CARDIAC

Objectives

- Have an understanding of cardiac developmental issues in children
- Define Commotio Cortis
- Understand that pediatric patients compensate to the end then fall off the cliff.

CARDIAC

CARDIOPULMONARY ASSESSMENT

- As the kids grow up cardiac issues may present
- They are predominantly arrhythmias.
- Ischemia is not one of them!

CONGENITAL CAUSES

CONGENITAL

- Tetrology of Fallot
- Brugada’s Syndrome
- Prolonged QT

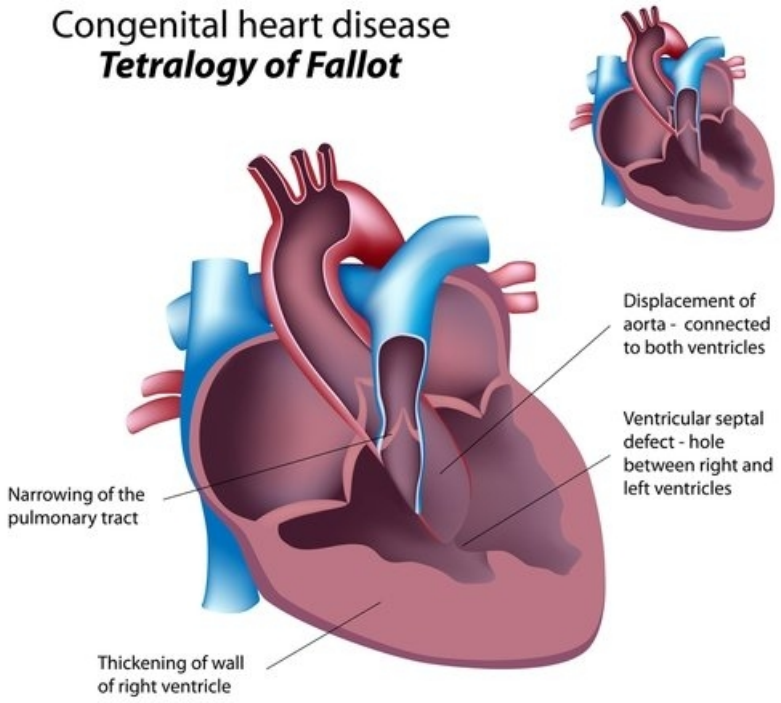
TETROLOGY OF FALLOT

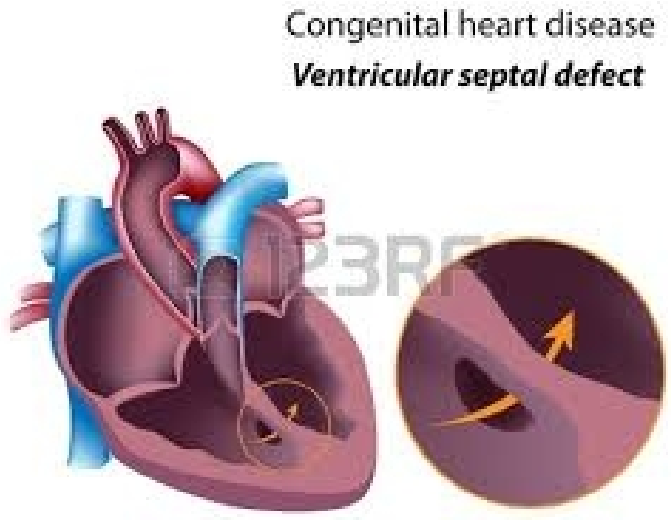
CONGENITAL HEART DEFECT

- Large Ventricular Septal Defect (VSD)
- Pulmonary Stenosis
- Right Ventricular Hypertrophy
- An overriding aorta

Due to mixing of the blood, cyanosis at birth is the hallmark finding.

