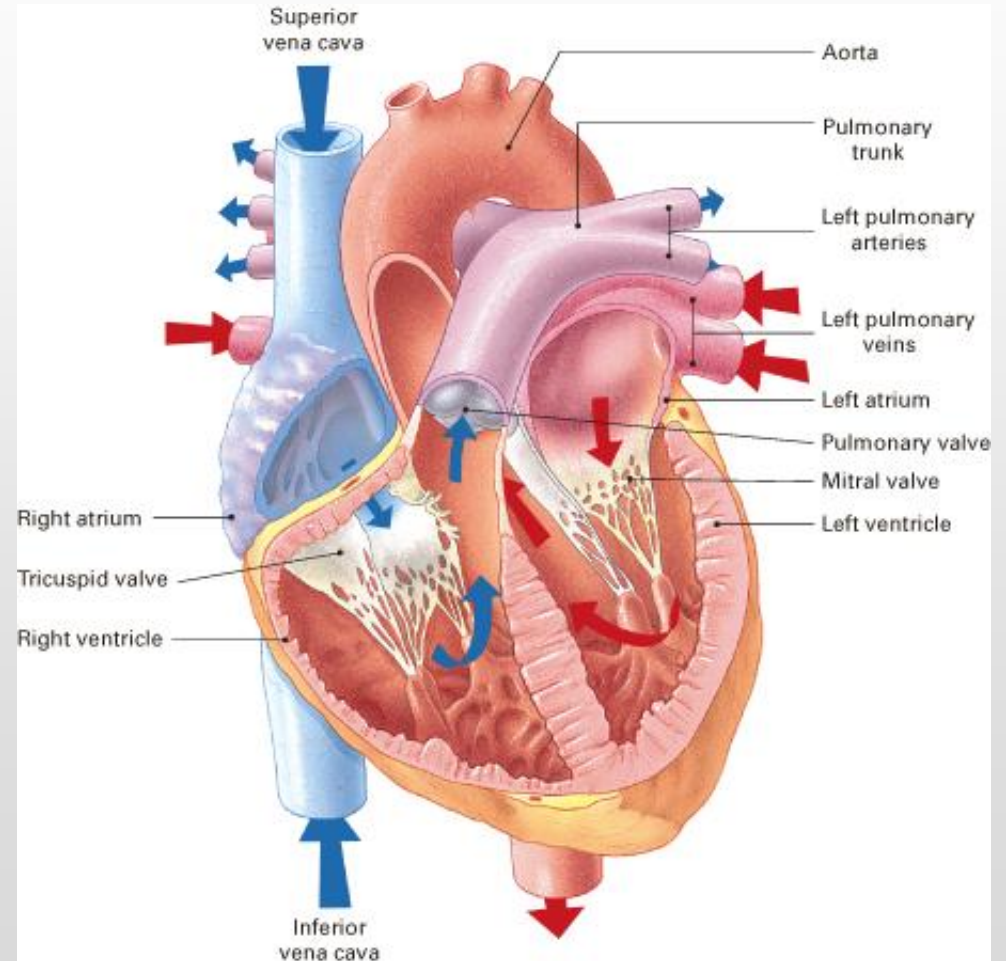
Physiology

Blood Flow

Oxygenated blood flows from the pulmonary veins



- [Blood Flow Through The Heart](#)
- [Cardiology Rap](#)



Physiology

- **Cardiac cycle**
 - Represents the actual time sequence between ventricular contraction and ventricular relaxation
- **Systole**
 - Simultaneous contraction of the ventricles
- **Diastole**
 - Synonymous with ventricular relaxation
 - When ventricles fill passively from the atria to 70% of blood capacity

Physiology

- **Heart rate (HR)**
 - Number of contractions (beats per minute)
 - Normal heart rate is 60 – 100 beats per minute (bpm)

- **Stroke volume (SV)**
 - Volume of blood being pumped out of ventricles in a **single beat or contraction**
 - Normal stroke volume is 60 – 130 mL

Physiology

- Cardiac output (CO)
 - Amount of blood pumped by the left ventricle in **one minute**
 - Normal cardiac output is 4 – 8 L/min

Cardiac Output =

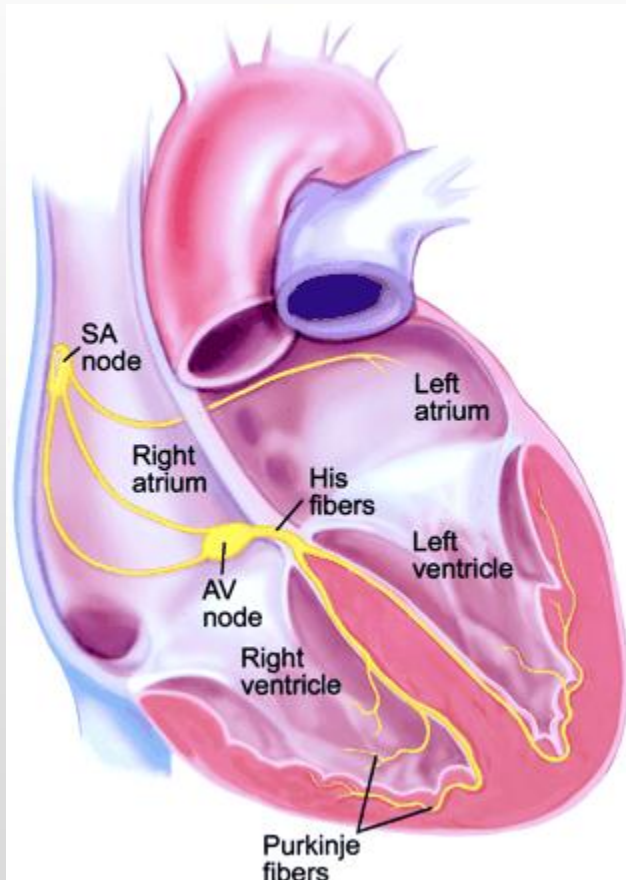
Stroke Volume x Heart Rate

****Our Swan boxes give us a continuous cardiac output reading!**

Physiology

- **Pre-load**
 - Volume and stretch of the ventricular myocardium at the end of diastole
- **After-load**
 - Amount of pressure against which the left ventricle must work during systole to open the aortic valve
 - Clinically measure by systolic blood pressure

Normal Electrical Conduction System



- SA node
- Inter-nodal pathways
- AV node
- Bundle of his
- Left & Right bundle branches
- Purkinje fibers

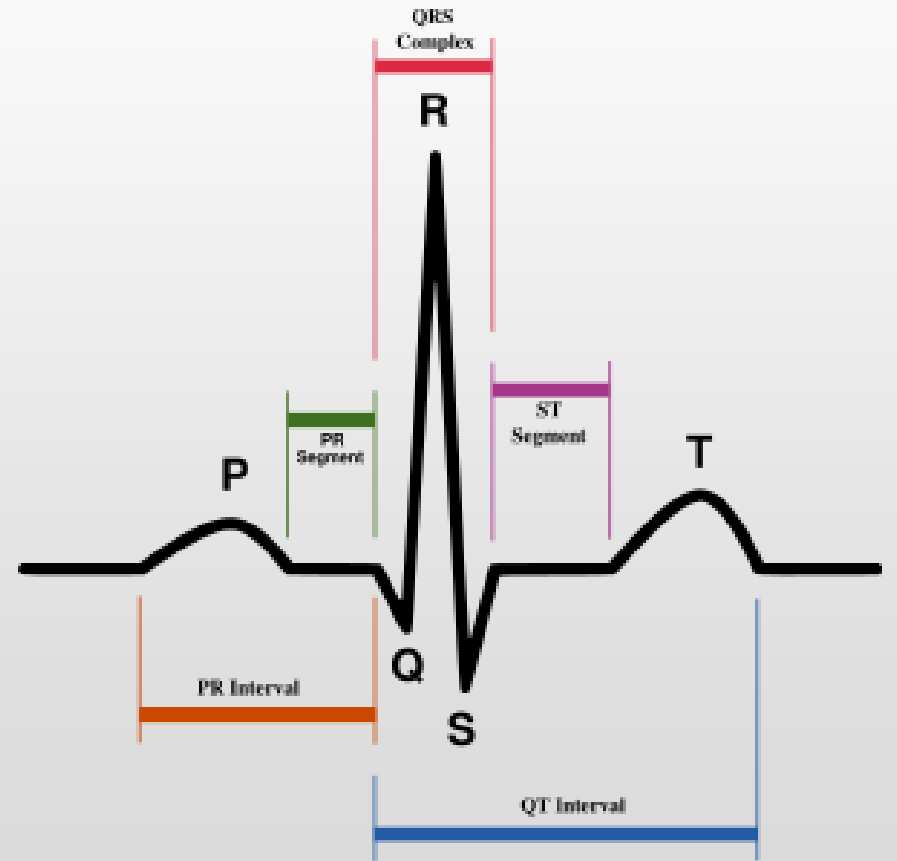
[The SA Node and the AV Node](#)

Electrical Conduction System

EKG Waveforms

One complete cardiac cycle =

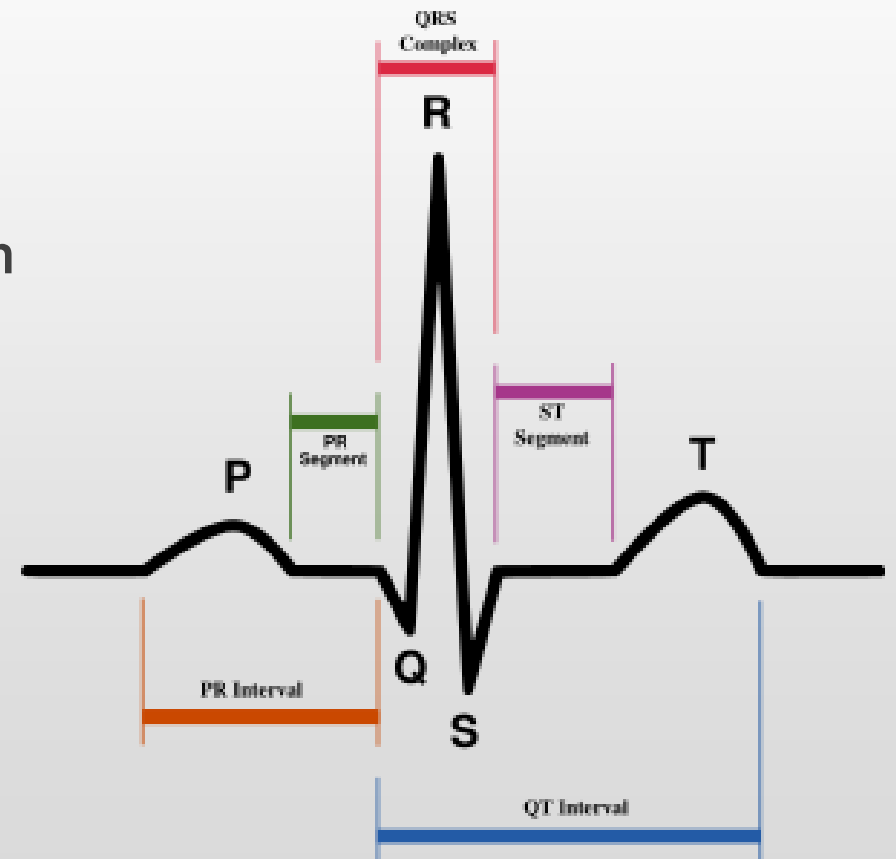
P, Q, R, S, (QRS complex),
and T wave



Electrical Conduction System

EKG Waveforms

- P wave
 - Atrial depolarization (contraction)
- QRS Complex
 - Ventricular depolarization, atrial repolarization
- T wave
 - Ventricular repolarization (resting phase)



Module 2

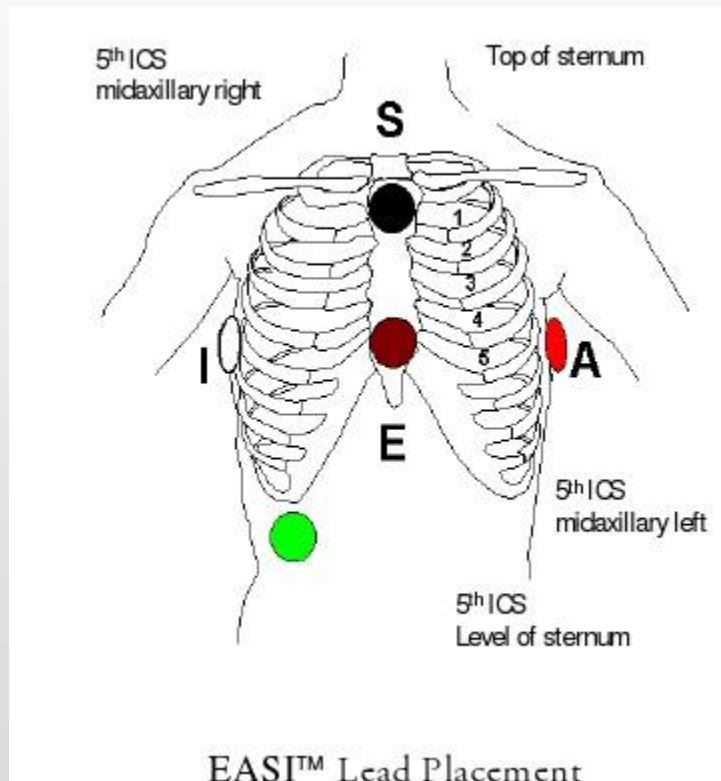
INTERPRETING EKG RHYTHM STRIPS

Objectives

- Utilize a systematic process when approaching the interpretation of the EKG.
- Identify normal and abnormal components on the EKG.

