Q.1 A 3-year-old boy had total correction of Tetrology of Fallots. He had complete heart block for 5 post operative days then reverted to sinus rhythm and ECG before discharge shows axis of +20 and RBBB. After 4 weeks child came to emergency department with history of recurrent fits for last three days. On examination child was neurologically normal. ECG had same findings.

a) Why this child had fits?
b) How will you manage this patient?
c) What has been missed in this child?

Q.2 Six month old boy presented with history of feeding difficulty, fast breathing and failure to thrive. On examination he weighs 3kg, heart rate 127/min, respiratory rate 52/min and pink in air. Cardiovascular examination shows high volume pulses, prominent precardium apex beat at 6th intercostal space outside midclavicular line. On auscultation, S1 and S2 normal and to and fro murmur of grade 4/6 at LUSB. Respiratory system examination shows mild subcostal retractions otherwise lungs are clear. Liver is palpable 4 cm below right coastal margins. Mother is carrying an Echocardiography, documenting severe aortic regurgitation.

a) Give differential diagnosis.
b) How will confirm your diagnosis, give findings?
c) What is the management?

Q.3 A 9-year-old male child, diagnosed previously as a case of congenital heart disease, presented with bleeding from mouth for last 6 hours. On examination, he is conscious, clubbed and cyanosed. His heart rate is 113/min, respiratory rate 38/min and BP 110/73 mmHg. Mouth is blood stained. Auscultation of cardiovascular revealed S1 normal, single S2 diminished and continuous grade 2/6 murmur at LUSB and back

a) What is the most likely clinical diagnosis?
b) Why this patient is having this presentation?
c) How will you manage this patient?
d) What will be long term management?
Q.4 You have an emergency call from a neonatal unit for a baby who is 6 days old and presented with poor feeding and pale color and breathing difficulty. On examination, he is listless, respiratory rate 77/min, heart rate 168/min, weak pulses. Cardiovascular examination shows gallop rhythm and no murmur. Lungs on auscultation were clear, and liver is palpable 4 cm below right costal margins.

a) What is the differential diagnosis?
b) How will you manage?
c) What will be the treatment?

Q.5 A 6-year-old boy who had Mitral Atresia ASD, VSD, complete transposed great vessels and pulmonary atresia, had bidirectional Glenn operation at age one and half years. Now he has planned for Fontan operation. Name three important investigations will you do to decide for suitability for Fontan and describe what information will you obtain from each investigation and how?

Q.6 A 19-year-old girl presented with history of fever for 10 days followed by breathlessness for one month, then she developed black discoloration of big and second toe of right side with pain. On examination, right radial pulse was weak but left was good volume. Femoral pulses were weak. Blood pressure in left upper limb was 190/110. Echocardiogram shows enlarged LV with reduced function with EF of 40% and except moderate mitral regurgitation there was no other significant finding. Peripheral Doppler did not show any evidence of obstruction in Femoral arteries

a) What is the diagnosis?
b) How will you confirm it?
c) What other investigations will you do?
d) How will you manage this?
Q.7 A 10-year-old boy who has severe Pulmonary hypertension and in functional class II had cardiac catheterization to evaluate the pulmonary vascular resistance and to determine any cardiac lesion if any. Following is the data:

<table>
<thead>
<tr>
<th>Site</th>
<th>O₂ Saturation (%)</th>
<th>Pressure (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVC</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>RA</td>
<td>68</td>
<td>a=6, V=10, mean=7</td>
</tr>
<tr>
<td>RV</td>
<td>72</td>
<td>90/6</td>
</tr>
<tr>
<td>RPA</td>
<td>70</td>
<td>86/50, mean 35</td>
</tr>
<tr>
<td>LPA</td>
<td>75</td>
<td>86/50, mean 35</td>
</tr>
<tr>
<td>Left Pulmonary vein wedge</td>
<td></td>
<td>20/10, mean 14</td>
</tr>
<tr>
<td>Rt Pulmonary vein wedge</td>
<td></td>
<td>80/60, mean 40</td>
</tr>
<tr>
<td>LA</td>
<td>99</td>
<td>a=10, V=6, mean 8</td>
</tr>
<tr>
<td>LV</td>
<td>99</td>
<td>100/8</td>
</tr>
</tbody>
</table>

a) What is the diagnosis, explain?
b) What are the treatment options?
c) What complication can arise if left untreated?

Q.8 Write short notes on:

a) Kawashima operation
b) Damus Kaye Stansel operation

Q.9 A 20-day-old baby boy weighing 2.2 kg has presented with feeding difficulty and breathlessness and blue discoloration. On examination there is cyanosis respiratory rate 80/min. heart rate 156/min. Echo by technician shows Situs solitus Atioventricular and ventriculoatrial concordance, small ASD with R-L shunt, gradient across RVOT 30 mmHg. Gradient across Tricuspid valve is 70 mmHg and Chest X-ray shows normal CT ratio with increased vascularity

a) What are the differential diagnoses on the basis of initial information?
b) What further information will you look in echo cardiography? For each differential diagnosis.
Q.10 A 15-year-old boy who presented with breathlessness on exertion and cyanosis, Echocardiogram shows Situs solitus Atrioventricular and ventriculoatrial concordance. Small ASD with R-L shunt, gradient across tricuspid valve 120 mmHg. Right ventricle enlarged with dysfunction, Gradient across pulmonary valve 150 mmHg. He underwent successful pulmonary valvoplasty oxygen Saturation improved from 80% to 95%, shifted to ICU. After half hour saturation dropped to 60 % and started haemoptysis.

