



THE COLLEGES OF MEDICINE OF SOUTH AFRICA

Incorporated Association not for gain
Reg No 1955/000003/08

Final Examination for the Fellowship of the
College of Anaesthetists of South Africa

16 March 2010

Paper I

(3 hours)

All questions are to be answered. Each question to be answered in a separate book (or books if more than one is required for the one answer)

Al die vrae moet beantwoord word. Elke vraag moet in 'n aparte boek (of boeke indien meer as een nodig is vir 'n vraag) geskryf word

- 1 Write detailed notes on the complete perioperative management of an acute ascending aorta dissection (including anaesthesia). [100]
- 1 *Skryf gedetailleerde notas oor die volledige perioperatiewe hantering van 'n akute stygende aorta disseksie (narkose ingesluit).* [100]
- 2 A 45-year-old female with a body mass index (BMI) of 32 presents for an elective laparoscopic cholecystectomy
 - a) Describe your pre-operative assessment and recommendations. (30)
 - b) Write short notes about the possible intra- and post-operative complications. (30)
 - c) What anaesthetic technique would you employ? (40)[100]
- 2 *'n Vyf-en-veertigjarige vrou met ligaamsmassa indeks (LMI) van 32 presenteer vir elektiewe laparoskopiese cholesistektomie*
 - a) *Beskryf u pre-operatiewe evaluasie en aanbevelings.* (30)
 - b) *Skryf kort notas oor die moontlike intra- en post-operatiewe komplikasies.* (30)
 - c) *Watter narkosetegniek sal u gebruik?* (40)[100]
- 3 Discuss the management of a 6-year-old HIV positive child, on anti-retroviral therapy, under the following headings
 - a) Potential peri-operative drug interactions.
 - b) The management of pain during the peri-operative period.
 - c) Risks of infection. [100]
- 3 *Bespreek die hantering van 'n 6-jaar-oue MIV positiewe kind, op anti-retrovirale terapie, onder die volgende hoofde*
 - a) *Potensiële peri-operatiewe geneesmiddel interaksies.*

- b) *Die hantering van pyn in die peri-operatiewe periode.*
- c) *Risiko's vir infeksie.*

[100]

- 4 A 40-year-old man is scheduled to have a living donor renal transplant. He has been on haemodialysis for 5-years. Discuss briefly
- a) The more likely possible causes of end-stage renal disease in this patient. (5)
 - b) Common medical problems secondary to end-stage renal disease that may impact on the anaesthetic management of the patient. (20)
 - c) The anaesthetic management and monitoring of the recipient. (40)
 - d) The anaesthetic management and monitoring of the living donor. (20)
 - e) Post-operative pain management in the recipient and donor. (15)
- [100]

- 4 'n 40-Jarige man is geskeduleer om 'n lewende donor nieroorplanting te ondergaan. Hy is al vir 5-jare op hemodialise. Bespreek kortliks
- a) *Die meer waarskynlike moontlike oorsake vir eindstadium nierversaking in hierdie pasiënt.* (5)
 - b) *Algemene mediese probleme sekondêr tot eindstadium nierversaking wat 'n invloed mag hê op die narkosehantering van die pasiënt.* (20)
 - c) *Die narkosehantering en monitering van die ontvanger.* (40)
 - d) *Die narkosehantering en monitering van die lewende skenker.* (20)
 - e) *Post-operatiewe pynhantering by die ontvanger en skenker.* (15)
- [100]



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Paper II

(3 hours)

All questions are to be answered. Each question to be answered in a separate book (or books if more than one is required for the one answer)

Al die vrae moet beantwoord word. Elke vraag moet in 'n aparte boek (of boeke indien meer as een nodig is vir 'n vraag) geskryf word