EASI Lead

Lead Placement



Color Code

E Brown: Lower sternum (5th intercostal space)

A Red: Left mid-axillary line (5th intercostal space)

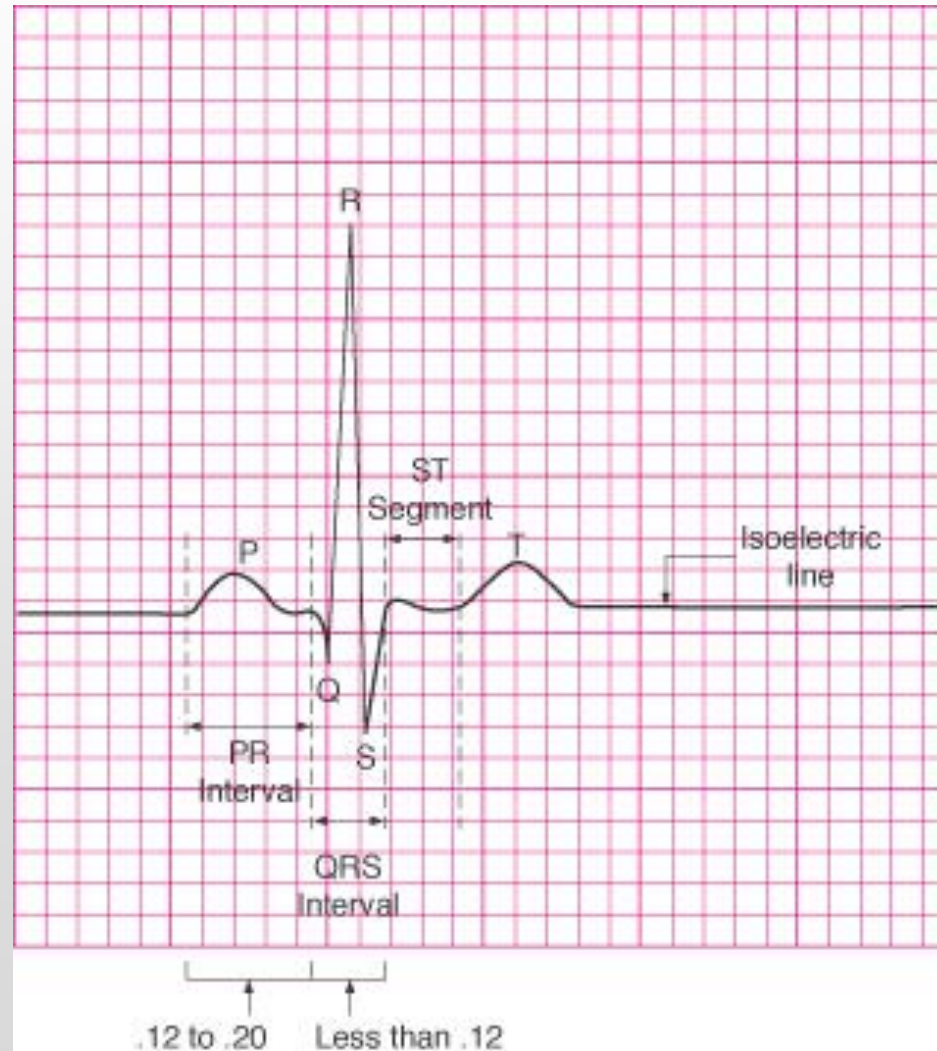
S Black: Upper sternum (just below sternal angle)

I White: Right mid-axillary line (5th intercostal space)

Green: Anywhere

Electrical Conduction Systems

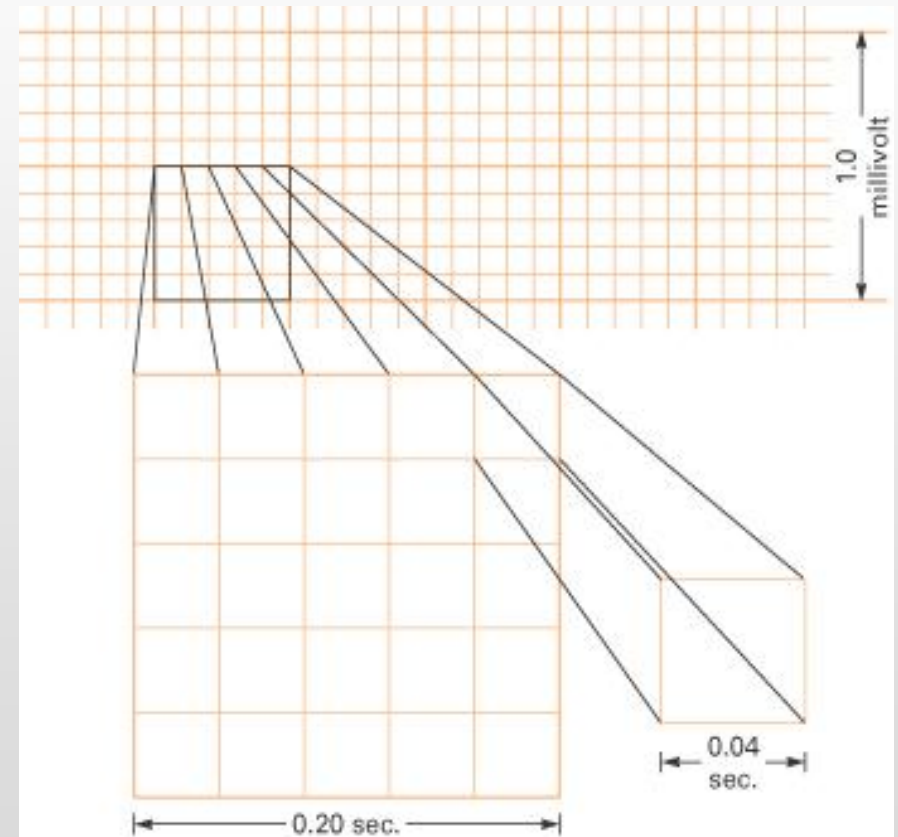
EKG Waveforms



Reading EKG Graph Paper

Graph paper allows a visual measurement of:

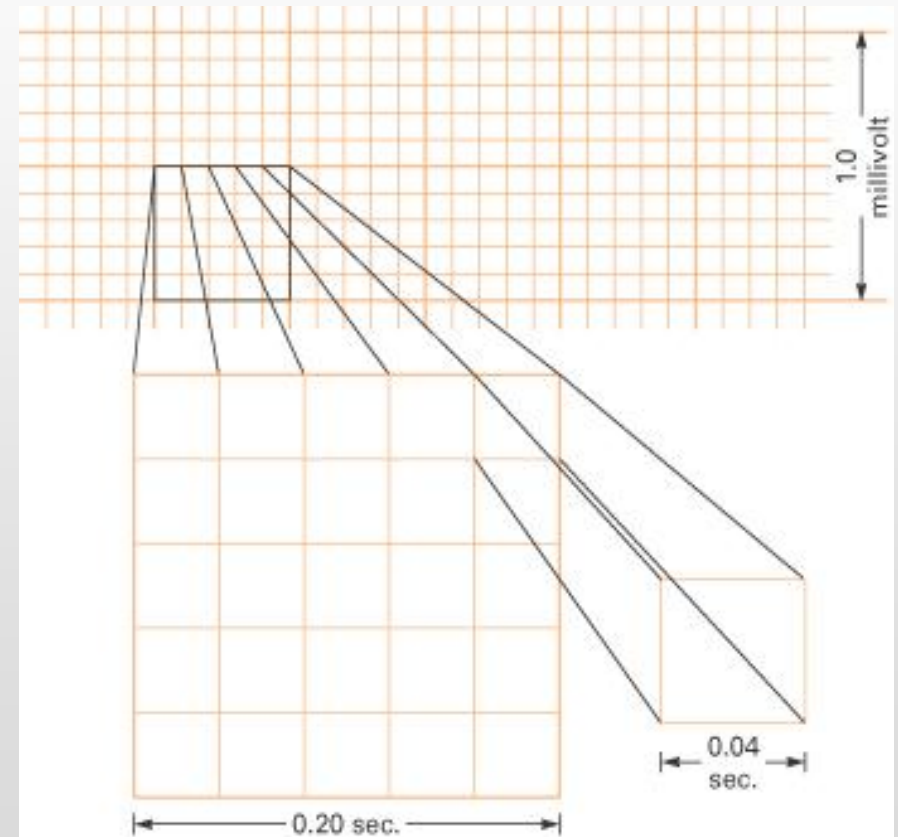
- Time (rate)
 - Measured on the horizontal line
- Amplitude (voltage)
 - Measured on the vertical line



Reading EKG Graph Paper

Paper divided into small squares:

- Width = **1 millimeter (mm)**
- Time interval = **0.04 seconds**
- **1 small square = 0.04 seconds**



Interpreting EKG Rhythm Strips

- First and most important
 - **ASSESS YOUR PATIENT!!**
- Read every strip from left to right, starting at the beginning of the strip
- Apply the five-step systematic approach that you will learn in this module for consistency with each strip that you interpret

Interpreting EKG Rhythm Strips

The Five Step Approach

The five-step approach, in order of application, includes analysis of the following:

1. Heart rate
2. Heart rhythm
3. P wave
4. PR interval
5. QRS complex

Interpreting EKG Rhythm Strips

Step 1 – Heart Rate

- Count the number of electrical impulses as represented by PQRST complexes conducted through the myocardium in 60 seconds (1 minute)
- **Atrial rate:** Count the number of P waves
- **Ventricular rate:** Count the number of QRS complexes

Interpreting EKG Rhythm Strips

Step 1 – Heart Rate

Methods to determine heart rate

- The 6 second method

- Denotes a 6 second interval on EKG strip
- Strip is marked by 3 or 6 second tick marks on the top or bottom of the graph paper
- Count the number of QRS complexes occurring within the 6 second interval, and then multiply that number by 10

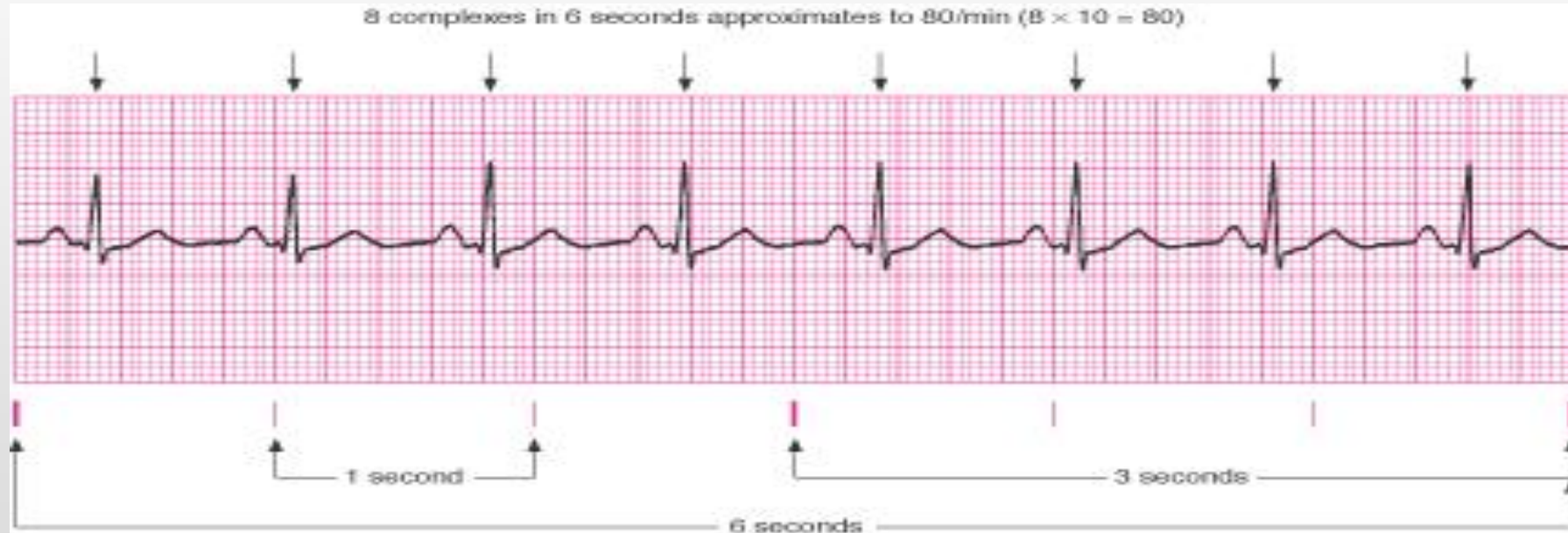
- Using rate determination chart

- More accurate calculation of HR
- Preferred method
- **Must use this method for the test!!**

Interpreting EKG Rhythm Strips

Step 1 – Heart Rate

- 6 second method



Interpreting EKG Rhythm Strips

Step 1 – Heart Rate

- Using rate determination chart

EKG RATE DETERMINATION CHART

<u>Spaces</u>	<u>Rate</u>	<u>Spaces</u>	<u>Rate</u>	<u>Spaces</u>	<u>Rate</u>	<u>Spaces</u>	<u>Rate</u>
3	500	12.5	120	22	68	32	47
3.5	428	13	115	23	65	32.5	46
4	374	13.5	111	23.5	63	33	45
4.5	334	14	107	24	62	34	44
5	300	15	100	24.5	61	35	43
5.5	273	15.5	97	25	60	36	42
6	250	16	94	25.5	59	37	41
7	214	16.5	91	26	58	37.5	40
7.5	200	17	88	26.5	57	38	39
8	188	17.5	86	27	56	39	38
8.5	176	18	83	27.5	55	40	37
9	167	18.5	81	28	54	42	36
9.5	158	19	79	28.5	53	43	35
10	150	19.5	77	29	52	44	34
10.5	143	20	75	29.5	51	46	33
11	136	20.5	73	30	50	47	32
11.5	130	21	71	30.5	49	48	31
12	125	21.5	70	31	48	50	30

- Count spaces between R to R
- Find number of spaces on the chart to determine the rate

Interpreting EKG Rhythm Strips

Step 1 – Heart Rate

- Example:

1. Find an R to R

2. Count the small boxes between the R's = 15

3. On the chart find "15 spaces" = 100bpm



Interpreting EKG Rhythm Strips

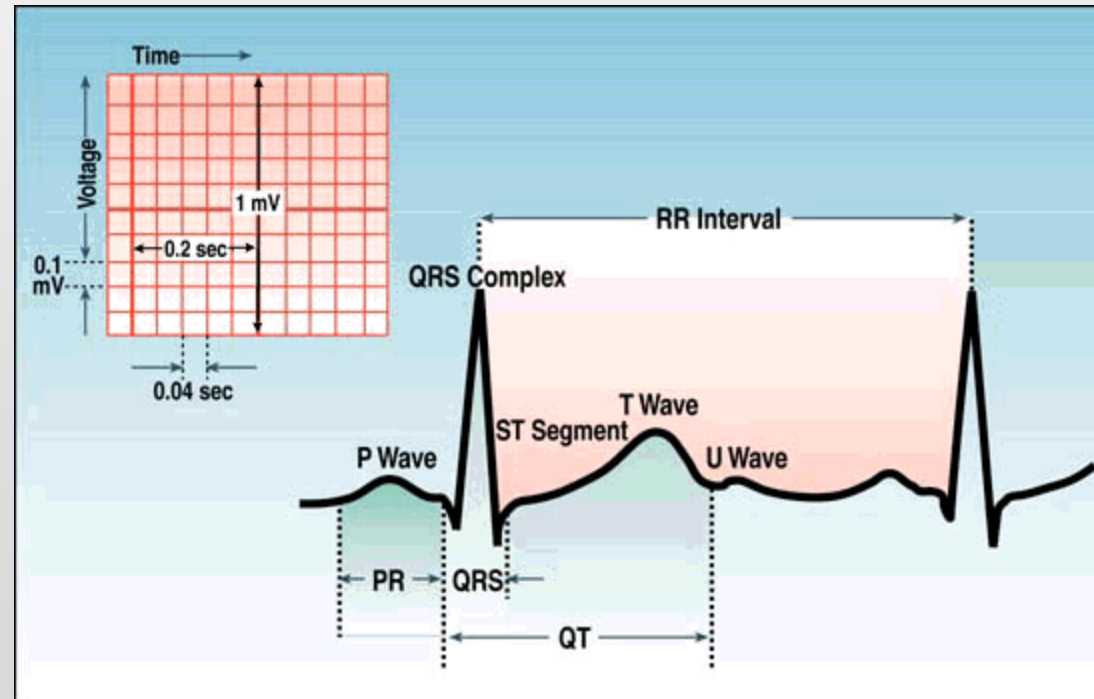
Step 2 – Rhythm

- Rhythm
 - A sequential beating of the heart as a result of the generation of electrical impulses
 - Classified as:
 - **Regular pattern:** Interval between the R waves is regular
 - **Irregular pattern:** Interval between the R waves is not regular