a) Why this patient had this problem?
b) How will you manage this?
c) Could you prevent this?
Q.11 One month old boy presented in OPD with history of blue discoloration since birth and intermittent fits with loss of consciousness for last 15 days. Antenatal and postnatal periods were uneventful. On examination his vital signs are stable; O₂ saturation in air is 60%. Cardiovascular examination shows good volume pulses, normal precordium, S1 and S2 normal a grade 3/6 systolic murmur well localized at LUSB. EGG shows sinus rhythm, right axis deviation, tall R waves in V1 and V2 and upright T waves in right sided chest leads.

a) What is the diagnosis?
b) How it will be confirmed and what findings will you get?
c) What is the treatment?

Q.12 A 14-year-old boy weighing thirty five Kg reported with fever for 2 weeks, treated by GP, looks unwell. He was operated for Coarctation of Aorta at one year of age. He lost to follow up for last 6 years. Chest X-ray shows mediastinal widening.

a) What is the diagnosis?
b) How will you investigate this child?

Q.13 A 19-year-old boy had Fontan operation at age 8 years for Tricuspid Atresia, ASD, VSD, normally related great vessels with pulmonary stenosis. He was doing well. But for last one year has progressive dyspnea, and now has developed facial puffiness and pedal edema

a) What could be the possible reasons for his symptoms?
b) How will you investigate?
c) How will you manage?

Q.14 A 10-year-old girl presented with history of easy fatigability and dyspnea for last 2 years which is increasing and oedema and abdominal distension. On examination child is thin built, pulses are low volume, JVP raised with prominent x and y descent. Liver is palpable 5 cm below the costal margin. On auscultation S1 and S2 normal, chest X-ray shows normal CT ratio.

a) Give your differential diagnosis.
b) How will you differentiate on the basis of echocardiogram?
Q.15 A newborn was found to have moderate cyanosis after 4 hrs of birth. The respiratory rate was 40/mm, heart rate 135/mm and precordial examination showed a pansystolic murmur of 2/6 intensity. Chest X-ray showed massive Cardiomegaly and oligemic lung fields. Blood gas analysis showed a pH=7.35, PO₂=45mmHg, PCO₂=40 mmHg, HCO₃=16 mEq/L.

a) What is the most probable diagnosis?
b) How would you judge the severity of the disease?
c) What would be the management plans, short term and long term?

Q.16 A 15-year-old girl brought to ER department for abnormal behaviour and clumsiness. She has been studying in 9th class. On examination, she has erythematous rash on trunk, temp 99°F, and BP 100/87 mm of Hg, cannot sit still. When asked to walk, keeps on falling. Her speech is slurred. The mother is begging you to protect her from father as village mosque caretaker has declared GIN on her.

a) What is most likely diagnosis?
b) How would you confirm your suspicion?
c) How would you treat?
d) Is her disease transmissible?

Q.17 What are the side effects, contraindications of following drugs and how will you monitor?

a) Bosentan
b) Amiodarone

c) How would you confirm the diagnosis?
d) Enumerate three differential diagnoses?
Q.19 A 12 years old girl presented with breathlessness on mild exertion. She went for Cardiac Catheterization. Below is given cath. data:

<table>
<thead>
<tr>
<th>Site</th>
<th>Saturation (%)</th>
<th>Pressures(mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVC</td>
<td>50</td>
<td>a=10, v=18, mean 14</td>
</tr>
<tr>
<td>RA</td>
<td>55</td>
<td>60/8</td>
</tr>
<tr>
<td>RV</td>
<td>55</td>
<td>60/45 mean 55</td>
</tr>
<tr>
<td>PA</td>
<td>56</td>
<td>70/10</td>
</tr>
<tr>
<td>LV</td>
<td>88</td>
<td>70/50 mean 60</td>
</tr>
<tr>
<td>AO</td>
<td>85</td>
<td>mean 30</td>
</tr>
<tr>
<td>Pulmonary artery wedge pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right pulmonary vein</td>
<td>85</td>
<td></td>
</tr>
</tbody>
</table>

a) What are the haemodynamics abnormalities and why?
b) What is your Diagnosis?
c) What important information would you like to take for deciding treatment options?
d) What are the treatment options?

Q.20 A three years old child with cyanotic heart disease underwent cardiac catheterization. Following is the cardiac cauterization data. Oxygen consumption assumed is 180ml/min/m² and Oxygen carrying capacity 22ml/dl.

<table>
<thead>
<tr>
<th>Site</th>
<th>Oxygen content (ml/dL)</th>
<th>Pressure (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVC</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>RA</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>RV</td>
<td>13</td>
<td>90/12</td>
</tr>
<tr>
<td>PA</td>
<td>16.5</td>
<td>60/35, mean 45</td>
</tr>
<tr>
<td>AO</td>
<td>14</td>
<td>88/60, mean 70</td>
</tr>
<tr>
<td>RUPV</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>LV</td>
<td>17.5</td>
<td>65/8</td>
</tr>
</tbody>
</table>

a) What is the lesion?
b) Calculate the R-L and L-R shunts.

The End