Embryology

بسم الله الرحمن الرحيم

DOPAMINE SCIENTIFIC TEAM

Final | Lectures 1-4

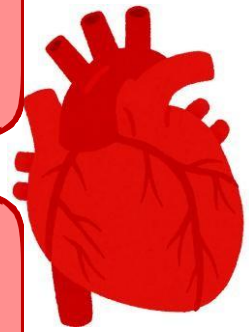
وَلَقَدْ خَلَقْنَا الْإِنسَانَ وَنَعْلَمُ مَا تُوَسْوِسُ بِهِ نَفْسُهُ ۖ وَنَحْنُ أَقْرَبُ إِلَيْهِ مِنْ حَبْلِ الْوَرِيدِ

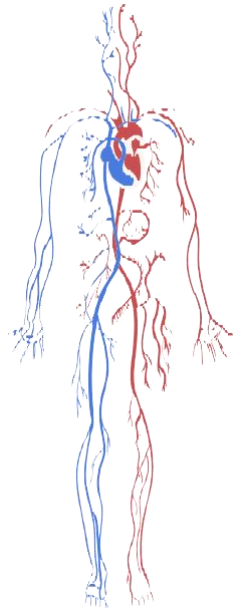
اللهم إنّا نعوذ بك من شرور أنفسنا ومن سيئات أعمالنا

Past Papers

Written by: Mazen nashash, Abdallah Alrawwash

Reviewed by: Yazan Aldebei, Mahmoud alabsi





Heart Development

(L2-3)

Q1:Which one of the following is NOT related to the septum primum?

a. Floor of fossa ovalis
b. Valve of foramen ovale
c. Foramen primum
d. Foramen secundum
e. Annulus ovalis

Answer: e

Q2: An infant initially has a left-to-right shunt, but after a few years the shunt reverses to right-to-left. What is the most likely defect?

(a) Dextrocardia
(b) Pulmonary stenosis
(c) Big ventricular septal defect
(d) Small ventricular septal defect
(e) Tricuspid atresia

Answer: C

Q3: Which of the following defects is wrong about Fallot tetralogy?

A .Ventricular septal defect
b. Pulmonary stenosis
c. Left ventricle hypertrophy
d. Overriding of the aorta

Answer:c

Q:yb demrof si silavo assof fo evlaV :4

a. Septum secundum
b. Cranial end of septum primum
c. Sinus venosus
d. Septum spurium

Answer: B

Q5: Which of the following is CORRECT regarding atrial septation?

a. Foramen primum forms part of septum secundum
b. Fossa ovalis belongs to septum secundum
c. Foramen secundum develops when foramen primum closes
d. Annulus ovalis is part of septum primum
e. Valve of foramen ovale comes from septum secundum

Answer: C

Q6: All of the following are true, EXCEPT:

a. Ventricular septal defect → non-cyanotic
b. Premature closure of foramen ovale → left ventricular hypertrophy
c. Atrial septal defect → non-cyanotic
d. Patent ductus arteriosus → left-to-right shunt
e. Coarctation of the aorta → weak femoral pulse

Answer:b

Q7: The abnormality that causes right ventricular hypertrophy is:

a. Great vessel transposition
b. Fallot's tetralogy
c. Patent ductus arteriosus
d. Atrial septal defect

Answer: b

Q8:-3 year-old boy presents with cyanosis and shortness of breath that develops when he plays with friends. According to his mother, the boy was born cyanotic. The boy is very small and short for his age, and he squats on the floor next to his mother. Chest radiography reveals a boot-shaped heart, normal heart size, and a right aortic arch. Echocardiography reveals a large ventricular septal defect with an overriding aorta, pulmonary stenosis, and right ventricular hypertrophy. Which of the following is the most likely diagnosis?

a. Coarctation of the aorta
b. Patent ductus arteriosus
c. Rheumatic heart disease
d. Tetralogy of Fallote.

Answer: d

Q9:A straight (non-spiral) course of the aortico-pulmonary septum will result in which condition?

A. Tetralogy of Fallot
B. Persistent truncus arteriosus
C. Transposition of the great arteries
D. Patent ductus arteriosus
E. Double aortic arch

Answer: C

e-Some other pressure

10- The following congenital heart diseases are acyanotic *EXCEPT*:

a-Atrial septal defect

b-Aortic coarctation

c-Patent ductus arteriosus

d-Fallot's tetrad

e-Ventricular septal defect

Answer:

Q11: What structure contributes to formation of the smooth part of the right atrium?