Interpreting EKG Rhythm Strips

Step 2 – Rhythm

- Measuring a Regular Rhythm
 - Measure the intervals between R waves (measure from R to R)
 - If the intervals vary by less than 0.06 seconds or 1.5 small boxes, the rhythm is considered to be regular



Interpreting EKG Rhythm Strips

Step 2 – Rhythm

- Measuring an Irregular Rhythm
 - If the intervals between the R waves (from R to R) are variable by greater than 0.06 seconds or 1.5 small boxes, the rhythm is considered to be irregular

Interpreting EKG Rhythm Strips

Step 3 – P Wave

- P wave is produced when the left and right atria depolarize
 - First deviation from the isoelectric line
 - Should be rounded and upright
 - P wave is the SA node pacing or firing at regular intervals
 - This pattern is referred to as a sinus rhythm



Interpreting EKG Rhythm Strips

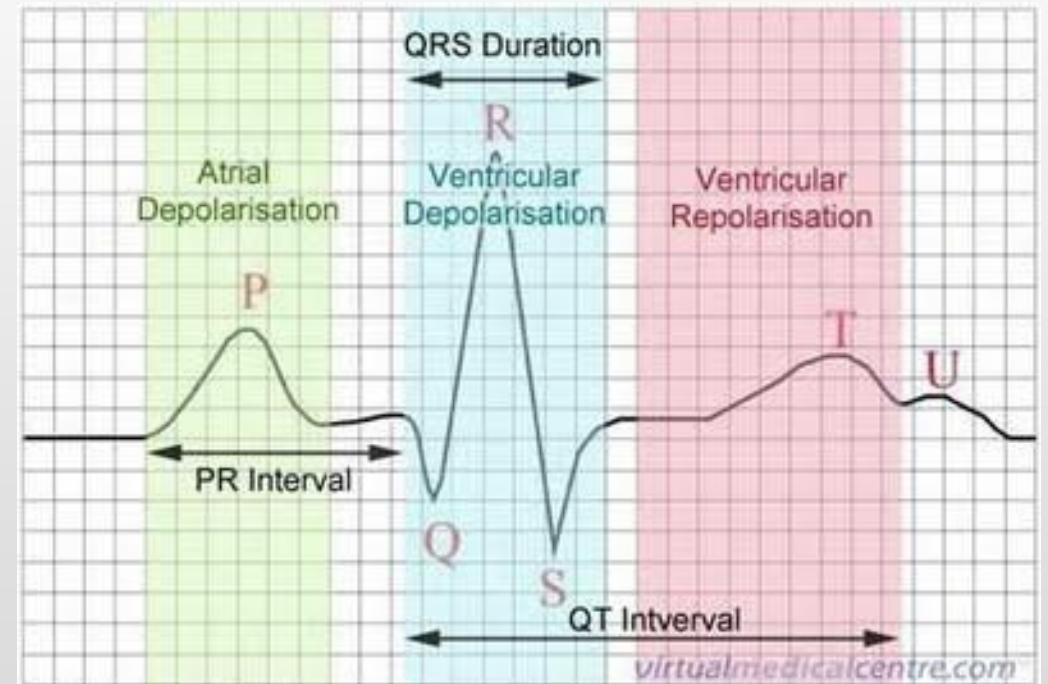
Step 3 – P Wave

- P wave: 5 questions to ask
 1. Are P waves present?
 2. Are P waves occurring regularly?
 3. Is there one P wave present for every QRS complex present?
 4. Are the P waves smooth, rounded, and upright in appearance, or are they inverted?
 5. Do all P waves look similar?

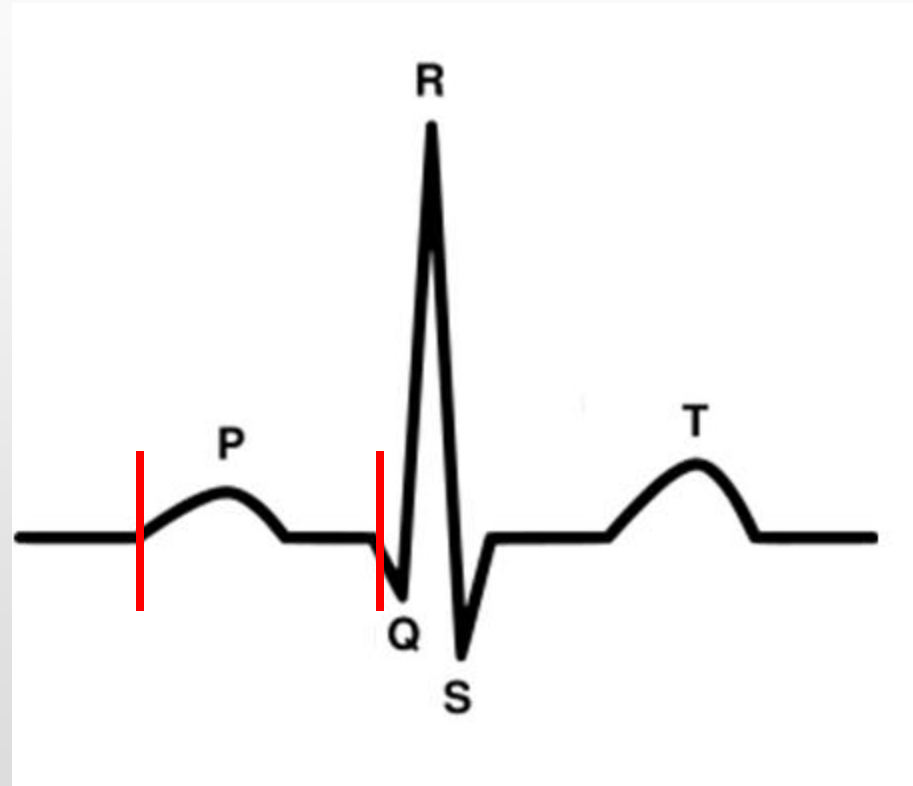
Interpreting EKG Rhythm Strips

Step 4 – PR Interval

- Measures the time interval from the onset of atrial contraction to onset of ventricular contraction
- Measured from onset of P wave to the onset of the QRS complex
- Normal interval is 0.12–0.20 seconds (3-5 small squares)



Measuring PR Interval:



Red lines indicate where calipers would be placed to measure PR interval

Interpreting EKG Rhythm Strips

Step 4 – PR Interval

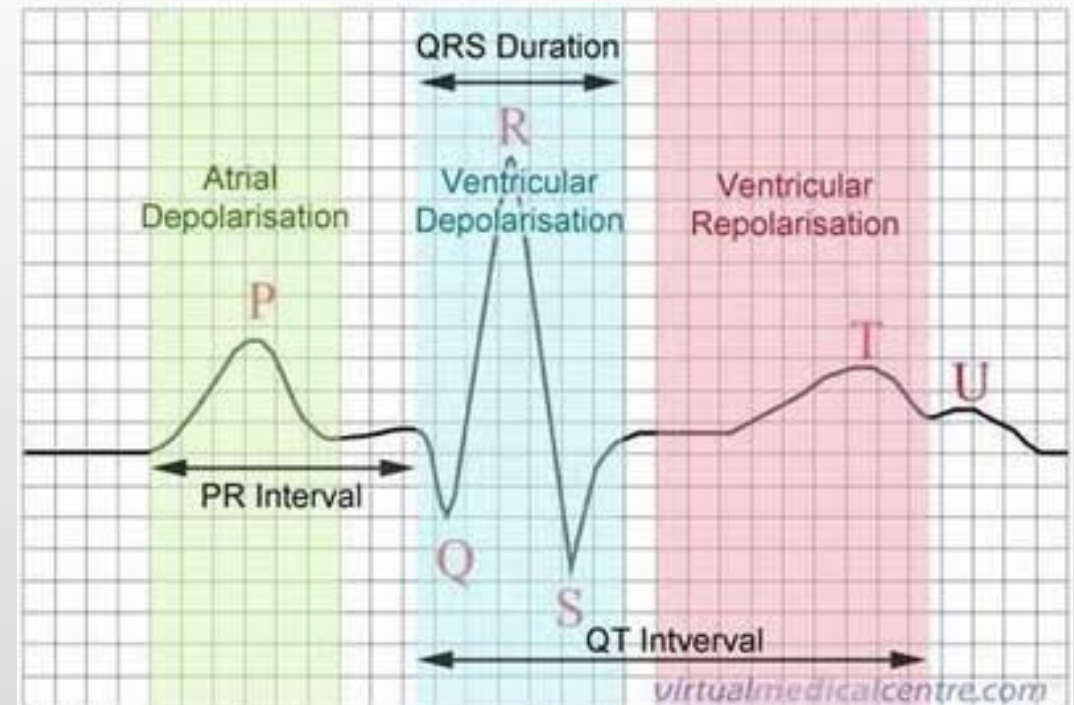
- PR interval: 3 questions to ask
 1. Are the PR intervals greater than 0.20 seconds?
 2. Are the PR intervals less than 0.12 seconds?
 3. Are the PR intervals consistent across the EKG strip?

Interpreting EKG Rhythm Strips

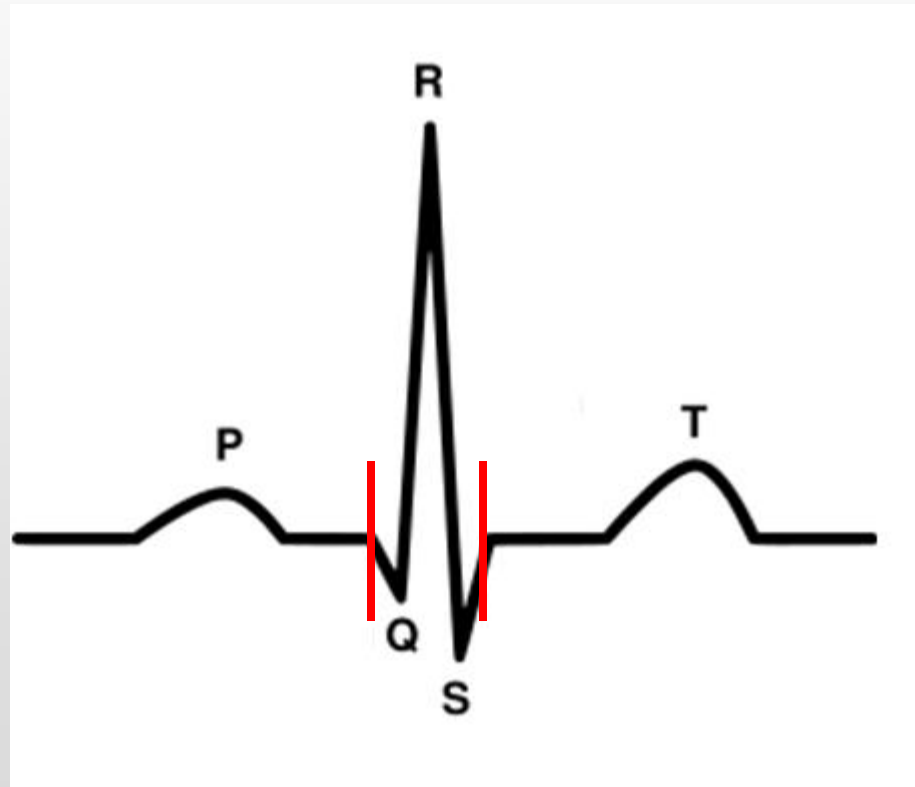
Step 5 – QRS Complex

- The QRS complex presents depolarization or contraction of the ventricles
 - Q wave
 - First negative or downward deflection of this large complex
 - R wave
 - First upward or positive deflection following the P wave (tallest waveform)
 - S wave
 - The sharp, negative or downward deflection that follows the R wave

- Normal interval is 0.06-0.12 seconds (1 ½ to 3 small boxes)



Measuring QRS complex:



Red lines indicate where calipers should be placed to measure QRS

Interpreting EKG Rhythm Strips

Step 5 – QRS Complex

- **QRS complex: 3 questions to ask**
 1. Are the QRS complexes greater than 0.12 seconds (in width)?
 2. Are the QRS complexes less than 0.06 seconds (in width)?
 3. Are the QRS complexes similar in appearance across the EKG strip?

