

Maternal & Neonatal

[MF01](#) [a] The hyperventilation of pregnancy is due to:

- A. Progesterone
- B. Decreased resistance
- C. ?
- D. ?

[MF02](#) [a] Normal maternal ABG at term:

- A. pH 7.36, pCO₂ 36 mmHg
- B. pH 7.42, pCO₂ 36 mmHg
- C. pH 7.44, pCO₂ 30 mmHg
- D. ?
- E. pH ? pCO₂ ?

[MF03](#) [cl] MF03 [cl] [Feb11] [Aug11] [Feb12] Closure of the ductus arteriosus occurs due to:

- A. Increased prostaglandins **this maintains patency ∴ avoid NSAIDs in 3rd trimester so not to close DA**
- B. Pressure in left atrium exceeds that in right atrium
- C. Aortic pressure exceeds pulmonary artery pressure **get reverse flow in a PDA situation ie pathological**
- D. Oxygen mediated smooth muscle constriction
- E. Increased systemic vascular resistance

[MF04](#) [cfkmr] With regard to the foetal circulation:

- A. ? Goes into the left atrium
- B. Ductus venosus drains into the IVC directly **placenta > umbilical vein > L branch of hepatic portal vein. 60% of blood from umbilical vein bypasses liver via ductus venosus**
- C. Oxygen saturation is 40% in umbilical vein **80% (content 30)**
- D. Oxygenated blood flows from the SVC through the foramen ovale to the head
- E. Ductus arteriosus directs oxygenated blood to the head - **crista terminalis directs it through foramen ovale to LA**

Apr 2001: With regard to the foetal circulation:

- A. Blood from SVC goes into the left atrium via the ductus arteriosus

- B. Ductus venosus drains into the IVC directly
- C. Oxygen saturation is 40% in umbilical vein
- D. ?

[MF05](#) [diqr] Brown fat:

- A. Produces ATP and Heat
- B. Insulates the great vessels of the neck more gives heat to blood there
- C. Is autonomically mediated SNS
- D. Extramitochondrial uncoupling of oxidative phosphorylation

[MF06](#) [d] Highest O₂ saturation in the foetal circulation is in:

- A. Thoracic IVC 67
- B. Right atrium
- C. Ascending aorta 62
- D. Pulmonary vein 42
- E. Ductus arteriosus 52

[MF06b](#) [o] With regard to fetal circulation:

- A. Fetal umbilical vein has higher PO₂ than maternal vein 30 vs 40
- B. Fetal umbilical vein has higher PO₂ than fetal umbilical artery 30 vs 20
- C. ?

Alt version Jul03: Foetal circulation:

- A. O₂ tension (not saturation) of umbilical artery is lower than in maternal uterine vein. 20 vs 40
- B. Foetal haemoglobin has a lower affinity for O₂ than which increases delivery to foetal tissues.
- C. ?

[MF07](#) [e] Which of the following is immediately due to onset of ventilation in the newly born?

- A. Increased left atrial pressure
- B. Closure of ductus venosus
- C. Decreased RV pressure
- D. ?

- Onset of ventilation in the neonate leads to increased blood flow through the lungs due to
 1. A direct effect of outwards traction on the pulmonary vessels due to lung expansion, (decreased PVR related to lung vol, remember diagram in West) and
 2. A (slightly later) effect of increased oxygenation causing pulmonary vascular dilation (loss of Hypoxic Pulmonary Vasoconstriction),
- Both these factors will cause a decrease in pulmonary vascular resistance and increased blood flow through the lungs. This will have the effect of
 3. Decreasing right ventricular pressure due to decreased right ventricular afterload (option C), and
 4. Increasing left atrial pressure due to increased blood flow from the pulmonary vasculature to the left atrium (option A)

[MF07b](#) [f] Which effect is due to spontaneous ventilation in neonate? (Or: The first breath in a neonate has a predominant role in:)

A. Decreasing RV outflow pressure

B. Closure of ductus venosus

C. Closure of foramen ovale only after clamping of umbilical vessels $\Rightarrow \uparrow$ SVR $\Rightarrow \uparrow$ LVEDP $\Rightarrow \uparrow$ LA pressure \Rightarrow functional closure

D. Increased systemic vascular resistance

E. Increased LV pressure

[MF08](#) [gi] FRC in the neonate:

A. 1 ml/kg

B. 15 ml/kg

C. 30 ml/kg

D. 70 ml/kg

[MF09](#) [g] Foetal circulation:

A. Inferior vena cava blood has high pO₂ because of ductus venosus

B. Inferior vena cava blood enters the head via ductus arteriosus

C. ?

[MF10](#) [hq] The reason for increased aortic pressure after birth:

- A. Removal of placental circulation ie clamping cord
- B. Duct closure
- C. Increased pulmonary flow
- D. ?