- 1 Discuss CO₂ under the following headings
- a) Pathophysiological effects of an abnormal pCO₂. (30)
 - b) Useful applications of CO₂ gas in theatre. (20)
 - c) Permissive hypercarbia. (50)
- [100]
- 1 *Bespreek CO₂ onder die volgende hoofde*
- a) *Die patofisiologiese effekte van 'n abnormale pCO₂.* (30)
 - b) *Bruikbare toepassings van CO₂ gas in die teater.* (20)
 - c) *Toegelate hiperkarbie.* (50)
- [100]
- 2
- a) What are the risks involved in performing a lumbar epidural on a labouring parturient, and how can these risks be prevented? (40)
 - b) How may an epidural for labour be converted to anaesthesia for caesarean section? (20)
 - c) Why does central neuraxial anaesthesia sometimes fail to work, and how can this failure be prevented? (40)
- [100]
- 2
- a) *Wat is die risiko's betrokke in die uitvoer van 'n lumbale epiduraal op 'n pasiënt in kraam, en hoe kan hierdie risiko's voorkom word?* (40)
 - b) *Hoe kan 'n epiduraal vir kraam verander word in narkose vir keisersnit?* (20)
 - c) *Hoekom werk sentrale neuraksiale narkose soms nie, en hoe kan hierdie mislukking voorkom word?* (40)
- [100]

- 3 A patient presents to your hospital with 60% lower limb and torso burns. Describe your management of the following
- a) Initial resuscitation. (40)
 - b) Anaesthesia for initial escharotomy. (20)
 - c) Sedation for dressing changes. (20)
 - d) Anaesthesia for skin grafting. (20)
- [100]
- 3 *'n Pasiënt presenteer by jou hospitaal met 60% brandwonde van die onderbene en torso. Beskryf jou hantering van die volgende*
- a) *Aanvanklike resussitasie.* (40)
 - b) *Narkose vir aanvanklike eskarotomie.* (20)
 - c) *Sedasië vir verband omruiling.* (20)
 - d) *Narkose vir veloorplanting.* (20)
- [100]
- 4 Patients with rheumatoid arthritis pose several challenges to the anaesthesiologist. Discuss. [100]
- 4 *Pasiënte met reumatoïede artritis bied verskeie uitdagings aan die anesthesioloog. Bespreek.* [100]



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FCA(SA) Part II

DATA INTERPRETATION – PAPER III

Question 1 - 2

18 MARCH 2010

Time: 3 hours

CANDIDATE NUMBER.....

Question 1 / Vraag 1

A 65-year-old woman is booked for an elective cholecystectomy. On history the patient complains of neck pain that became worse since she had a car accident 4-years ago. On examination she has a limited range of neck movement. The x-ray below (Figure 1) was taken pre-operatively.

'n 65-Jarige vrou is bespreek vir elektiewe cholesistektomie. Sy gee geskiedenis van nekpyn wat erger geword het sedert 'n motorongeluk 4-jaar gelede. By ondersoek het sy 'n beperkte nekbeweging. Die x-straal hieronder (Figuur 1) is pre-operatief geneem.

- a) Describe the findings on the neck x-ray. (2)
Beskryf die bevindings op hierdie x-foto.

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- b) What are the special anaesthetic considerations with regard to the findings on this x-ray? (3)
Wat is die special narkoseoorwegings rakende die x-straal bevindings?

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- c) Would you like further investigations of the neck complaint before the procedure? Why? (2)
Sou u verdere ondersoeke rakende die nek klagte wou hê voor die prosedure? Hoekom?(2)

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- d) If you decide to anaesthetise the patient what would be your anaesthetic technique?
As u besluit om die pasiënt narkose te gee, wat sou u narkosetegniek wees? (3)

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[10]

Question 2 / Vraag 2

A 70-year-old woman has fractured her hip 5-days ago. She presents to theatre for a total hip replacement.

On examination her pulse rate is 95 beats/min. Figure 2 below is the patient's ECG.

'n 70-Jarige vrou het haar heup 5-dae gelede fraktuur. Sy presenteer in teater vir 'n totale heupvervanging.

By ondersoek is haar polstempo 95 slae/ minuut. Figuur 2 hieronder is die pasiënt se EKG.

- a) Interpret the ECG.
Interpreteer die EKG. (6)

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- b) What would be your next investigation and what do you expect to find?
Wat sou u volgende ondersoek wees en wat verwag u om te vind? (4)

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[10]



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FCA(SA) Part II

DATA INTERPRETATION – PAPER III

Question 3 - 5

18 MARCH 2010

Time: 3 hours

CANDIDATE NUMBER.....