Interpreting EKG Rhythm Strips

Practice Strip

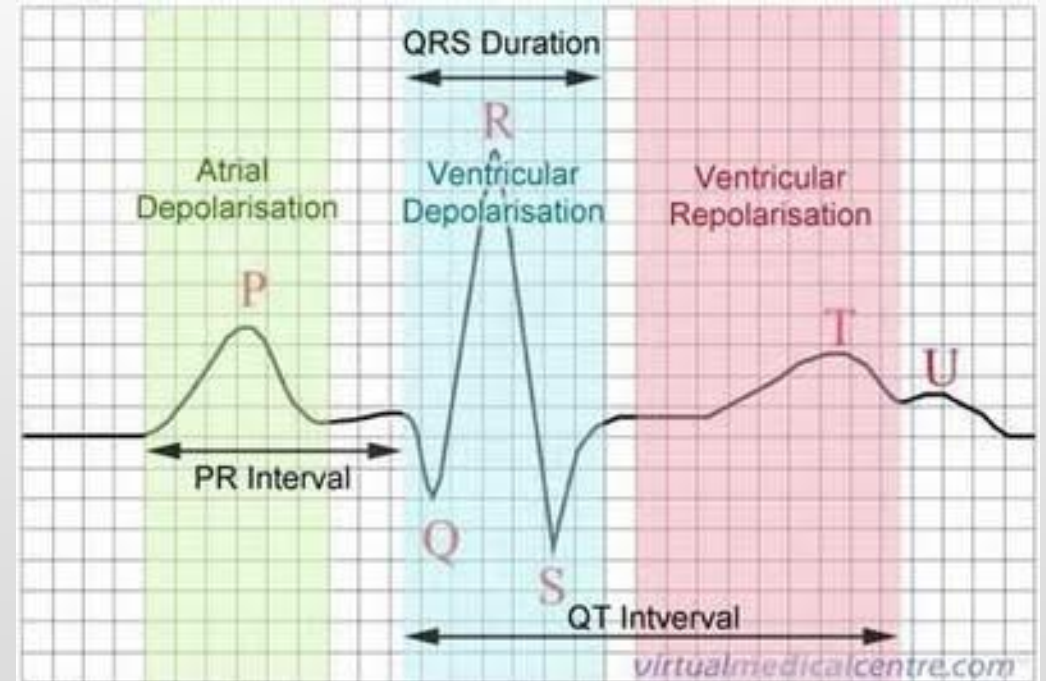


1. **HR = # of boxes between R's = 19 spaces = 79bpm**
2. **Rhythm = regular or irregular = regular (R-R's are equal)**
3. **P waves = P wave for every QRS? = yes**
4. **PR interval = measure from beginning of P to beginning of QRS = 0.16**
5. **QRS = measure from start of Q to end of S = 0.08**

Interpreting EKG Rhythm Strips

T Wave

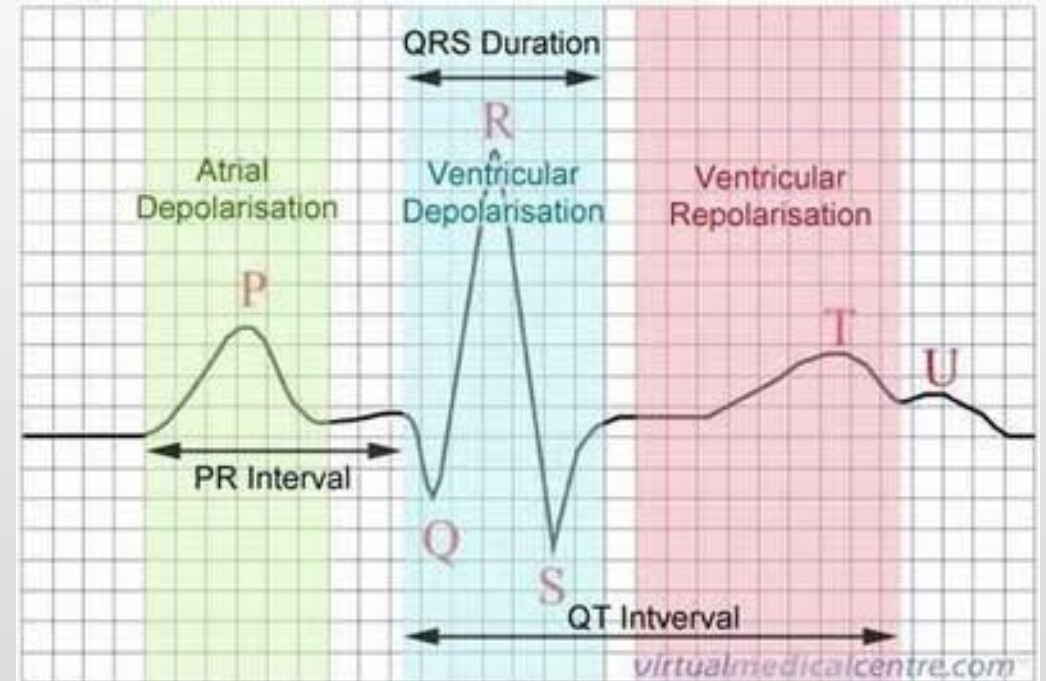
- Produced by ventricular repolarization or relaxation
- Commonly seen as the first upward or positive deflection following the QRS complex



Interpreting EKG Rhythm Strips

U Wave

- Usually not visible on EKG strips
- If visible, typically follows the T wave
- Appears much smaller than T wave, rounded, upright, or positive deflection if they are present
- Cause or origin not completely understood
- May indicate hypokalemia



Interpreting EKG Rhythm Strips

Artifact

- EKG waveforms from sources outside the heart
- Interference is seen on the monitor or EKG strip
- 4 causes
 - Patient movement (most common)
 - Loose or defective electrodes (fuzzy baseline)
 - Improper grounding (60 cycle interference)
 - Faulty EKG apparatus



Module 3

SINUS RHYTHMS

Objectives

- Recognize sinus dysrhythmias on EKG and relate cause, significance, symptoms, and treatment.

Sinus Rhythms

- ♥ Rhythms that originate in the sinoatrial node (SA node)
- ♥ 5 Common Variations of a sinus rhythm:
 - Normal sinus rhythm (60 – 100 bpm)
 - Sinus bradycardia (< 60 bpm)
 - Sinus tachycardia (>100 bpm)
 - Sinus arrhythmia (60 – 100 bpm)
 - Sinus pause/arrest

Normal Sinus Rhythm

Sinus rhythm is the normal regular rhythm of the heart set by the natural pacemaker of the heart called the sinoatrial node. It is located in the wall of the right atrium. Normal cardiac impulses start there and are transmitted to the atria and down to the ventricles.



5 Steps to Identify Normal Sinus Rhythm

1. What is the rate?	60-100 beats per minute
2. What is the rhythm?	Atrial rhythm regular Ventricular rhythm regular
3. Is there a P wave before each QRS? Are P waves upright and uniform?	Yes Yes
4. What is the length of the PR interval?	0.12-0.20 seconds (3-5 small squares)
5. Do all QRS complexes look alike? What is the length of the QRS complexes?	Yes 0.06-0.12 seconds (1 ½ to 3 small squares)

Normal Sinus Rhythm Nursing Interventions

- **No interventions required!! Monitor patient if ordered by physician.**

Sinus Bradycardia

Sinus bradycardia is a regular but unusually slow heart beat (less than 60 bpm). Sinus bradycardia is often seen as a normal variation in athletes, during sleep, or in response to a vagal maneuver.



5 Steps to Identify Sinus Bradycardia Rhythm

1. What is the rate?	Less than 60 beats per minute
2. What is the rhythm?	Atrial rhythm regular Ventricular rhythm regular
3. Is there a P wave before each QRS? Are P waves upright and uniform?	Yes Yes
4. What is the length of the PR interval?	0.12-0.20 seconds (3-5 small squares)
5. Do all QRS complexes look alike? What is the length of the QRS complexes?	Yes 0.06-0.12 seconds (1 ½ to 3 small squares)

Causes and S/S of Sinus Bradycardia

Causes

- Hypoglycemia
- Hypothermia
- Hypothyroidism
- Previous cardiac history
- Medications
- Toxic exposure
- MI – Inferior wall involving right coronary artery

Signs and Symptoms

- Syncope
- Dizziness
- Chest Pain
- Shortness of Breath
- Exercise Intolerance
- Cool, clammy skin

Risk and Medical Tx of Sinus Bradycardia

Risk

- Reduced Cardiac Output

Medical Treatment

- Atropine
- Pacing if the patient is hemodynamically compromised
- Treatment will be based on whether patient is symptomatic

Sinus Bradycardia Nursing Interventions

- ✓ Assess patient – Are they symptomatic?
- ✓ Give oxygen and monitor oxygen saturation
- ✓ Monitor blood pressure and heart rate
- ✓ Start IV if not already established
- ✓ Notify MD

Sinus Tachycardia

Sinus Tachycardia is a fast heartbeat related to a rapid firing of the sinoatrial (SA) node. The clinical dysrhythmia depends on the underlying cause. It may be normal depending on the patient.



5 Steps to Identify Sinus Tachycardia Rhythm

1. What is the rate?	101-160 beats per minute
2. What is the rhythm?	Atrial rhythm regular Ventricular rhythm regular
3. Is there a P wave before each QRS? Are P waves upright and uniform?	Yes Yes
4. What is the length of the PR interval?	0.12-0.20 seconds (3-5 small squares)
5. Do all QRS complexes look alike? What is the length of the QRS complexes?	Yes 0.06-0.12 seconds (1 ½ to 3 small squares)

Causes and S/S of Sinus Tachycardia

Causes

- Damage to heart tissues from heart disease
- Hypertension
- Fever
- Stress
- Excess alcohol, caffeine, nicotine, or recreational drugs such as cocaine
- A side effect of medications
- Response to pain
- Imbalance of electrolytes
- Hyperthyroidism

Signs and Symptoms

- Dizziness
- Shortness of breath
- Lightheadedness
- Rapid pulse rate
- Heart palpitations
- Chest pain
- Syncope

Risk and Medical Tx of Sinus Tachycardia

Risk

- Cardiac output may fall due to inadequate ventricular filling time
- Myocardial oxygen demand increases
- Can precipitate myocardial ischemia or infarct

Medical Treatment

- Aimed at finding and treating cause

Sinus Tachycardia Nursing Interventions

- ✓ Assess patient – Are they symptomatic? Are they stable?
- ✓ Give oxygen and monitor oxygen saturation
- ✓ Monitor blood pressure and heart rate
- ✓ Start IV if not already established
- ✓ Notify MD

ACLS Protocol

- Look for the cause of the tachycardia and treat it
 - Fever – give acetaminophen or ibuprofen
 - Stimulants – stop use (caffeine, OTC meds, herbs, illicit drugs)
 - Anxiety – give reassurance or ant-anxiety medication
 - Sepsis, Anemia, Hypotension, MI, Heart Failure, Hypoxia
- Narrow QRS Complexes – consider vagal maneuvers, adenosine, beta blocker, calcium channel blocker, or synchronized cardioversion
- Wide QRS Complexes – consider anti-arrhythmic such as procainamide, amiodarone, or sotalol

Sinus Arrhythmia

- Sinus arrhythmia is a normal variation in the beating of your heart. A sinus arrhythmia refers to an irregular or disorganized heart rhythm.
- This rate usually increases with inspiration and decreases with expiration.



5 Steps to Identify Sinus Arrhythmias

1. What is the rate?	60-100 beats per minute
2. What is the rhythm?	Irregular (varies more than 0.08 sec)
3. Is there a P wave before each QRS? Are P waves upright and uniform?	Yes Yes
4. What is the length of the PR interval?	0.12-0.20 seconds (3-5 small squares)
5. Do all QRS complexes look alike? What is the length of the QRS complexes?	Yes 0.06-0.12 seconds (1 ½ to 3 small squares)

Causes and S/S of Sinus Arrhythmia

Cause

- Heart disease
- Moderate to extreme stress
- Excessive consumption of stimulants like caffeine, nicotine, and alcohol
- Intake of medications like diet pills as well as cough and cold medicines

Signs and Symptoms

- Usually asymptomatic

Risk and Medical Tx of Sinus Arrhythmia

Risk

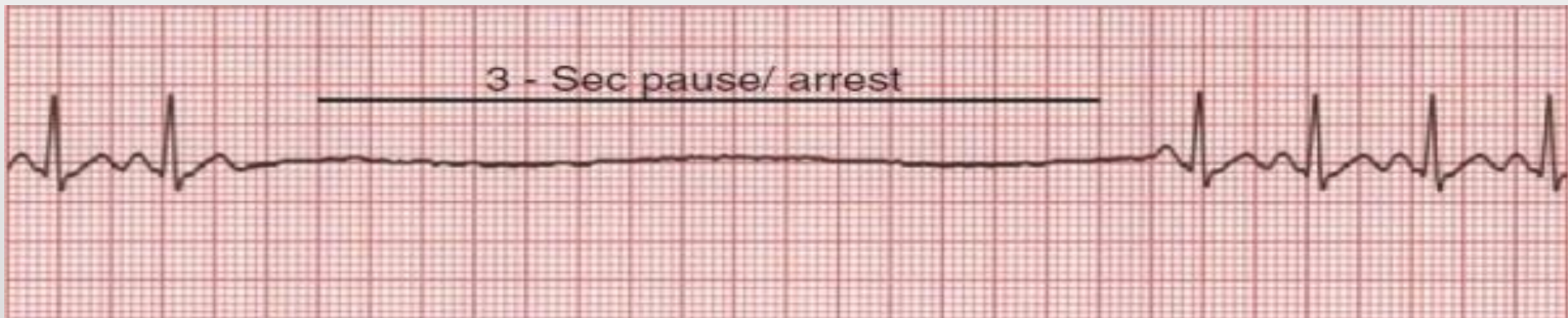
- Reduced cardiac output

Medical Treatment

- Treatment is usually not required unless patient is symptomatic. If patient is symptomatic, find and treat the cause.

Sinus Arrest or Pause

A sinus pause or arrest is defined as the transient absence of sinus P waves that last from 2 seconds to several minutes.



5 Steps to Identify Sinus Arrest Rhythm

1. What is the rate?	Variable, depending on frequency
2. What is the rhythm?	Irregular, when sinus arrest is present
3. Is there a P wave before each QRS? Are P waves upright and uniform?	Yes, if QRS is present Yes, if QRS is present
4. What is the length of the PR interval?	0.12-0.20 seconds (3-5 small squares)
5. Do all QRS complexes look alike? What is the length of the QRS complexes?	Yes, when present 0.06-0.12 seconds (1 ½ to 3 small squares)

Causes and S/S of Sinus Pause/Arrest

Causes

- This may occur in individuals with healthy hearts during sleep
- Myocarditis
- Cardiomyopathy
- MI
- Digitalis toxicity
- Age- elderly
- Vagal stimulation

Signs and Symptoms

- Sometimes asymptomatic
- Syncope
- Dizziness
- LOC
- Bradycardia

Risk and Medical Tx of Sinus Pause/Arrest

Risk

- Sudden cardiac death (rare)
- Syncope
- Fall
- Thromboembolic events including stroke
- CHF
- Atrial tachyarrhythmias - such as atrial flutter or fibrillation

Medical Treatment

- Only treated if patient symptomatic
- Atropine
- Pacemaker

Sinus Pause/Arrest Nursing Interventions

- ✓ Assess Patient
- ✓ Give oxygen and monitor oxygen saturation
- ✓ Monitor blood pressure and heart rate
- ✓ Start IV if not already established
- ✓ Notify MD

ACLS Protocol

- Look for the cause of the sinus arrest and treat it
 - Medication
 - Electrolyte imbalance
 - Natural deterioration of the cardiac system
- May require artificial pacemaker for treatment if symptomatic

Let's Practice!!

References

E-Medicine Health (2012). Retrieved from <http://www.emedicinehealth.com/script/main/hp.asp>

Heart Start Skills (2009). Retrieved from http://www.youtube.com/watch?v=1nhThfSWU7U&feature=autoplay&list=UUDG8UqA26Lcilovorpr_bJQ&playnext=3

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Medscape (2012). Retrieved from <http://www.medscape.com>

Module 4

ATRIAL RHYTHMS

Learning Outcomes

- Identify specific cardiac dysrhythmias
- Describe the appropriate nursing interventions for specific dysrhythmias

Atrial Rhythms

- ♥ When the sinoatrial (SA) node fails to generate an impulse; atrial tissues or internodal pathways may initiate an impulse
- ♥ The 4 most common atrial arrhythmias include:
 - Atrial Flutter (rate varies; usually regular; saw-toothed)
 - Atrial Fibrillation (rate varies, always irregular)
 - Supraventricular Tachycardia (>150 bpm)
 - Premature Atrial Complexes (PAC's)

Atrial Flutter

- Atrial flutter is a **coordinated** rapid beating of the atria. Atrial flutter is the second most common tachyarrhythmia.