A .Primitive atrium
b. Right horn of sinus venosus
c. Septum primum
d. Crista terminalis

Answer: B

Q12: Wrong about the development of the heart:

a. Smooth part of right ventricle is derived from conus cordis
b. Interventricular septum grows upward toward endocardial cushions
c. Primitive atrium forms the trabeculated parts of both atria
d. Sinus venosus contributes to the smooth part of the right atrium
e. The smooth part of both ventricles is derived from the distal part of bulbus cordis

Answer: e

Q13:Failure of the aortico-pulmonary septum to form leads to which congenital heart defect?

A. Tetralogy of Fallot
B. Persistent truncus arteriosus
C. Transposition of the great arteries
D. Coarctation of the aorta
E. Dextrocardia

Answer: B

Q14:Which of the following congenital heart defects are correctly associated with marked cyanosis?

A. Secundum-type atrial septal defect
B. Ventricular septal defect (isolated)
C. Tetralogy of Fallot
D. Tricuspid atresia
E. C+D

Answer: E

Q15: The smooth posterior wall of the left atrium is formed by:

a. Sinus venosus
b. Absorption of pulmonary veins
c. Septum primum
d. Septum secundum
e. Primitive atrium

Answer: b

Q16:The following are conditions with congenital heart disease presenting with cyanosis from the start EXCEPT:

a. Fallot’s tetrad
b. Tricuspid atresia
c. Truncus arteriosus
d. Transposition of great arteries
e. Ventricular septal defect (VSD)

Answer: e

Q17: INCORRECT STATEMENT about the connection between the atria:

a. Foramen ovale is open during fetal life
b. Mixing occurs between the atria before birth
c. Septum primum forms the valve of foramen ovale
d. The connection between the LA and RA closes just before birth
e. Foramen ovale functionally closes after birth

Answer:D

Q:18Which is wrong regarding the annulus fibrosus?

a. It surrounds the atrioventricular openings
b. It provides attachment for the cardiac valves
c. It electrically insulates atria from ventricles
d. It is formed by dense connective tissue
e. It is formed by the septum primum

Answer: E

Q19: Which of the following statements about the development of the heart is WRONG?

A .The smooth part of the right ventricle (conus arteriosus) is derived from the bulbus cordis.
B .The muscular part of the interventricular septum grows upward toward the endocardial cushions.
C .The smooth part of the left ventricle (aortic vestibule) is derived from the distal bulbus cordis.
D .The primitive atrium gives rise to the rough trabeculated parts of both atria.
E .The sinus venosus contributes to the smooth part of the right atrium (sinus venarum).

Answer: C

Q20: In a newborn with transposition of the great vessels, which associated defect allows mixing and survival?

a. Atrial septal defect (ASD)
b. Ventricular septal defect (VSD)
c. Patent ductus arteriosus (PDA)
d. All of the above

Answer: d

Arteries & Veins Development

(L1,4)

Q1:Which of the following is NOT related to the development of the right vitelline vein?

a. Hepatic sinusoids
b. Hepatocardiac portion of the inferior vena cava
c. Splenic vein
d. Superior mesenteric vein
e. Anterior cardinal vein

Answer: e

Q:2Choose the WRONG match

a. Right umbilical vein – ligamentum teres hepatis
b. Septum spurium – fusion of cranial end of right and left venous valves of the sinoatrial valve
c. Ductus venosus – ligamentum venosu
d. Ductus arteriosus – ligamentum arteriosume.
e.The umbilical arteries – medial umbilical ligaments

Answer: a

Q:3Wrong about fetal circulation:

A.Foramen ovale allows RA → LA flow
B.Ductus arteriosus shunts PA → aorta
C.Umbilical vein carries deoxygenated blood
D.all are correct

Answer: C

Q:4The last event in conversion of fetal to adult circulation:

A. Closure of foramen ovale
B. Closure of umbilical vein
C. Closure of ductus venosus
D. Closure of ductus arteriosus
E. Closure of umbilical arteries

Answer: d

Q :5In transposition of the great arteries, what allows the newborn to stay alive?