Question 3 / Vraag 3

A fifty-year-old patient develops sudden hypotension following manipulation of a long bone fracture under general anaesthesia

'n Vyftigjarige pasiënt ontwikkel skielik hipotensie na manipulasie van 'n langbeen fraktuur onder algemene narkose

a) What are your differential diagnoses of this hypotension?
Wat is u differensiële diagnose van hierdie hipotensie?

- i)
- ii)

½ mark each (total 1 mark)

b) How would your monitoring of this patient help with the diagnosis?
Hoe sou u monitering van hierdie pasiënt help met diagnose?

- i)
- ii)
- iii)
- iv)
- v)

(5)

c) Outline principles of management of this patient's hypotension.
Omlyn beginsels van hantering van hierdie pasiënt se hipotensie

- i)
- ii)
- iii)
- iv)

(4)

[10]

Question 4 / Vraag 4

A 25-year-old para 2 gravida 3 with an atrial septal defect measuring 24 mm, severe pulmonary hypertension, and an ejection fraction of 62% is not cyanosed, nor is she in heart failure. She is scheduled for surgical delivery.

'n 25-Jarige para 2 gravida 3 met atriale septale defek van 24 mm deursnee, erge pulmonale hipertensie, en ejeksiefraksie van 62 % is nie sianoties of in hartversaking nie. Sy is geskeduleer vir chirurgiese verlossing.

a) What problems can you expect during anaesthesia?
Watter probleme kan u verwag tydens narkose? (4)

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b) Outline your anaesthetic plan for this patient.
Omlyn u narkoseplan vir hierdie pasiënt. (6)

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Question 5 / Vraag 5

Outline the electrolyte abnormalities in the following gastro-intestinal tract obstructions
Verskaf die elektrolietafwykings in die volgende gastrointestinale traktus obstruksies

a) Gastric outlet obstruction.
Maaguitgang obstruksie.

- i)
- ii)
- iii)
- iv)
- v)

½ mark each (total 2 ½)

b) Duodenal atresia.
Duodenale atresie.

- i)
- ii)
- iii)
- iv)
- v)

½ mark each (2 ½ marks)

c) Intersusception of the small bowel.
Intussusepsie van die dunderm.

- i)
- ii)
- iii)
- iv)
- v)

½ mark each (total 2 ½ marks)

d) Large bowel volvulus.
Dikderm volvulus.

- i)
- ii)
- iii)
- iv)
- v)

½ mark each (total 2 ½ marks)

[10]



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FCA(SA) Part II

DATA INTERPRETATION – PAPER III

Question 6 - 8

18 MARCH 2010

Time: 3 hours

CANDIDATE NUMBER.....

Question 6 / Vraag 6

The trends of heart rate and blood pressure in Figure 3 were taken from a healthy 30-year-old man who underwent a laparoscopic Nissen fundoplication

Die opname oor tyd van hart-tempo en bloedruk in Figuur 3 is geneem van 'n 30-jarige gesonde man wat 'n Nissen fundoplikasie ondergaan het

- a) Explain the haemodynamic changes seen between the two arrows.
Verduidelik die hemodinamiese veranderinge wat tussen die twee pyltjies plaasvind. (4)

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- b) How would you have responded to these changes?
Hoe sou jy hierdie veranderinge behandel het? (6)

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Question 7/ Vraag 7

A 25-year-old female presents with respiratory distress and a temperature of 39°C. She is intubated in the emergency room and the chest x-ray (Figure 4) is taken

'n 25-Jarige vrou presenteer met respiratorise nood en 'n koors van 39°C. Sy is in die nood-eenheid geintubeer en die bors x-straal (Figuur 4) is geneem

- a) What is the most likely diagnosis?
Wat is die mees waarskynlike diagnose? (2)

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- b) Describe your initial ventilatory management in the intensive care unit.
Beskryf jou aanvanklike ventilatoriese behandeling in die waakeenheid. (8)

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Question 8 / Vraag 8

- a) Describe the feature of note in the flow-time loop below (Figure 5).
Beskryf die kenmerk in die onderstaande vloei-tyd lus (Figuur 5). (4)

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- b) Which three ventilator settings could have been changed to achieve the flow-time loop below (Figure 6)?
Watter drie ventilator stelling mag verander word om die lus onder (figuur 6) te bereik? (6)

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FCA(SA) Part II

DATA INTERPRETATION – PAPER III

Question 9 - 11

18 MARCH 2010

Time: 3 hours

CANDIDATE NUMBER.....