F waves in sawtooth pattern

5 Steps to Identify Atrial Flutter Rhythm

1. What is the rate?	Atrial: 250-400 bpm Ventricular: variable
2. What is the rhythm?	Atrial: regular Ventricular: may be irregular
3. Is there a P wave before each QRS? Are P waves upright and uniform?	Normal P waves are absent; flutter waves (f waves) (sawtooth pattern)
4. What is the length of the PR interval?	Not measurable
5. Do all QRS complexes look alike? What is the length of the QRS complexes?	Yes 0.06-0.12 seconds (1 ½ to 3 small squares)

Causes and S/S of Atrial Flutter

Causes

- > 60 years old
- Valve disorder (mitral)
- Thickening of the heart muscle
- Ischemia
- Cardiomyopathy
- COPD
- Emphysema

Signs and Symptoms

- Palpitations
- SOB
- Anxiety
- Weakness
- Angina
- Syncope

Risk and Medical Tx for Atrial Flutter

Risk

- Clot formation in atria (atria not completely emptying)
 - **Stroke**
 - **Pulmonary Embolism**
- Dramatic drop in cardiac output

Medical Treatment

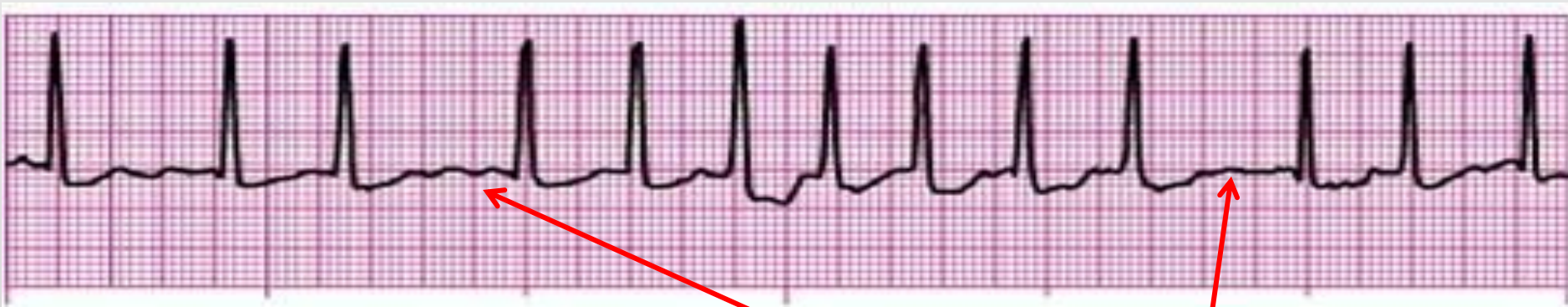
- Cardioversion – treatment of choice
- Antiarrhythmics such as procainamide to convert the flutter
- **Slow the ventricular rate** by using diltiazem, verapamil, digitalis, or beta blocker
- Heparin to reduce incidence of thrombus formation

Atrial Flutter Nursing Interventions

- **Assess Patient**
- **O2 if not already given**
- **Start IV if not already established and hang NS**
- **Notify MD**
- **Prepare for cardioversion**

Atrial Fibrillation

The electrical signal that circles uncoordinated through the muscles of the atria causing them to quiver (sometimes more than 400 times per minute) without contracting. The ventricles do not receive regular impulses and contract out of rhythm, and the heartbeat becomes uncontrolled and irregular. It is the **most common arrhythmia**, and 85 percent of people who experience it are older than 65 years.



No distinguishable P waves

5 Steps to Identify Atrial Fibrillation Rhythm

1. What is the rate?	Atrial: 350-400 bpm Ventricular: variable
2. What is the rhythm?	Irregularly irregular
3. Is there a P wave before each QRS? Are P waves upright and uniform?	Normal P waves are absent; replaced by f waves
4. What is the length of the PR interval?	Not discernable
5. Do all QRS complexes look alike? What is the length of the QRS complexes?	Yes 0.06-0.12 seconds (1 ½ to 3 small squares)

Causes and S/S of Atrial Fibrillation

Causes

- Hypoxia
- Hypertension
- Congestive heart failure
- Coronary artery disease
- Dysfunction of the sinus node
- Mitral valve disorders
- Rheumatic heart disease
- Pericarditis
- Hyperthyroidism
- Excessive alcohol or caffeine consumption

Signs and Symptoms

- Heart palpitations
- Irregular pulse which feels too rapid or too slow, racing, pounding or fluttering
- Dizziness or light-headedness
- Fainting
- Confusion
- Fatigue
- Trouble breathing
- Difficulty breathing when lying down
- Sensation of tightness in the chest

Risk and Medical Tx of Atrial Fibrillation

Risk

- Clot formation in atria (atria not completely emptying)
 - **Stroke**
 - **Pulmonary Embolism**
- Dramatic drop in cardiac output

Medical Treatment

- **Rate control**
(slow ventricular rate to 80-100 beats/minute)
 - Digoxin
 - Beta-adrenergic blockers
 - Calcium channel blockers
 - Example - Verapamil (give IV if needed for quick rate control)
- **Antithrombotic therapy**
- **Correction of rhythm**
 - Chemical or electrical cardioversion

Atrial Fibrillation Nursing Interventions

- Assess Patient
- O2 if not already given
- Start IV if not already established and hang NS
- Notify MD
- Prepare for cardioversion
- [Let's see more](#)

Supraventricular Tachycardia (SVT)

- Encompasses all fast (tachy) dysrhythmias in which heart rate is greater than 150 beats per minute (bpm)



5 Steps to Identify Supraventricular Tachycardia Rhythm

1. What is the rate?	Atrial: 150-250 bpm Ventricular: 150-250 bpm
2. What is the rhythm?	Regular
3. Is there a P wave before each QRS? Are P waves upright and uniform?	Usually not discernable, especially at the high rate range (becomes hidden in the QRS)
4. What is the length of the PR interval?	Usually not discernable
5. Do all QRS complexes look alike? What is the length of the QRS complexes?	Yes 0.06-0.12 seconds (1 ½ to 3 small squares)

Causes and S/S of SVT

Causes

- Find underlying cause
- Stimulants
- Hypoxia
- Stress or over-exertion
- Hypokalemia
- Atherosclerotic heart disease

Signs and Symptoms

- Palpitations
- Chest discomfort (pressure, tightness, pain)
- Lightheadedness or dizziness
- Syncope
- Shortness of breath
- A pounding pulse.
- Sweating
- Tightness or fullness in the throat
- Tiredness (fatigue)
- Excessive urine production

Risk and Medical Tx of SVT

Risk

- Heart failure with prolonged SVT

Medical Treatment

- Stable patient's (asymptomatic)
 - **Vagal maneuvers**
- Drug management
 - **Adenosine**
- Cardioversion if unstable

SVT Nursing Interventions

- Assess Patient
- O2 if not already given
- Vagal maneuvers (cough and valsalva)
- Start IV if not already established and hang NS
- Notify MD
- Prepare for cardioversion

Premature Atrial Contractions (PAC's)

- A PAC is not a rhythm, it is an ectopic beat that originates from the atria.
- Normal beat, but just occurs early!



5 Steps to Identify Premature Atrial Contraction (PAC)

1. What is the rate?	Usually regular but depends on the underlying rhythm
2. What is the rhythm?	Irregular as a result of the PAC
3. Is there a P wave before each QRS? Are P waves upright and uniform?	Usually upright but premature and abnormal shape
4. What is the length of the PR interval?	0.12-0.20 seconds (3-5 small boxes)
5. Do all QRS complexes look alike?	Yes
What is the length of the QRS complexes?	0.06-0.12 seconds (1 ½ to 3 small squares)

Cause and S/S PAC's

Cause

- Occurs in healthy patients without heart disease
- Stress
- Stimulants
- Hypertension
- Valvular condition
- Infectious diseases
- Hypoxia

Signs and Symptoms

- Palpitations
- Skipped beat

Risk and Medical Tx PAC's

Risk

- Most benign – no risk
- May be a sign of underlying heart condition

Medical Treatment

- No treatment necessary if asymptomatic
- Treat the cause
- Drug therapy
 - Beta Blockers
 - Calcium Channel Blockers

PAC Nursing Interventions

- Assess patient
- Monitor patient

Let's Practice!!

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Module 5

VENTRICULAR RHYTHMS

Objectives

- Recognize ventricular dysrhythmias on EKG and relate cause, significance, symptoms, and treatment.

Ventricular Rhythms

- ♥ When the sinoatrial (SA) node and the AV Junctional tissues fails to generate an impulse the ventricles will assume the role of pacing the heart
- ♥ There is an absence of P waves because there is no atrial activity or depolarization
- ♥ Ventricular rhythms will display QRS complexes that are wide (greater than or equal to 0.12 seconds) and bizarre in appearance

Ventricular Rhythms

The most common variations:

- ♥ Premature ventricular contractions (PVC's)

These 8 rhythms are the **lethal** ones: **KNOW THESE**

- ♥ Idioventricular rhythm (ventricular escape rhythm; rate usually >20 – <40 bpm)
- ♥ Accelerated Idioventricular rhythm (>40 bpm)
- ♥ Agonal rhythm (20 or less bpm)
- ♥ Ventricular tachycardia (>150 bpm)
- ♥ Ventricular fibrillation
- ♥ Torsades de Pointes
- ♥ Pulseless Electrical Activity (PEA)
- ♥ Asystole - Cardiac Standstill

Premature Ventricular Contractions

- A PVC is not a rhythm, but an ectopic beat that arises from an irritable site in the ventricles.
- PVCs appear in many different patterns and shapes, but are always wide and bizarre compared to a “normal” beat



5 Steps to Identify Premature Ventricular Contractions (PVC's)

<p>1. What is the rate?</p>	<p>Atrial: usually normal Ventricular: usually normal Depends on underlying rhythm</p>
<p>2. What is the rhythm?</p>	<p>Depends on underlying rhythm; Irregular during PVC's</p>
<p>3. Is there a P wave before each QRS?</p> <p>Are P waves upright and uniform?</p>	<p>Absent with PVC's</p>
<p>4. What is the length of the PR interval?</p>	<p>Not measureable during PVC's</p>
<p>5. Do all QRS complexes look alike?</p> <p>What is the length of the QRS complexes?</p>	<p>Varies Wide and bizarre (>0.12 sec), occurs earlier than expected</p>

PVC Patterns

Ventricular bigeminy



PVC occurs every other beat

Ventricular trigeminy

PVC occurs every third beat

Ventricular quadrigeminy

PVC occurs every fourth beat

Couplets



Two PVC's together

Runs of ventricular tachycardia (VT)

Three or more PVC's in a row

Causes and S/S of PVC's

Causes

- Exercise
- Stress
- Caffeine
- Heart disease: MI, CHF, Cardiomyopathy, Mitral valve prolapse
- Electrolyte imbalances
- Hypoxia
- Tricyclic antidepressants
- Digitalis toxicity

Signs and Symptoms

- Palpitations
- Weakness
- Dizziness
- Hypotension

Risk and Medical Tx of PVC's

Risk

- Reduced cardiac output
- Heart failure
- May convert to V-Tach or V-Fib

Treatment

- Oxygen
- Treat the cause
- Lidocaine is the drug of choice, although procainamide is sometimes used

Nursing Interventions for PVC's

- **Assess patient**
- **O2 at 2 liters; Oxygen may abate the PVC's**
- **Start IV if not already established and hang NS**
- **Monitor for frequent PVC's and deterioration to more serious rhythms**

Idioventricular Rhythm

Idioventricular arrhythmia is also termed ventricular escape rhythm. It is considered a last-ditch effort of the ventricles to try to prevent cardiac standstill.

- The SA node and AV node have failed
- Rate usually between 20 to 40 beats per minute (bpm)
- Cardiac output is compromised!!



Keys to identifying: rhythm is SLOW, no P wave, wide & bizarre QRS!

5 Steps to Identify Idioventricular Rhythm

1. What is the rate?	Ventricular: 20-40 bpm
2. What is the rhythm?	Usually regular
3. Is there a P wave before each QRS? Are P waves upright and uniform?	Absent
4. What is the length of the PR interval?	Not measureable
5. Do all QRS complexes look alike? What is the length of the QRS complexes?	Wide and bizarre (>0.12 sec), with T wave deflection

Causes and S/S of Idioventricular Rhythm

Causes

- Drugs- Digitalis
- MI
- Metabolic imbalances
- Hyperkalemia
- Cardiomyopathy

Signs and Symptoms

- Pale
- Cool with mottled skin
- Weakness
- Dizziness
- Hypotension
- Alteration in mental status

Risk and Medical Tx of Idioventricular Rhythm

Risk

- Usually a terminal event occurring before ventricular standstill
- Death- cardiac arrest

Medical Treatment

- **Atropine**
- **Pacing**
- Dopamine when hypotensive
- CPR

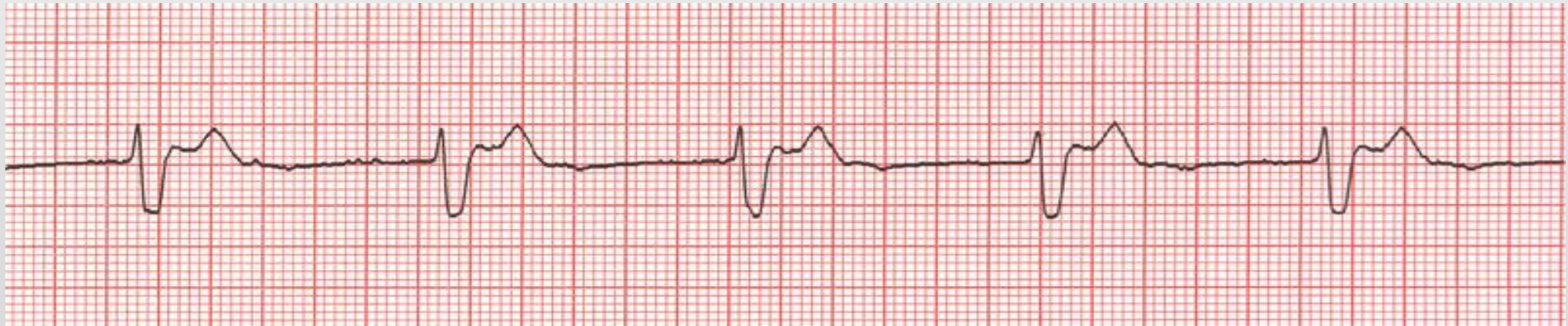
Nursing Interventions Idioventricular Rhythm

- **Assess your patient: patient will most likely be symptomatic with a weak, thready pulse**
- **Run continuous monitor strips/record**
- **Begin CPR**
- **Call Code Blue**
- **Notify MD**
- **Start IV if not already established and hang NS**

Accelerated Idioventricular Rhythm

Accelerated idioventricular arrhythmia is last-ditch effort of the ventricles to try to prevent cardiac standstill.