a. Closure of ductus arteriosus
b. Aortic stenosis
c. Pulmonary vein anomaly
d. Patent ductus arteriosus
e. Thickened mitral valve

Answer: d

Q :6Low femoral pulse/pressure is most suggestive of:

a. Tetralogy of Fallot
b. Persistent truncus arteriosus
c. Atrial septal defect
d. Coarctation of the aorta
e. Transposition of the great vessels

Answer: d

Q:7Which of the following statements about the ductus arteriosus is TRUE?

a. It carries blood from the aorta to the pulmonary veins
b. It remains open throughout adult life
c. It connects the right ventricle directly to the aorta
d. It allows blood to pass from the pulmonary artery to the aorta before birth
e. It increases systemic vascular resistance in the fetus

Answer: d

Q:8INCORRECT STATEMENT about the ductus venosus:

a. It carries oxygenated blood toward the IVC
b. It bypasses the hepatic sinusoids
c. It becomes the ligamentum venosum after birth
d. It connects the umbilical vein to the IVC
e. It connects the right umbilical vein to the left vitelline vein

Answer: e

Q 9INCORRECT STATEMENT about fetal shunt closure:

a. Ductus arteriosus closes after birth
b. Foramen ovale functionally closes after birth
c. Left umbilical vein closes after birth
d. All fetal shunts close immediately at birth
e. Umbilical arteries constrict after birth

Answer: d

Q:10Wrong statement about fetal circulation:

a. Ductus venosus shunts oxygenated blood to the IVC
b. Foramen ovale directs blood from RA to LA
c. Umbilical vein carries oxygenated blood
d. Ductus arteriosus sends poorly oxygenated blood to the lower half of the body
e. Most fetal blood bypasses the lungs

Answer: d

Q:11Which is wrong regarding the pulmonary trunk?

a. Pulmonary trunk is initially anterior then to the left of the ascending aorta
b. Pulmonary trunk carries deoxygenated blood
c. Pulmonary trunk arises from the right ventricle
d. Pulmonary trunk bifurcates into right and left pulmonary arteries
e. Pulmonary trunk is initially anterior then to the right of the ascending aorta

Answer: e

Q12:Which structure is derived from the left horn of the aortic sac ?

A. Right subclavian artery
B. Brachiocephalic artery
C. Proximal part of the arch of aorta
D. External carotid artery
E. Right pulmonary artery

Answer: C

Q13: Wrong statement about coarctation of the aorta:

a. Blood pressure in the upper limbs is higher than in the lower limbs
b. Collateral circulation develops through intercostal arteries
c. Rib notching may appear due to enlarged intercostal arteries
d. Femoral pulse is weak compared to radial pulse
e. Pressure in the pulmonary trunk and aortic arch becomes equal

Answer:e

Q14:Which event does NOT occur at or shortly after birth?
a. Functional closure of foramen ovale
b. Increased systemic vascular resistance
c. Increased pulmonary blood flow
d. Constriction of umbilical arteries
e. Decrease in systemic vascular resistance

Explanation: After umbilical cord clamping, systemic vascular resistance increases, helping blood flow toward the lungs.

Answer: e

Q15:The embryonic origin of the left subclavian artery is:

a. 7th intersegmental artery
b. Common dorsal aorta
c. Third aortic arch
d. Fourth aortic arch
e. Ventral aorta

Answer: a

Q16:Which of the following is the origin of the IVC hepatic segment?

a. Right subcardinal vein
b. Left vitelline vein
c. Right vitelline vein
d. Posterior cardinal vein
e. Common cardinal vein

Answer: c

Q17:Which of the following forms the IVC valve in the right atrium?

a. Cranial part of sinoatrial right valve
b. Caudal part of sinoatrial right valve
c. Septum spurium
d. Septum secundum

Answer: b

Q:18A baby has bluish lower limbs, normal upper limbs, absent femoral pulse, and rib notching on X-ray. The diagnosis is:

a. Coarctation of the aorta
b. Fallot's tetralogy
c.a+b

Answer: a

Q33 – Which of the following forms the renal part of the IVC?

a. Subcardinal vein
b. Supracardinal vein
c. Sacrocardinal vein
d. Vitelline vein
e. Common cardinal vein

