EKG of the WEEK
Questions
A one month old with some symptoms and physical signs compatible with cardiac disease (tachypnea, FTT and loud P2). The child was born to a 42 years old mother and was also noticed to have increased nuchal translucency on a routine nuchal scan performed at 13 weeks gestation.

1. The first question was to identify the rhythm and the anomalies on the EKG.

2. Name the most likely cardiac malformation associating these clinical and EKG findings.
8 year old boy was brought to ER for chest pain. He has mild developmental delay and ADHD and is on Concerta. He feels the pain mostly at night when he goes to sleep.

1. What is the rhythm?
   1. Sinus arrhythmia
   2. Junctional extrasystole
   3. Premature atrial contractions
   4. Premature ventricular contractions
   5. Second degree AV block Mobitz 1 (Wenckebach)
This baby was brought directly from the delivery room to the NICU due to increased HR noticed immediately after delivery. The baby is alert, crying, breathing spontaneously with good respiratory effort. The HR is 210/min. An UVC is put in place.

1. List at least 2 possible causes for this rhythm and describe how you would differentiate between them.
1. Jervell Lange-Nielsen
2. Second degree AV block Mobitz 1
3. Sinus rhythm
4. Complete atrio-ventricular dissociation
5. Sinus arrhythmia
6. Second degree AV block Mobitz 2
7. Third degree AV block - VH pacemaker

1. Match the numbers on the diagrams above with the letters of the tracings.
1. Before you begin the test, please identify yourself with one of the following groups

1. CHEO
2. DGP McMaster
3. Sickkids
4. MacPeds

A one month old boy is brought by his parents to the ER for runny nose, tachypnea and decreased feeding. On exam the baby is alert, afebrile, respiratory rate is 80/min with mild-moderate respiratory distress, arterial saturation are 85%. The precordium is active, 2/6 systolic murmur is heard on auscultation, the liver in normal in size and the peripheral pulses are equally palpated throughout. CBC shows hemoglobin 140 g/l. An EKG and a CXR are done.
2. Enumerate the anomalies encountered on the EKG. What is the rhythm?

3. Considering the findings listed above, should the baby have central cyanosis?
   1. Yes
   2. No

4. What is the most likely cardiac lesion in this child?
   1. Tetralogy of Fallot
   2. Tricuspid atresia
   3. Large VSD
   4. AVSD+TGA
   5. Ebstein anomaly

Done

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1. Before you begin the test, please identify yourself with one of the following groups
   1. CHEO
   2. DGP McMaster
   3. Sickkids
   4. MacPeds

4 year old girl comes to the ER after an episode of seizures lasting for about 1 minute occurring during a febrile illness. This is her third episode of this kind, only this time she complained of chest pain before losing consciousness. On admission her temperature is 38.5 C, she is confused, irritable, mildly tachycardic, but otherwise her vitals are reassuring. The physical examination reveals a 2/6 mid-systolic vibratory murmur at the LLSB, the rest of the cardiovascular examination is normal. You order an EKG and a CXR to rule-out heart disease.

2. What does the EKG and the clinical assessment suggest?
   1. Possible ASD.
   2. Brugada.
   3. Complete RBBB.
3. What are the (2-3) supporting arguments for your choice?

5. Pericarditis.
7. Febrile seizures + innocent heart murmur
8. Mitral valve regurgitation, possible endocarditis

EKG 7
1. Please start by choosing your appropriate affiliation from the list below.

1. CHEO
2. DGP McMaster
3. Sickkids
4. MacPeds

A 5 year old girl was brought to the pediatrician’s office by her mother because of coughing during exercise for the past 3 weeks that was now interfering with her sporting activities. On examination the child looked normally developed and in no distress. There was no tachypnea, the chest was clear on auscultation with good air entry bilaterally and no adventitious sounds. The PMI was palpated in the 5th intercostal space lateral to the MCL, the precordium was active, a 2/6 pansystolic murmur radiating to the axila could be heard at the apex. The pediatrician performs an EKG and a CXR.

CXR AP
2. What is the rhythm? Enumerate the anomalies encountered on this EKG.
3. **What is the most likely scenario in this child?**

1. VSD, heart failure, sinus tachycardia
2. Chronic aortic valve regurgitation, secondary heart failure, sinus tachycardia
3. Dilated cardiomyopathy, heart failure, secondary mitral valve regurgitation, sinus tachycardia
4. Tachycardia-induced cardiomyopathy, heart failure, secondary mitral valve regurgitation
5. Exercise-induced asthma, innocent heart murmur, sinus tachycardia
1. Please start by choosing your appropriate affiliation from the list below.
   1. CHEO
   2. DGP McMaster
   3. Sickkids
   4. MacPeds

A 6 year old boy was brought to the ER by his mother for a recurrent episode of wheezing.
On examination the child looked normally developed, t = 38°C, the RR was about 35/min with moderate respiratory distress, HR = 110/min,
SpO2= 90% in room air, warm and well perfused, BP= 105/68 mmHg.
On auscultation there were diffuse wheezes and crackles bilaterally.
The precordium was quiet, PMI in the 5th i.c. space on left mid clavicular line, S1 and S2 were normal but the cardiac auscultation was difficult
due to the respiratory noises. The liver was firm and palpated at 2 cm below the right costal margin on the mid clavicular line.
The child received Salbutamol nebulizations, 2 L/min O2 by nasal prongs and Tylenol for fever after which the SpO2 increased to 95% and RR
decreased to 25/min.
Later the child fell asleep and you repeated the cardiac exam. The cardiac rhythm was irregular, a variable split of the S2 and a 2/6 mid systolic
vibratory murmur at the LLSB could be heard. You explained to the mother the findings and your decision to perform an EKG to help you in the
differential diagnosis.