TETROLOGY OF FALLOT

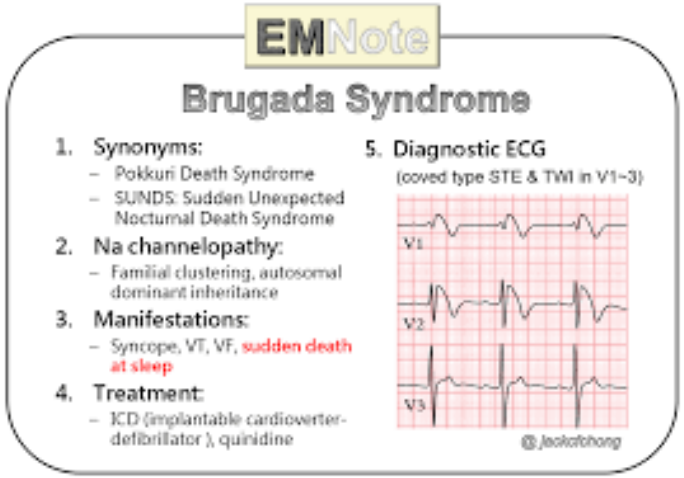


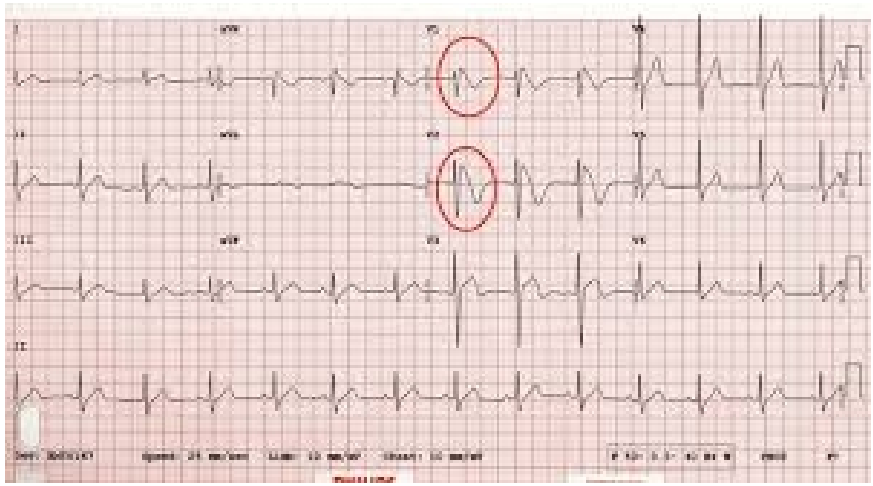


BRUGADA’S SYNDROME

- Heriditary conduction abnormality.
- Symptoms include syncope, palpitations and sudden cardiac death.
- Not usually manifested until 30’s and 40’s.
- More common in men and in Asians.