Answer: a

Q:19The congenital anomaly that allows blood to pass from pulmonary artery to the aorta is:

a. Patent ductus arteriosus
b. Atrial septal defect
c. Ventricular septal defect
d. Truncus arteriosus
e. Transposition of great arteries

Answer: a

Q20:Ductus arteriosus is derived from:

a. Left distal 6th aortic arch
b. Right distal 6th aortic arch
c. Left 4th aortic arch
d. Right 4th aortic arch
e. Dorsal aorta

Answer: a

Q:21 Fourth left aortic arch forms:

a. Middle aortic arch
b. Brachiocephalic trunk
c. Right subclavian artery
d. Pulmonary trunk
e. Ductus arteriosus

Answer: a

Q22:Right supracardinal vein forms:

a. Azygos vein
b. Hemiazygos vein
c. Inferior vena cava
d. Portal vein
e. Common cardinal vein

Answer: a

Q23: Diminished blood pressure in lower extremities is due to:

a. Coarctation of the aorta
b. Patent ductus arteriosus
c. Atrial septal defect
d. Total anomalous pulmonary venous return
e. Pulmonary stenosis

Answer: a

Test bank Qs

Q1:A newborn presents with severe cyanosis immediately after birth. Echocardiography shows the aorta arising from the right ventricle and the pulmonary trunk from the left ventricle. Which embryological error best explains this condition?

A) Failure of aortico-pulmonary septum formation

B) Anterior displacement of the septum

C) Straight course of the aortico-pulmonary septum

D) Persistence of truncus arteriosus

E) Defective neural crest migration

Answer:c

Q:2Which part of the Bulbus cordis forms the outflow tracts of both ventricles?

A) Truncus arteriosus

B) Conus cordis

C) Sinus venosus

D) Aortic sac

E) Dorsal aorta

Answer: B

Q:3The aortico-pulmonary septum is completely formed during which embryonic week?

A) 3rd week

B) 4th week

C) 5th week

D) 8th week

Answer:D

Q4: .25The foramen ovale allows blood to pass from

a) Right atrium to left atrium
b) Left atrium to right atrium
c) Right ventricle to left ventricle
d) Left ventricle to aorta

Answer: a

Q :5In Tetralogy of Fallot, the aortico-pulmonary septum is shifted?

a) Posteriorly
b) Anteriorly
c) To the right
d) To the left

Answer:b

Q:6 The anterior cardinal veins drain blood from:

a. Lower limbs

b. Abdomen

c. Head and neck

d. Yolk sac

Answer: c

Q:7 The left 4th aortic arch gives rise to:

a. Right subclavian artery

b. Arch of aorta

c. Ductus arteriosus

d. Pulmonary trunk

Answer:b

Q:8The arch of the aorta is derived from all of the following EXCEPT:

a. Left horn of aortic sac

b. Left 4th aortic arch

c. Left dorsal aorta

d. Right 4th aortic arch

Answer: d

Q:9A newborn undergoes echocardiography for suspected congenital heart disease. Imaging shows that the apex of the heart points to the right, but the liver is in its normal position on the right, and the stomach bubble remains on the left. No systemic venous anomalies are detected, and the great vessels follow their usual left–right arrangement. Which is the most likely diagnosis?

a. Situs inversus totalis
b. Persistent truncus arteriosus
c. Transposition of the great arteries
d. Dextrocardia
e. Right-sided aortic arch

.

Answer: D

Q:9 Failure of the left anterior cardinal vein to regress will result in:

a. Right-sided superior vena cava

b. Absence of superior vena cava

c. Interrupted IVC

d. Double superior vena cava

e. Left brachiocephalic vein enlargement

Answer: d

Q:10Failure of the right anterior cardinal vein to develop normally while the left anterior cardinal vein persists will result in:

a. Absence of IVC

b. Left superior vena cava

c. Double aortic arch

d. Interrupted aortic arch

e. Persistent truncus arteriosus

Answer: b

Q11 – A defect in the 7th intersegmental artery on the left side would impair development of:

a. Superior mesenteric artery
b. Left subclavian artery
c. Right common carotid
d. Middle aortic arch
e. Inferior phrenic artery

Answer: b

Q:12The inferior vena cava is derived from all EXCEPT:

a) Right vitelline vein **b) Right subcardinal vein**
c) Right sacrocardinal vein **d) Left umbilical vein**

Answer: d

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