- The SA node and AV node have failed
- Rate usually between 40 to 100 beats per minute (bpm)
- Cardiac output is compromised



5 Steps to Identify Accelerated Idioventricular Rhythm

1. What is the rate?	Ventricular: 41-100 bpm
2. What is the rhythm?	Usually regular
3. Is there a P wave before each QRS? Are P waves upright and uniform?	Absent
4. What is the length of the PR interval?	Not measureable
5. Do all QRS complexes look alike? What is the length of the QRS complexes?	Wide and bizarre (>0.12 sec), with T wave deflection

Causes and S/S of Accelerated Idioventricular Rhythm

Causes

- Drugs- Digitalis
- MI
- Metabolic imbalances
- Hyperkalemia
- Cardiomyopathy

Signs and Symptoms

- Pale
- Cool with mottled skin
- Weakness
- Dizziness
- Hypotension
- Alterations in mental status

Risk and Medical Tx of Accelerated Idioventricular Rhythm

Risk

- Usually a terminal event occurring before ventricular standstill
- Death- cardiac arrest

Medical Treatment

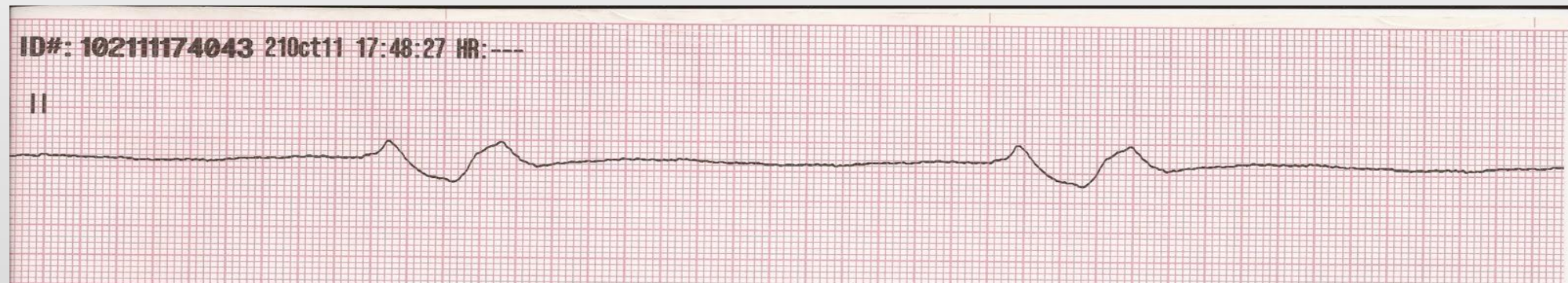
- Atropine
- Pacing
- Dopamine when hypotensive
- CPR

Nursing Interventions for Accelerated Idioventricular Rhythm

- **Assess your patient: patient will most likely be symptomatic with a weak, thready pulse**
- **Run continuous monitor strips/record**
- **Begin CPR**
- **Call Code Blue**
- **Notify MD**
- **Start IV if not already established and hang NS**

Agonal Rhythm

Agonal rhythm is when the Idioventricular rhythm is 20 beats or less per minute. Frequently is seen as the last-ordered semblance of a heart rhythm when resuscitation efforts are unsuccessful.



5 Steps to Identify an Agonal Rhythm

1. What is the rate?	Ventricular: ≤ 20 bpm VERY SLOW!!
2. What is the rhythm?	Usually regular
3. Is there a P wave before each QRS? Are P waves upright and uniform?	Absent
4. What is the length of the PR interval?	Not measureable
5. Do all QRS complexes look alike? What is the length of the QRS complexes?	Wide and bizarre (>0.12 sec), with T wave deflection

Causes and S/S of Agonal Rhythm

Causes

- Trauma
- Acute MI
- Natural progression to death

Signs and Symptoms

- Loss of consciousness
- No palpable pulse or measurable BP

Risk and Medical Tx of Agonal Rhythm

Risk

- Death

Medical Treatment

- CPR/ACLS Protocol
- If life saving efforts have already been attempted no further treatment

Nursing Interventions for a Agonal Rhythm

- Make sure there aren't any loose leads or leads that have come off the patient
- Call a Code Blue
- Start CPR
- Notify MD

If death is the expected outcome:

- Monitor vital signs
- Record rhythm progression
- Support family and friends

Ventricular Tachycardia

- Ventricular tachycardia almost always occurs in diseased hearts.
- Rhythm in which three or more PVCs arise in sequence at a rate greater than 100 beats per minute.
- V-tach can occur in short bursts lasting less than 30 seconds, causing few or no symptoms.
- Sustained v-tach lasts for more than 30 seconds and requires immediate treatment to prevent death.
- V-tach can quickly deteriorate into ventricular fibrillation.



5 Steps to Identify Ventricular Tachycardia (V-Tach)

1. What is the rate?	101-250 bpm
2. What is the rhythm?	Atrial rhythm not distinguishable Ventricular rhythm usually regular
3. Is there a P wave before each QRS? Are P waves upright and uniform?	No
4. What is the length of the PR interval?	Not measureable
5. Do all QRS complexes look alike? What is the length of the QRS complexes?	Wide and bizarre (>0.12 sec)

Causes and S/S of V-Tach

Causes

- Usually occurs with underlying heart disease
- Commonly occurs with myocardial ischemia or infarction
- Certain medications may prolong the QT interval predisposing the patient to ventricular tachycardia
- Electrolyte imbalance
- Digitalis toxicity
- Congestive heart failure

Signs and Symptoms

- Chest discomfort (angina)
- Syncope
- Light-headedness or dizziness
- Palpitations
- Shortness of breath
- Absent or rapid pulse
- Loss of consciousness
- Hypotension

Risk and Medical Tx of V-Tach

Risk

- Major cause of sudden cardiac death

Medical Treatment

- If there is no pulse, begin CPR and follow ACLS protocol
- If there is a pulse and the patient is unstable - cardiovert and begin drug therapy
 - Amiodarone
 - Lidocaine
- With chronic or recurrent VT
 - Give antiarrhythmics
 - Long term may need ICD placed
 - Ablation may be used for reentry

Nursing Interventions for V-Tach

- ♥ Assess your patient
- ♥ If symptomatic, treatment must be aggressive and immediate
 - ♥ Pulse present
 - Oxygen
 - Patent IV (preferably x2)
 - Monitor patient very closely
 - ♥ Pulseless
 - Call Code Blue
 - Begin CPR
 - Defibrillate ASAP
 - Start IV if not already established and hang NS
 - Notify MD
- [Let's see more](#)

Ventricular Fibrillation

- ♥ V-Fib (coarse and fine)
- ♥ Occurs as a result of multiple weak ectopic foci in the ventricles
- ♥ No coordinated atrial or ventricular contraction
- ♥ Electrical impulses initiated by multiple ventricular sites; impulses are not transmitted through normal conduction pathway



5 Steps to Identify Ventricular Fibrillation

1. What is the rate?	Not discernible
2. What is the rhythm?	Rapid, unorganized, not discernable
3. Is there a P wave before each QRS? Are P waves upright and uniform?	No
4. What is the length of the PR interval?	None
5. Do all QRS complexes look alike? What is the length of the QRS complexes?	None

Causes and S/S of V-Fib

Causes

- AMI
- Untreated VT
- Electrolyte imbalance
- Hypothermia
- Myocardial ischemia
- Drug toxicity or overdose
- Trauma

Signs and Symptoms

- Loss of consciousness
- Absent pulse

Risk and Medical Tx of V-Fib

Risk

- Death

Medical treatment

- CPR with immediate defibrillation
- Initiate ACLS algorithm

Nursing Interventions V-Fib

- Assess your patient
 - Many things can mimic v-fib on a monitor strip such as electric razor or shivering
 - You must check your patient!
- Treatment must be aggressive and immediate
 - **Start CPR/ACLS**
 - **Call a Code Blue**
 - **Defibrillate ASAP**
- **Start IV if not already established and hang NS**
- **Notify MD**

Torsades de Pointes Rhythm

- Torsades de pointes is associated with a prolonged QT interval. Torsades usually terminates spontaneously but frequently recurs and may degenerate into ventricular fibrillation.
- The hallmark of this rhythm is the upward and downward deflection of the QRS complexes around the baseline. The term **Torsades de Pointes** means “twisting about the points.”



5 Steps to Identify Torsades de Pointes

1. What is the rate?	Ventricular: 150-250 bpm
2. What is the rhythm?	Regular or irregular
3. Is there a P wave before each QRS? Are P waves upright and uniform?	No
4. What is the length of the PR interval?	Not measurable
5. Do all QRS complexes look alike? What is the length of the QRS complexes?	Wide and bizarre, some deflecting downward and some deflecting upward

Causes and S/S of Torsades de Pointes

Causes

- Is associated with prolonged QT interval
- Is often caused by drugs conventionally recommended in treating VT
- Phenothiazine or tricyclic antidepressant overdose
- Electrolyte disturbances, especially hypokalemia and hypomagnesemia

Signs and Symptoms

- Chest pain
- Loss of consciousness
- Dizziness
- Nausea
- Shortness of breath

Risk and Medical Tx of Torsades de Pointes

Risk

- Death

Medical Treatment

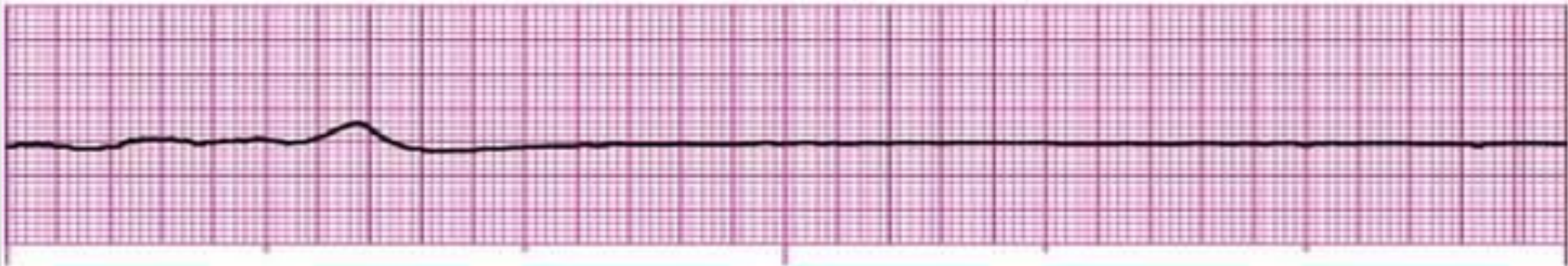
- Begin CPR and other code measures
- Eliminate predisposing factors - rhythm has tendency to recur unless precipitating factors are eliminated
- Administrate magnesium sulfate bolus
- Synchronized cardioversion is indicated when the patient is unstable if possible or defibrillate

Nursing Interventions for Torsades de Pointes

- Assess your patient
- Make sure there aren't any loose leads or leads that have come off the patient
- Start CPR
- Call a Code Blue
 - Start IV if not already established and hang NS
 - Notify MD
 - Must treat the cause – usually giving Magnesium

Asystole

- Ventricular standstill



5 Steps to Identify Asystole

1. What is the rate?	none
2. What is the rhythm?	none
3. Is there a P wave before each QRS? Are P waves upright and uniform?	none
4. What is the length of the PR interval?	none
5. Do all QRS complexes look alike? What is the length of the QRS complexes?	none

Causes and S/S of Asystole

Causes

- Extensive myocardial damage, secondary to acute myocardial infarction
- Failure of higher pacemakers
- Cardiac tamponade
- Prolonged v-fib
- Pulmonary embolism

Signs and Symptoms

- No palpable pulse
- No measurable BP
- Loss of consciousness

Risk and Medical Tx of Asystole

Risk

- Deader – they are already dead

Medical Treatment

- CPR
- ACLS protocol

Nursing Interventions for Asystole

- ♥ Assess your patient
- ♥ Make sure there aren't any loose leads or leads that have come off the patient
- ♥ Treatment must be aggressive and immediate
 - **Call a Code Blue**
 - **Start CPR/ACLS**

Pulseless Electrical Activity (PEA)

- Electricity is working, but the mechanics and plumbing are not.
- The absence of a palpable pulse and absence of myocardial muscle activity with presence of organized electrical activity on the cardiac monitor. The patient is clinically dead despite some type of organized rhythm on monitor.



Causes and S/S of PEA

Causes: H's and T's

- **Hypovolemia #1 cause**
- Hypoxia
- Hydrogen ions (acidosis)
- Hypo / Hyperkalemia
- Hypothermia
- Toxins
- Tamponade (cardiac)
- Tension pneumothorax
- Thrombosis (coronary or pulmonary)
- Trauma
- Massive MI
- Overdose of tricyclic antidepressants

Signs and Symptoms

- Pulselessness
- Loss of consciousness
- No palpable BP

Risk and Medical Tx of PEA

Risk

- Death – this rhythm has no cardiac activity associated with it

Medical Treatment

- Determine cause & treat
- CPR
- Initiate ACLS protocol

Nursing Interventions PEA

- ♥ Assess your patient
- ♥ Treatment must be aggressive and immediate
 - Call a Code Blue
 - Start CPR/ACLS
 - Run continuous monitor strips/Record
 - Start IV if not already established and hang NS
 - Notify MD

Click on the links!

Let's Practice!!

All types of strips

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It's time to practice!!



Rhythm Identification

- This rhythm strip is from an 86-year-old woman who experienced a cardiopulmonary arrest. The initial rhythm was asystole. The following rhythm resulted after IV administration of epinephrine and atropine.