2. The mother was anxious because nobody has told her before that the child had anything wrong with his heart.
   What do you tell the mother after reviewing the EKG?
   (from the corresponding columns choose one or more EKG and one or more Clinical findings that you would include in you answer)
EKG Findings
1. PACs due to Salbutamol nebulizations
2. Second degree AV block Mobitz 1 during sleep
3. Sinus arrhythmia
4. Possible RV hypertrophy (positive T in V2 before 8 years of age)

Clinical findings
1. CHF
2. Still's murmur
3. Tricuspid valve regurgitation
4. VSD


4. What would be your management plan?
   1. Reassure
   2. Refer to cardiologist
   3. Order echo
1. Please start by choosing your appropriate affiliation from the list below.
   1. CHEO
   2. DGP McMaster
   3. Sickkids
   4. MacPeds
   Other (please specify)

This 12 year old is brought to the pediatrician’s office for repeated headaches. On exam you notice that his BP was above the 95% for age and height on two consecutive measurements. The nurse performs a 12 lead EKG.

2. What is your decision based on the above findings?
   1. The clinical and EKG findings suggest the child may have persistent hypertension
   2. The EKG is normal, the child may have "white coat" hypertension
   3. You would repeat the EKG as it is suboptimal
1. Please start by choosing your appropriate affiliation from the list below.
   1. CHEO
   2. DGP McMaster
   3. Sickkids
   4. MacPeds
   Other (please specify)

Term baby noticed to have an irregular heart rhythm on routine physical examination before hospital discharge. A 12 lead EKG is done as part of the initial investigation.

2. What is the rhythm?
   1. Sinus arrhythmia
   2. Second degree AV block Mobitz 1 (Wenkebach)
   3. Atrial trigeminy
   4. Atrial Fibrilation
   4. Ventricular bigeminy
1. Please start by choosing your appropriate affiliation from the list below.

1. CHEO
2. DGP McMaster
3. Sickkids
4. MacPeds

Other (please specify)

16 old previously healthy female comes to the emergency room 5 days after delivering a term baby with chest pain and shortness of breath.
Past medical history is significant for Kawasaki disease in childhood.

*2. What is the most concerning finding on this EKG?
3. In the clinical context described above, this EKG is compatible with which of the following:

1. Pulmonary embolism
2. Congestive heart failure
3. Myocardial ischemia
4. Cardiac tamponade
5. All of the above
4 months old with ALTE

1. What is the diagnosis?
   1. Left ventricular hypertrophy
   2. Left bundle branch block
   3. Premature atrial contractions
   4. Accelerated idioventricular rhythm
   5. Premature ventricular contractions
1. Please start by choosing your appropriate affiliation from the list below.

1. CHEO
2. DGP McMaster
3. Sickkids
4. MacPeds
Other (please specify)

2. What cardiac malformation does this EKG best correlate with?

1. ASD
2. Pulmonary valve stenosis
3. VSD
4. AVSD
5. Coarctation of the aorta
1. Please start by choosing your appropriate affiliation from the list below.

1. CHEO
2. DGP McMaster
3. Sickkids
4. MacPeds
Other (please specify)

2. What is the cause of this boys' irregular heart rhythm?

1. Blocked PACs
2. Wenckebach
3. Frequent PACs
4. Polymorphic PVCs
5. Sinus arrhythmia

3. Why does the QRS morphology vary?
1. Please start by choosing your appropriate affiliation from the list below.
   1. CHEO
   2. DGP McMaster
   3. Sickkids
   4. MacPeds
   5. Gomoiu
   6. IOMC
   7. Other
   Other (please specify)

2. The EKG was performed to clarify a rhythm irregularity seen on the monitor in this newborn.
   What abnormality do you see on this rhythm strip?
   1. Blocked PACs
   2. Artefacts
   3. Frequent PACs
   4. Interpolated PVCs
   5. Sinus arrhythmia
3. Justify your answer to the previous question
1. Please start by choosing your appropriate affiliation from the list below.

1. CHEO
2. DGP McMaster
3. SickKids
4. MacPeds
5. Gomoiu
6. IOMC
7. Other

Other (please specify)

2. 12 year old asian boy was brought to the ER by parents with chest pain. What does the EKG show?

1. Inferior myocardial infarction
2. LVH
3. Left bundle branch block
4. WPW
5. Left anterior hemiblock

3. What technical issue is there on this EKG?
4. If this child would complain of frequently recurring chest pain accompanied by chest pounding and lightheadedness, particularly associated with exercise, what test would be most likely to discover something abnormal?

1. Echocardiogram
2. CT angio
3. Angiogram
4. Holter

Other (please specify)
1. Please start by choosing your affiliation from the list below.

1. CHEO
2. DGP McMaster
3. Sickkids
4. MacPeds
5. Gomoiu
6. IOMC
7. Other

Other (please specify)

2. 2 year old boy comes to the Emergency Department for minor chest trauma.

The child was examined and an EKG was performed. He was in no distress, there was no obvious bruising on his chest and no pain on gentle pressure. The precordium was quiet and the point of maximum impulse was in the 4th intercostal space on the left mid clavicular line. S1 was normal, S2 was variably split and there was a 2/6 mid-systolic vibratory murmur at the left lower border. The
Diastole was quiet.
The rest of the physical exam was normal.
The family history was reassuring and the past medical history unremarkable.

What does the EKG show?

3. What would you decide next?
   1. Discharge the child
   2. Order an echocardiogram
   3. Repeat the EKG
   4. Admit the child
   5. Order cardiac enzymes

4. Questions or comments related to this quiz?