BRUGADA'S SYNDROME





CARDIAC

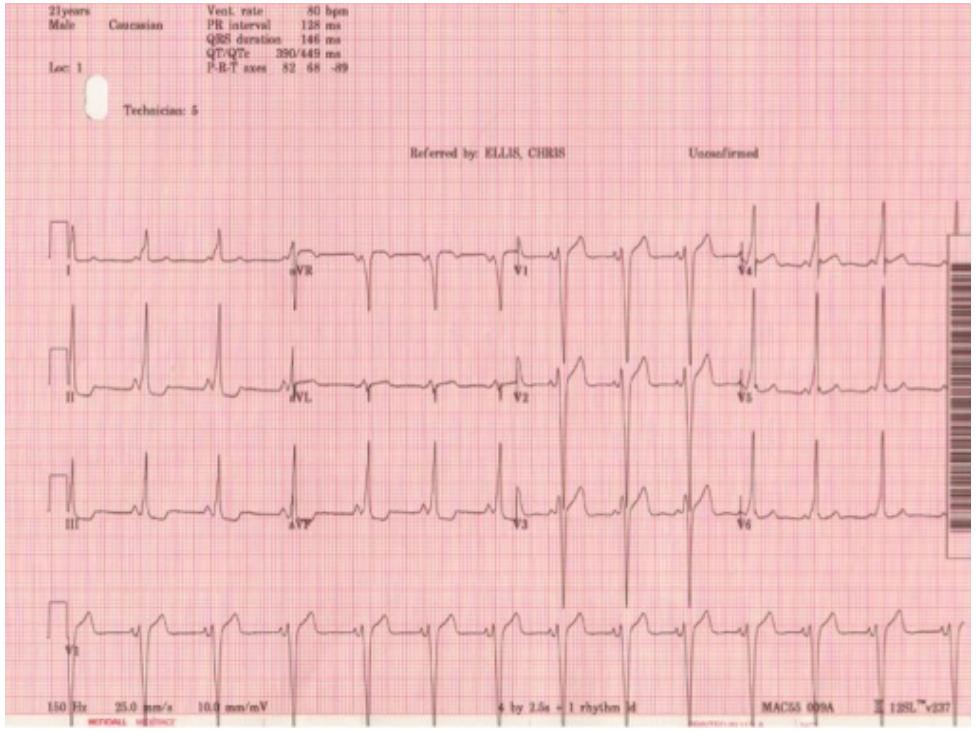
DEVELOPMENTAL

- WPW/SVT’s
- Idiopathic Hypertrophic Cardiomyopathy
- Cardiomyopathy

WOLFF-PARKINSON-WHITE SYNDROME
WPW

- Congenital SVT with abnormal conductive tissue between the atria and ventricle
- Can be seen in infants and older children

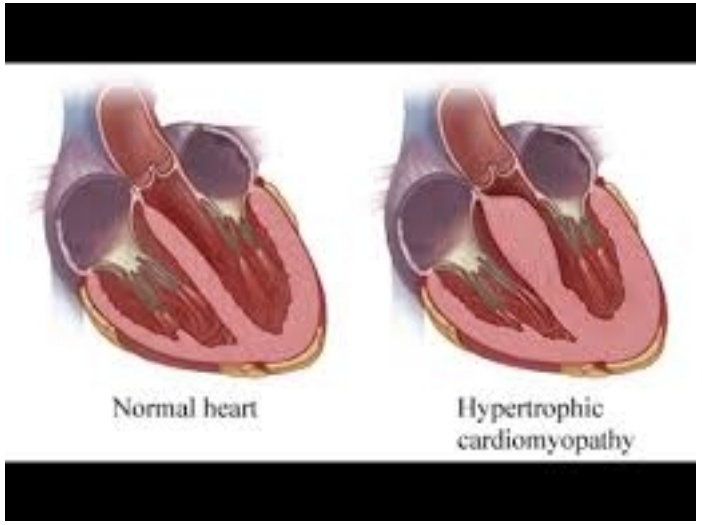
WOLFF-PARKINSON-WHITE SYNDROME
WPW



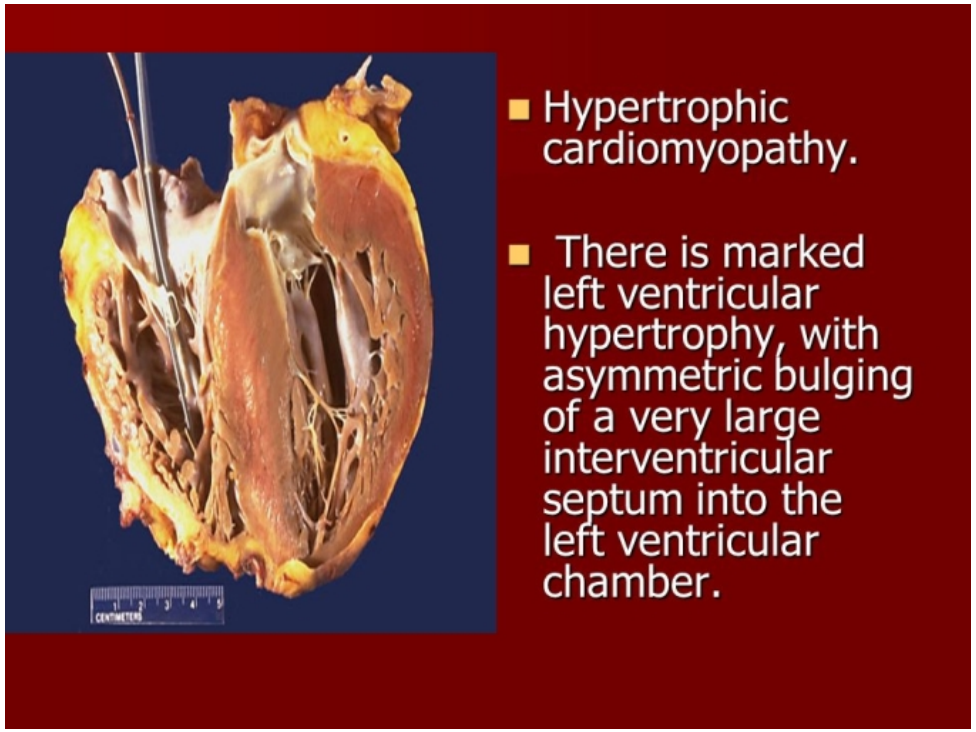
Note the short PR Interval and Delta Wave