[MF11](#) [i] Tidal volume of a neonate:

- A. 1 ml/kg
- B. 3 mls/kg
- C. 7 mls/kg
- D. 15 mls/kg
- E. 30 mls/kg

[MF11b](#) [j] Tidal volume in a 2.3kg neonate:

- A. ?
- B. 10ml
- C. 15ml
- D. 30ml
- E. ?

[MF11c](#) [j] The FVC of a neonate weighing 2.3 kg is: **ForcedVC = VC which is 40ml/kg in neonate**

- A. 100 ml
- B. 150 ml
- C. 200 ml
- D. 250 ml
- E. 300 ml

[MF12](#) The neonate has

- A. Less plasma cholinesterase ~50% levels but still functionally enough
- B. Higher volume of distribution for neuromuscular blockers Muscle relaxants are highly ionised, hence penetrate cell membranes poorly. They are virtually trapped in the ECF, so Vd correlates with ECF. ECF decreases with age.

- C. Higher levels of alpha-1 acid glycoprotein
- D. High levels of cytochrome P450 enzymes

MF13 [j] Maternal-fetal ABO incompatibility is less common than Rhesus incompatibility because:

- A. Fetal antibodies to ABO are less developed
- B. Maternal ABO antibodies do not cross the placenta**
- C. Maternal ABO antigens do not cross the placenta
- D. Fetal ABO antigens are less immunogenic

Alternative recalled options:

- B: Maternal Ab's rarely cross placenta**
- C: Foetal RBC's rarely enter circulation
- D: Foetus have immature ? Ab's/Ag's
- E: Foetus have absent ?Ab's/Ag's

MF14 [kq] With regard to the neonate

- A. Static compliance is greater than adult values **is less**
- B. Dynamic compliance is greater than adult values **less**
- C. Specific compliance is the same as adult values**
- D. Dynamic compliance is the same as adult values
- E. Static compliance is the same as adult values.

Alt version: Comparing the neonate to adult lung

- A Dynamic compliance of the lung is less in the neonate
- B Static compliance of the chest wall is more in the neonate
- C Specific static compliance is about the same**
- D. ?
- E. ?

[MF15](#) [I] (. paO₂ in maternal uterine blood. . .) but foetus can maintain adequate O₂ because:

- A. Large placental surface area
- B. Double Haldane effect CO₂
- C. Foetal haemoglobin
- D. ?
- E. ?

[MF16](#) [m] ("Given a normal set of maternal blood gases at term, asked to comment on results")

At term, maternal paCO₂ is 32-33mmHg due to maternal hyperventilation. This respiratory alkalosis is almost fully compensated so the pH is typically returned to the normal range.

- A. Metabolic alkalosis, abnormal - something wrong going on
- B. ?
- C. Abnormal ABGs, expect lower bicarb (in gas is about 22)
- D. Metabolic alkalosis, normal for pregnant/term mother
- E. ?

[MF17](#) [mpq] Foetal haemoglobin:

- A. All is in the form of HbF
- B. HbO₂ dissociation curve is shifted to the left does not bind 2,3 DPG ∴ greater affinity for O₂ ⇒ L shift curve. HbF p50 18-20 (HbA 26.6)
- C. ?
- D. ?
- E. ?

(Alt: "there was a question on foetal and maternal hemoglobin and the effect of shift of odc "

[MF18](#) [op] The Thermoneutral Zone is best correlated with:

is the range of ENVIRONMENTAL temperatures over which metabolic heat production is minimal (minimal O₂ consumption) and thermoregulation is maintained by vasomotor activity

A. Core temp with no energy consumption

B. Ambient temp in which core temp can be maintained without sweating.

C. Peripheral temperature at which.. ?

D. Core temperature at which... ?

E. ?