Ventricular rate/rhythm	40 bpm/regular
Atrial rate/rhythm	None
PR interval	None
QRS duration	0.18 sec
Identification	Idioventricular rhythm (IVR) (ventricular escape rhythm)

Rhythm Identification

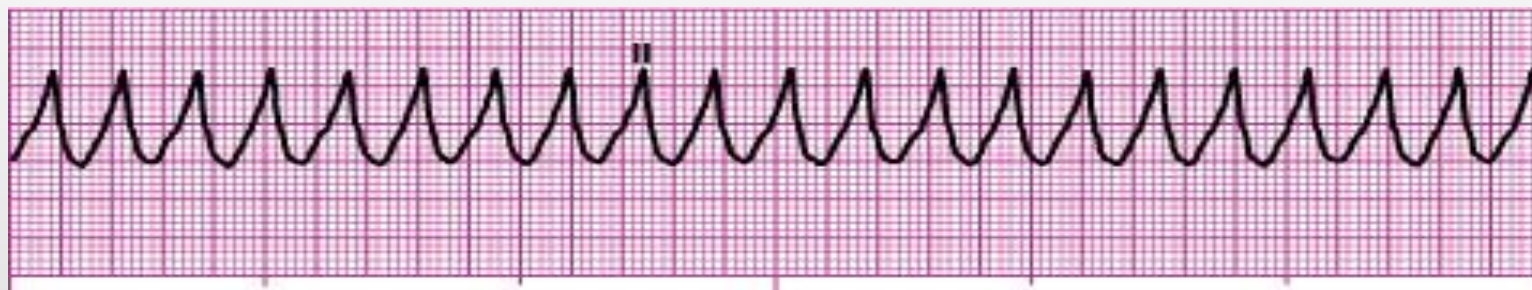
- This rhythm strip is from a 69-year-old man complaining of shortness of breath. Lung sounds reveal bilateral rales. Blood pressure: 160/58.

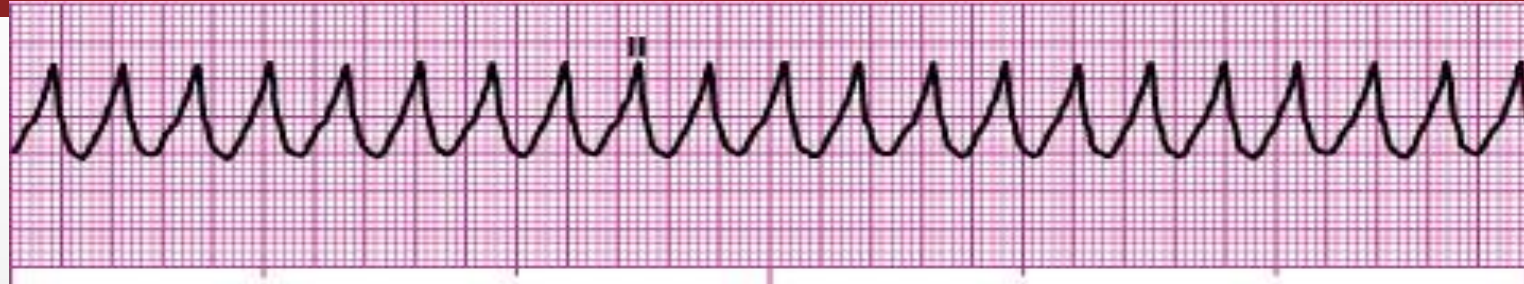




Ventricular rate/rhythm	107 bpm (sinus beats)/ Regular except for the events
Atrial rate/rhythm	107 bpm (sinus beats)/ Regular except for the events
PR interval	0.20 sec (sinus beats)
QRS duration	0.08 sec (sinus beats)
Identification	Sinus tachycardia with uniform PVCs

Rhythm Identification





Ventricular rate/rhythm	214 bpm/regular
Atrial rate/rhythm	Unable to determine
PR interval	Unable to determine
QRS duration	0.14 sec
Identification	Monomorphic ventricular tachycardia

Rhythm Identification





Ventricular rate/rhythm	214 bpm (VT) to 71 bpm (atrial fib)/ Irregular
Atrial rate/rhythm	Unable to determine
PR interval	Unable to determine
QRS duration	0.12 to 0.16 sec (VT) to 0.06 sec (atrial fib)
Identification	Monomorphic VT to atrial fibrillation

Rhythm Identification



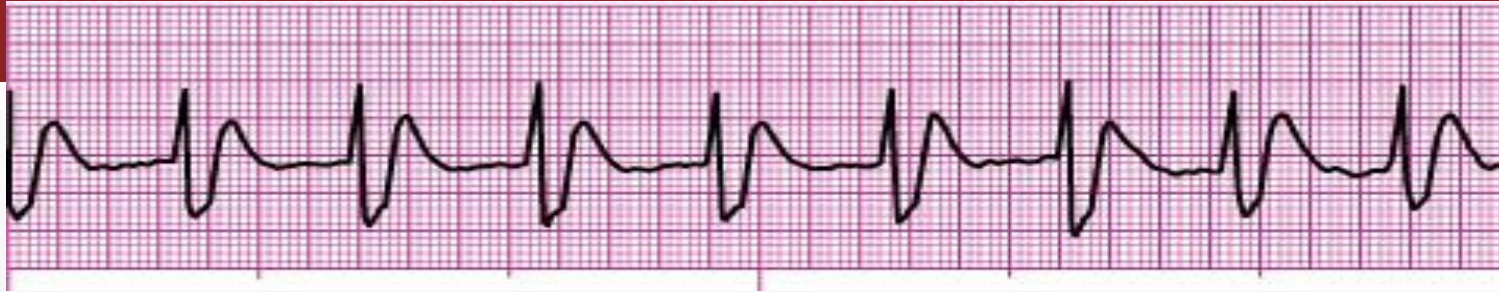


Ventricular rate/rhythm	88 bpm/regular
Atrial rate/rhythm	Unable to determine
PR interval	Unable to determine
QRS duration	0.06 sec
Identification	Atrial flutter with ST-segment depression

Rhythm Identification

- This rhythm strip is from a 52-year-old man found unresponsive, apneic, and pulseless.





Ventricular rate/rhythm	88 bpm/regular
Atrial rate/rhythm	None
PR interval	None
QRS duration	0.12 to 0.14 sec
Identification	Accelerated idioventricular rhythm (AIVR)

Rhythm Identification

- These rhythm strips are from a 78-year-old man complaining of shortness of breath. He has a history of COPD, coronary artery disease, and hypertension.





Ventricular rate/rhythm	55 to 94 bpm/irregular
Atrial rate/rhythm	Unable to determine
PR interval	Unable to determine
QRS duration	0.10 sec
Identification	Atrial fibrillation (controlled)

Rhythm Identification

- This rhythm strip is from an 86-year-old woman complaining of chest pain that she rates a 4 on a scale of 0 to 10. Blood pressure: 142/72.





Ventricular rate/rhythm	60 bpm/regular
Atrial rate/rhythm	60 bpm/regular
PR interval	0.20 sec
QRS duration	0.06 sec
Identification	Sinus rhythm

Rhythm Identification

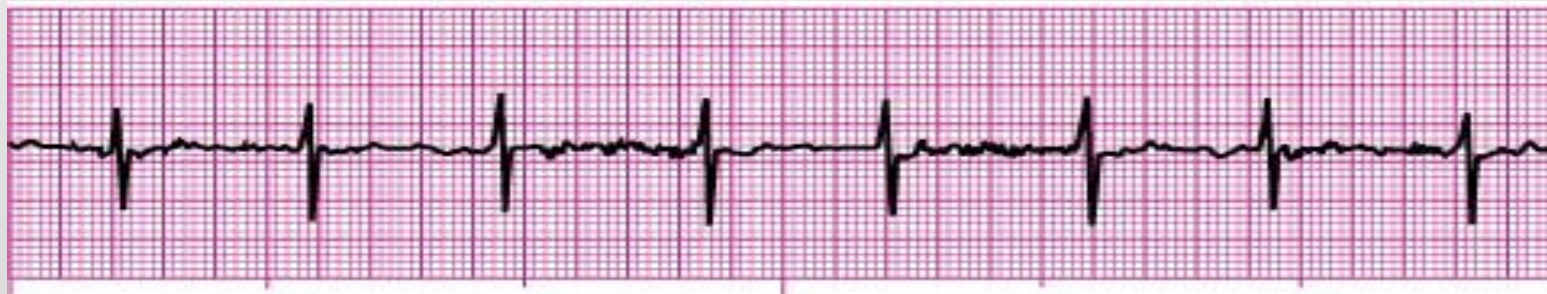




Ventricular rate/rhythm	115 bpm (sinus beats)/ Regular except for the event
Atrial rate/rhythm	115 bpm (sinus beats)/ Regular except for the event
PR interval	0.16 sec
QRS duration	0.08 to 0.10 sec
Identification	Sinus tachycardia with PACs

Rhythm Identification

- This rhythm strip is from an 83-year-old man complaining of chest pain. He had a new pacemaker implanted 5 days ago. His blood pressure is 148/60.





Ventricular rate/rhythm	79 bpm/regular
Atrial rate/rhythm	Unable to determine
PR interval	Unable to determine
QRS duration	0.08 sec
Identification	Atrial fibrillation (controlled)

Rhythm Identification

- This rhythm strip is from a 52-year-old man with substernal chest pain. He has a history of COPD and mitral valve regurgitation. Blood pressure: 140/78.





Ventricular rate/rhythm	75 bpm/regular
Atrial rate/rhythm	75 bpm/regular
PR interval	0.14 sec
QRS duration	0.06 to 0.08 sec
Identification	Sinus rhythm with ST-segment depression

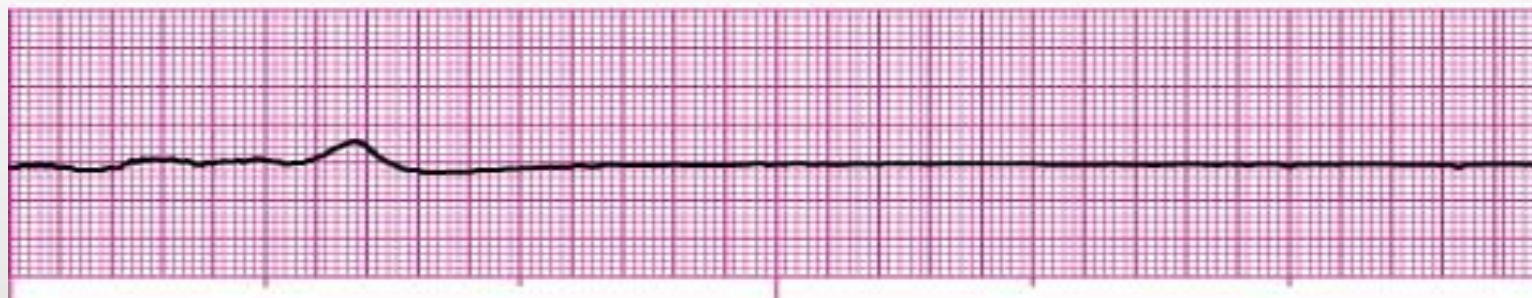
Rhythm Identification





Ventricular rate/rhythm	54 bpm/regular
Atrial rate/rhythm	Unable to determine
PR interval	Unable to determine
QRS duration	0.08 sec
Identification	Atrial fibrillation (controlled)

Rhythm Identification





Ventricular rate/rhythm	None
Atrial rate/rhythm	None
PR interval	None
QRS duration	None
Identification	Asystole

Rhythm Identification

- This rhythm strip is from a 1-month-old infant after a 3-minute seizure.





Ventricular rate/rhythm	130 bpm/regular
Atrial rate/rhythm	130 bpm/regular
PR interval	0.14 to 0.16 sec
QRS duration	0.06 to 0.08 sec
Identification	Sinus tachycardia

Rhythm Identification

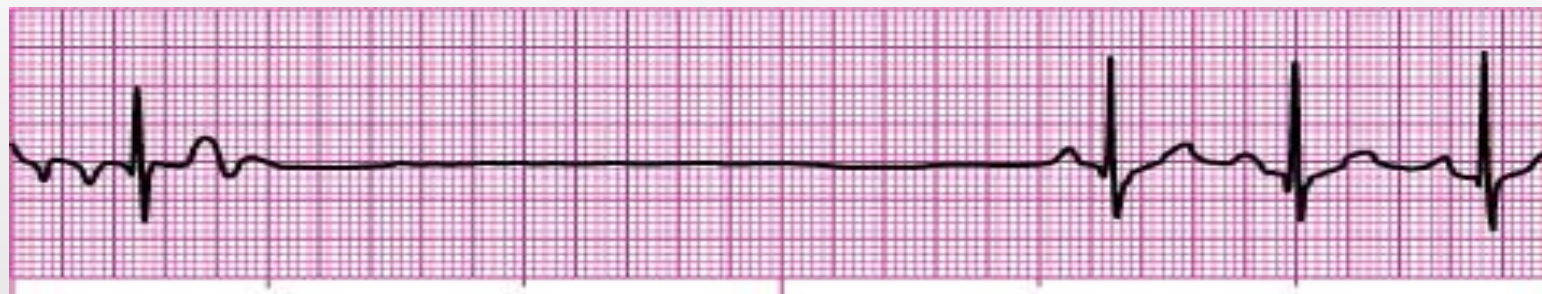
- This rhythm strip is from a 77-year-old woman with a congested cough.