- Idiopathic Hypertrophic Cardiomyopathies.
- Dilated Cardiomyopathies.
- Restrictive Cardiomyopathies.

Normal Heart vs Cadiomyopathy



Hypertrophic Cardiomyopathy



CARDIOMYOPATHY

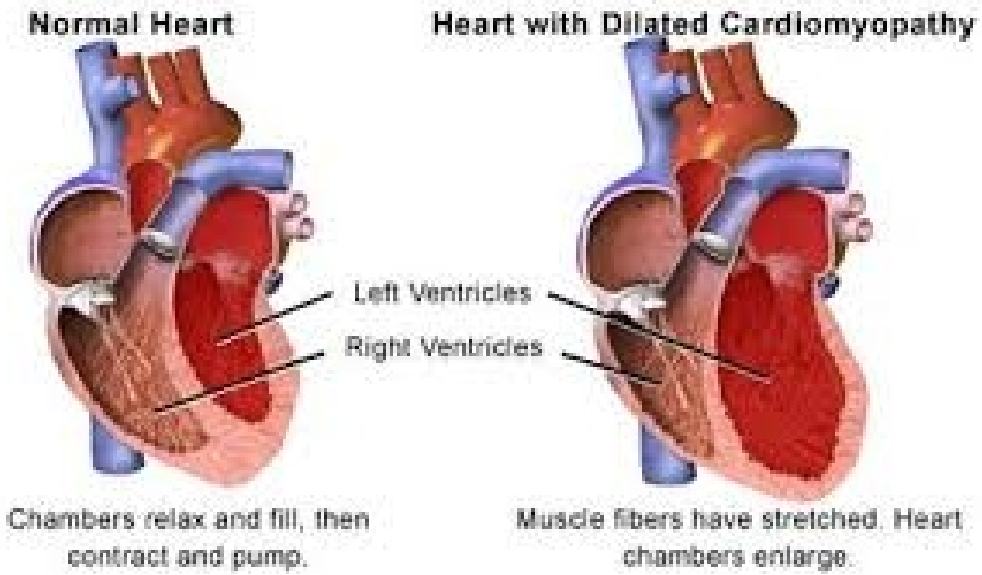
DILATED CARDIOMYOPATHY

* Most common cause; 55%-60% of all childhood Cardiomyopathies.

* Can have genetic, infectious and environmental causes.

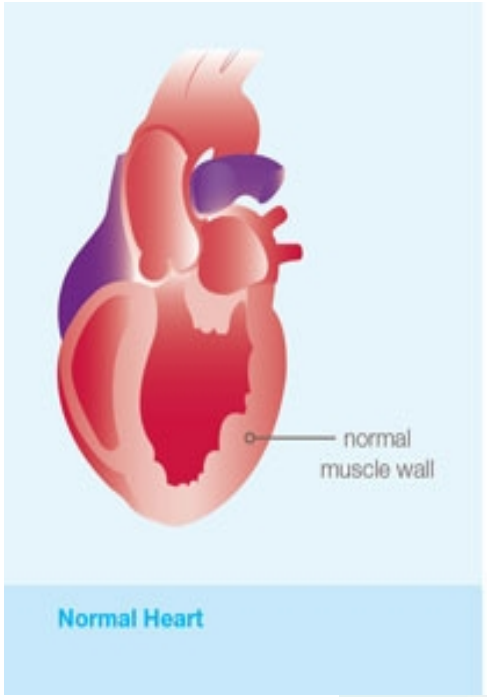
* HEART DILATES LOSING IT'S ABILITY TO CONTRACT.

DILATED CARDIOMYOPATHY

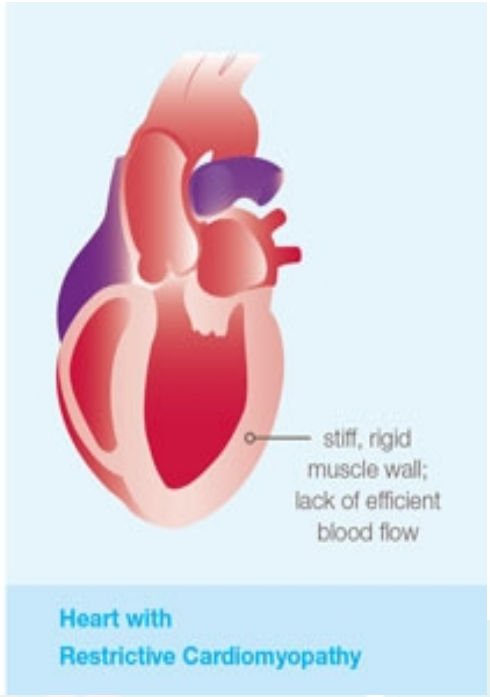


RESTRICTIVE CARDIOMYOPATHY

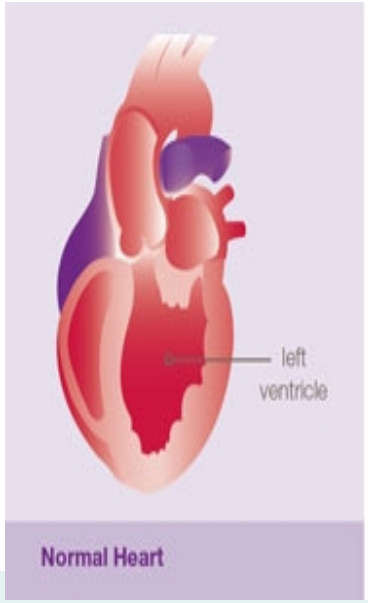
- Heart muscle is normal when contracting (squeezing).
- Heart muscle does not relax during the filling stage preventing blood from flowing into the ventricles.
- Causes “back up”.
- Rare and more prevalent in girls and thought to be genetic.