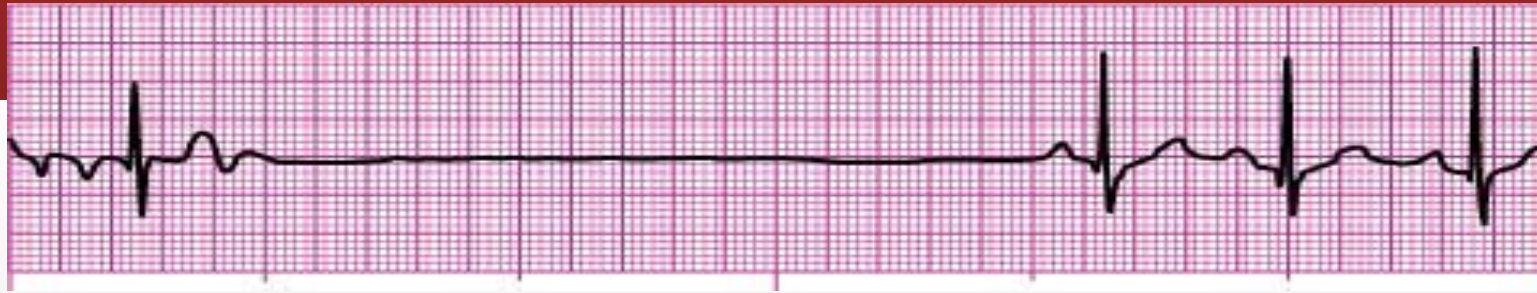




Ventricular rate/rhythm	107 to 200 bpm/irregular
Atrial rate/rhythm	Unable to determine
PR interval	Unable to determine
QRS duration	0.06 to 0.08 sec
Identification	Atrial fibrillation (uncontrolled)

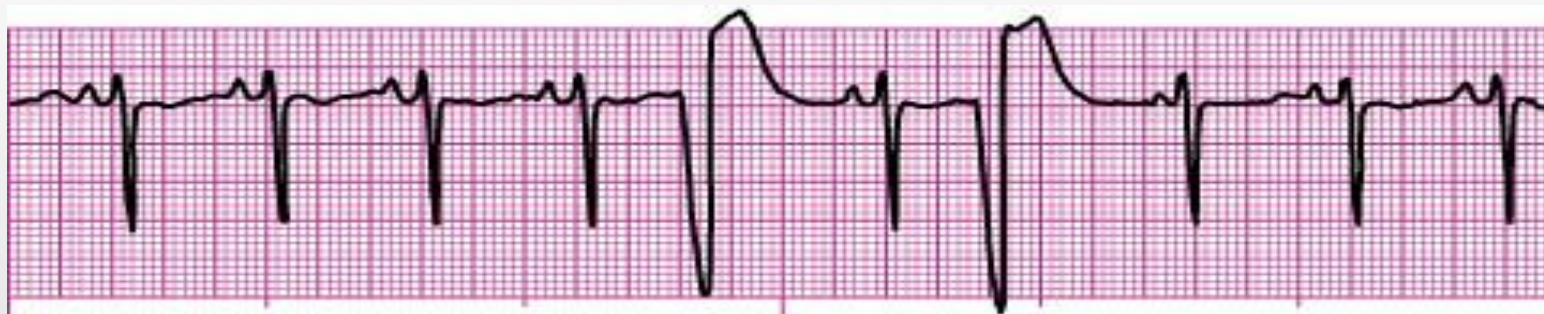
Rhythm Identification

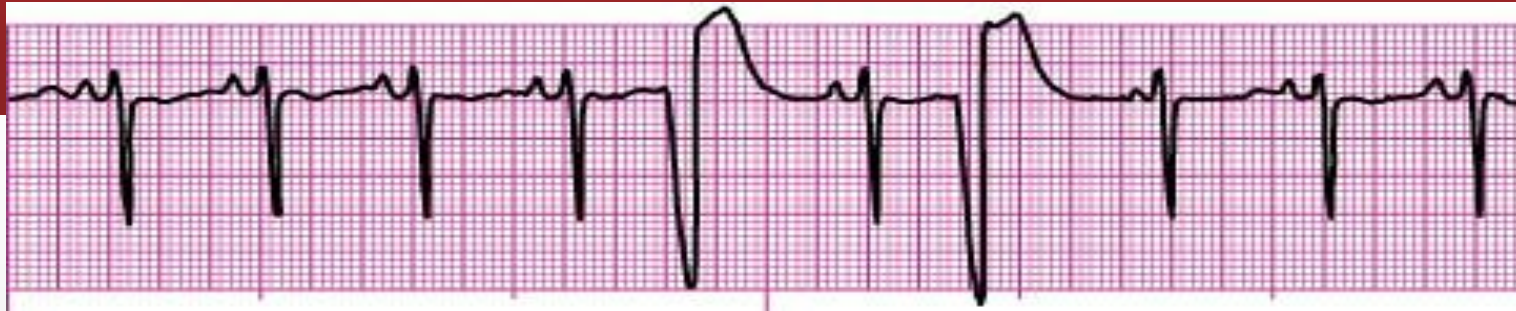




Ventricular rate/rhythm	83 bpm (sinus beats)/regular
Atrial rate/rhythm	83 bpm (sinus beats)/regular
PR interval	0.20 sec (sinus beats)
QRS duration	0.06 to 0.08 sec (sinus beats)
Identification	Atrial flutter – pause – sinus rhythm

Rhythm Identification





Ventricular rate/rhythm	96 bpm (sinus beats)/ Regular except for the event
Atrial rate/rhythm	96 bpm (sinus beats)/ Regular except for the event
PR interval	0.12 sec (sinus beats)
QRS duration	0.08 to 0.10 sec (sinus beats)
Identification	Sinus rhythm with uniform PVCs

Rhythm Identification

- This rhythm strip is from a 54-year-old man who had a syncopal episode.





Ventricular rate/rhythm	58 bpm/regular
Atrial rate/rhythm	58 bpm/regular
PR interval	0.20 sec
QRS duration	0.08 sec
Identification	Sinus bradycardia

Rhythm Identification

- This rhythm strip is from a 43-year-old woman complaining of palpitations.





Ventricular rate/rhythm	214 bpm/regular
Atrial rate/rhythm	Unable to determine
PR interval	Unable to determine
QRS duration	0.08 sec
Identification	Supraventricular tachycardia

Rhythm Identification





Ventricular rate/rhythm	Unable to determine
Atrial rate/rhythm	Unable to determine
PR interval	Unable to determine
QRS duration	Unable to determine
Identification	Ventricular fibrillation (coarse)

Rhythm Identification

- This rhythm strip is from an 88-year-old woman complaining of hip pain after a fall injury.





Ventricular rate/rhythm	68 to 125 bpm/irregular
Atrial rate/rhythm	Unable to determine
PR interval	Unable to determine
QRS duration	0.08 sec
Identification	Atrial fibrillation

Rhythm Identification

- This rhythm strip is from an 82-year-old woman with vomiting x 2 days.





Ventricular rate/rhythm	115 bpm/regular
Atrial rate/rhythm	115 bpm/regular
PR interval	0.18 sec
QRS duration	0.06 sec
Identification	Sinus tachycardia

Rhythm Identification

- This rhythm strip is from a 62-year-old woman complaining of chest pain. Her blood pressure is 146/104, respirations are 20. Breath sounds are clear.





Ventricular rate/rhythm	167 bpm/regular
Atrial rate/rhythm	Unable to determine
PR interval	Unable to determine
QRS duration	0.06 sec
Identification	Narrow-QRS tachycardia (SVT) with ST-segment depression

Rhythm Identification

- This rhythm strip is from a 6-year-old boy immediately after a seizure.

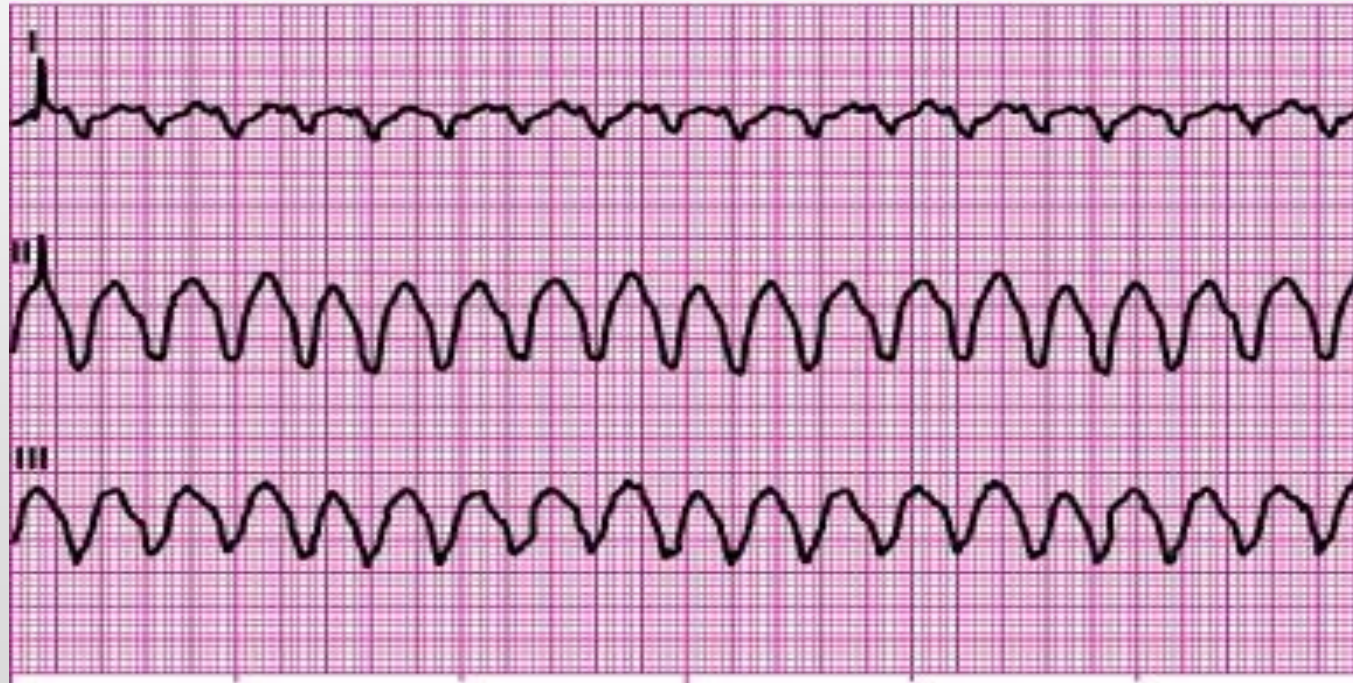


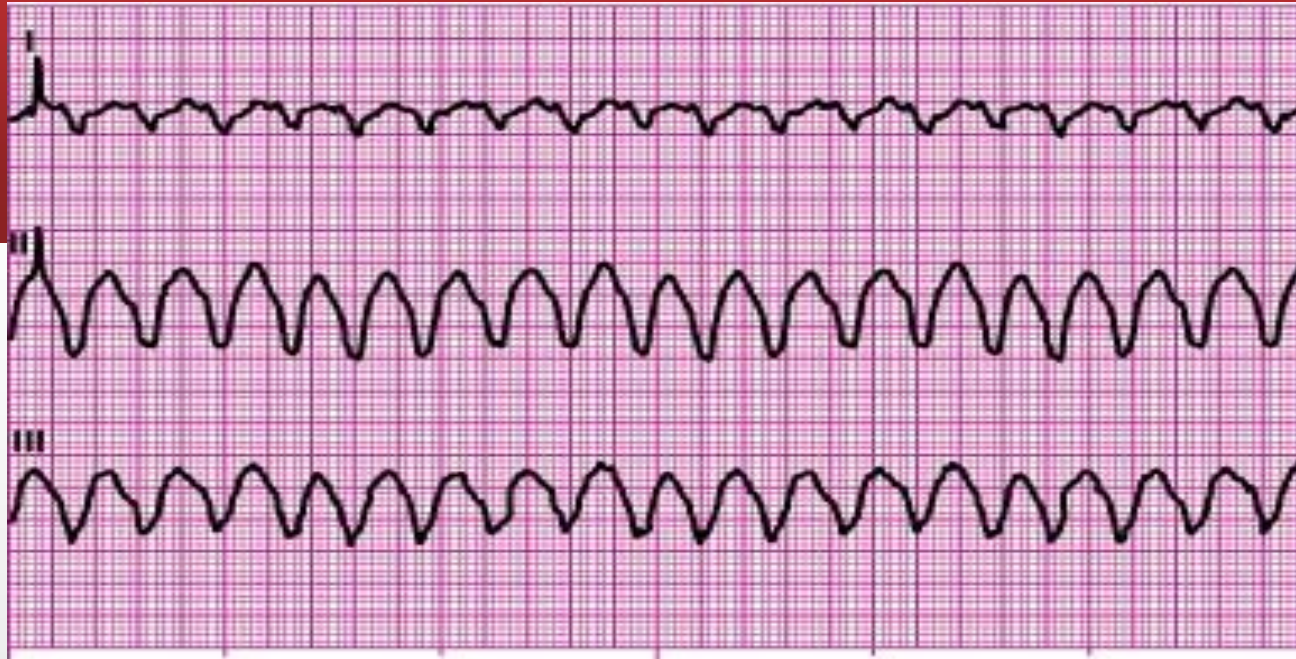


Ventricular rate/rhythm	68 to 88 bpm/irregular
Atrial rate/rhythm	68 to 88 bpm/irregular
PR interval	0.12 sec
QRS duration	0.08 sec
Identification	Sinus arrhythmia

Rhythm Identification

- These rhythm strips are from a 44-year-old woman complaining of chest pain.





Ventricular rate/rhythm	176 bpm/regular
Atrial rate/rhythm	None
PR interval	None
QRS duration	0.12 to 0.14 sec
Identification	Monomorphic ventricular tachycardia

Rhythm Identification

- This rhythm strip is from an 81-year-old woman complaining of chest pain.





Ventricular rate/rhythm	76 bpm/regular
Atrial rate/rhythm	None
PR interval	None
QRS duration	0.12 to 0.14 sec
Identification	Accelerated idioventricular rhythm (AIVR)

Rhythm Identification





Ventricular rate/rhythm	42 bpm (sinus beats)/ Regular except for the event (every other beat is an ectopic beat)
Atrial rate/rhythm	42 bpm (sinus beats)/ Regular except for the event
PR interval	0.12 sec (sinus beats)
QRS duration	0.08 to 0.10 sec (sinus beats)
Identification	Sinus bradycardia with ventricular bigeminy

Rhythm Identification



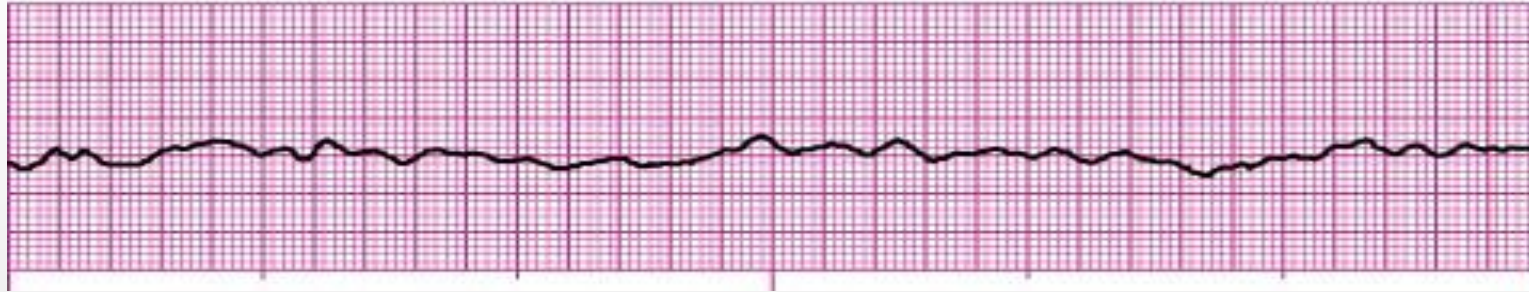


Ventricular rate/rhythm	42 bpm/regular
Atrial rate/rhythm	None
PR interval	None
QRS duration	0.24 sec
Identification	Accelerated idioventricular rhythm (AIVR)

Rhythm Identification

- This rhythm strip is from an 18-year-old man with a gunshot wound to his chest.





Ventricular rate/rhythm	Unable to determine
Atrial rate/rhythm	None
PR interval	None
QRS duration	None
Identification	Coarse ventricular fibrillation

Rhythm Identification





Ventricular rate/rhythm	88/min/regular
Atrial rate/rhythm	Unable to determine
PR interval	Unable to determine
QRS duration	0.06 sec
Identification	Atrial flutter at 88 bpm with ST-segment depression

Let's Dance!