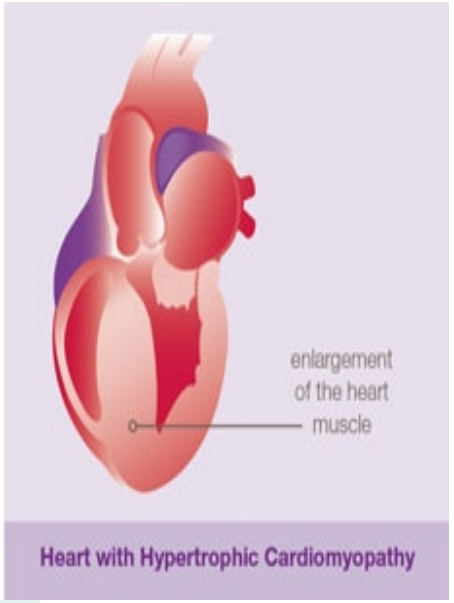
Normal Heart



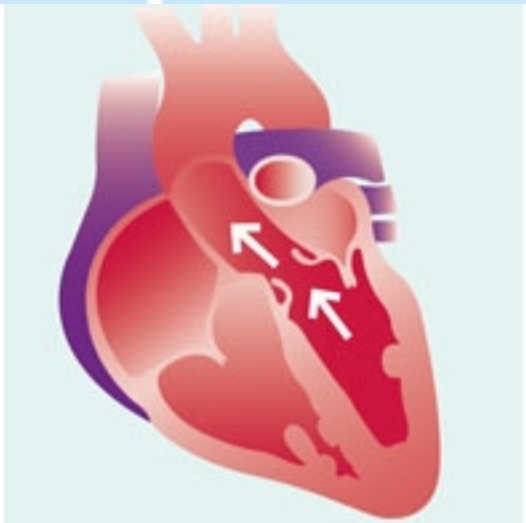
Heart with
Restrictive Cardiomyopathy



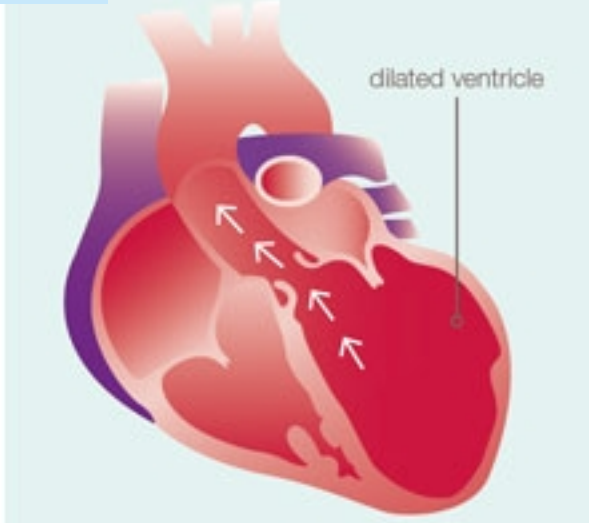
Normal Heart



Heart with Hypertrophic Cardiomyopathy



Normal Heart



Heart with
Dilated Cardiomyopathy

CARDIAC

- Accidental
  - Commotio Cordis
  - Drugs

COMMOTIO CORDIS

- Typically involves a hit to the chest over the precordium and left ventricle.
- Force of impact has less to do with in than hitting “just at the right time” during cardiac cycle.
- Causes primarily V-Tach but sometimes 3rd degree block.

CARDIAC ARRHYTHMIAS

- Defined as
  - Bradyarrhythmias
  - Tachyarrhythmias
  - Pulseless arrest

BRADYARRHYTHMIAS

- Defined as
  - Slow heart rate based on normal rate for age.
  - Primary Bradycardia: Due to congenital or acquired heart conditions.
  - Secondary Bradycardia: Due to underlying conditions such as hypoxia, sepsis, acidosis, hypotension, drugs…

BRADYARRHYTHMIAS

BRADYARRHYTHMIAS ARE FREQUENTLY **PREARREST RHYTHMNS** IN CHILDREN AND **OFTENTIMES DUE TO HYPOXIA**

TACHYARRHYTHMIAS

- Abnormally rapid rates that originate in the atria or the ventricles
- Certain arrhythmias such as SVT’s and Ventricular Tachycardia can lead to shock and death.

TACHYARRHYTHMIAS

SVT

- Heart rate :
  - Infants greater than 220
  - Children greater than 180
- P waves are abnormal or hidden: NOT SINUS
- PR interval may be absent or short
- R-R interval is constant
- Complex's are usually narrow.
- SVT with aberrency

PEDIATRIC RESUSCITATION

PEDIATRIC ASSESSMENT

PRIMARY ASSESSMENT

- Rapid assessment:
  - Respiratory
  - Cardiac
  - Neurologic

  - **A**irway
  - **B**reathing
  - **C**irculation
  - **AVPU** - **A**lert **V**oice **P**ain **U**nresponsive

PEDIATRIC ASSESSMENT

CARDIOPULMONARY ASSESSMENT

- In infants and children cardiopulmonary collapse is due primarily to:
  - Respiratory failure
  - Shock

PEDIATRIC RESUSCITATION

- Often delayed due to inexperience of recognizing the severity.
- Don’t want to “torture” the kid.

Kids Have The Propensity To Compensate To The End And Then Fall Off The Edge



PEDIATRIC RESUSCITATION

- Be aggressive but appropriate
- Always expect the worse but hope for the best
- Have a cheat sheet or Broselow tape