Question 9 / Vraag 9

A 35-year-old man presents with diarrhoea and asthma. Clinical examination reveals facial telangiectasia and a systolic murmur loudest in the left second intercostal space.

'n 35-Jarige man presenteer met diaree en asma. Kliniese ondersoek toon telangiëktase van die gesig en 'n sistoliese geruis, hardste in die linker interkostale spasie.

a) What syndrome should be suspected?
Watter sindroom moet vermoed word? (1)

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b) What tests should be performed to confirm this diagnosis?
Watter toetse behoort gedoen te word om hierdie diagnose te bevestig? (3)

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c) How should this patient be managed in order to prevent the potential adverse effects of this syndrome intraoperatively?
Hoe moet die pasiënt hanteer word ten einde die potensiële newe-effekte van die sindroom intra-operatief te hanteer? (6)

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Question 10 / Vraag 10

The man shown in this drawing (Figure 7) presented with headaches and visual disturbance.
Die man op die skets (Figuur 7) het presenteer met hoofpyn en gesigsteurnis.

- a) What is his most likely medical condition?
Wat is sy mees waarskynlike mediese toestand? (1)

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His pre-operative blood tests were normal. Surgery to treat his condition is performed and post-operatively his blood tests are
Sy pre-operatiewe bloedtoetse was normaal. Chirurgie vir sy toestand word gedoen en post-operatief is sy bloeduitslae

Sodium/ <i>natrium</i>	156 mmol/l
Potassium/ <i>kalium</i>	4.2 mmol/l
Urea/ <i>ureum</i>	9.8 mmol/l
Bicarbonate/ <i>bicarbonaat</i>	28 mmol/l
Plasma osmolality/ <i>plasma osmolaliteit</i>	330/mosmol/kg H ₂ O.

- b) What post-operative complication do you suspect has occurred and how would you treat it?
Watter post-operatiewe komplikasies het plaasgevind en hoe sal u dit behandel? (9)

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Question 11 / Vraag 11

A 76-year-old lady attends the pre-operative anaesthetic clinic. She has been booked for a total hip replacement in two-weeks time. She does not have any cardiac symptoms although she can only walk 10m due to hip pain. This is her ECG (Figure 8)

'n 76-Jarige dame besoek die pre-operatiewe narkosekliniek. Sy is bespreek vir 'n totale heupvervanging binne 2-weke. Sy het geen kardiaale simptome maar kan slegs 10 meter loop weens heupwyn. Hierdie is haar EKG (Figuur 8)

a) What is the abnormality and what are the possible causes?

Wat is die abnormaliteit en wat is die moontlike oorsake?

(4)

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b) How does this affect your peri-operative management of this patient?

Hoe beïnvloed dit u peri-operatiewe hantering van hierdie pasiënt?

(6)

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[10]



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FCA(SA) Part II

DATA INTERPRETATION – PAPER III

Question 12 - 14

18 MARCH 2010

Time: 3 hours

CANDIDATE NUMBER.....

Question 12 / Vraag 12

A surgery intern asks your opinion about a serum potassium of 6.0 mmol/l in a patient booked for anesthesia.

'n Intern by chirurgie vra u opinie oor 'n serum kalium van 6.0 mmol/l in 'n pasiënt wat bespreek word vir narkose.

- a) What other measurement(s) from the blood investigations would you ask about?
Watter ander bloed ondersoek bevinding(e) sou u oor navraag doen? (2)

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- b) List important causes of hyperkalaemia.
Maak 'n lys van die belangrike oorsake van hiperkalemie. (5)

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- c) Describe your immediate treatment of a patient with symptomatic hyperkalaemia.
Beskryf u onmiddellike behandeling van 'n pasiënt met simptomatiese hiperkalemie.(3)

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Question 13 / Vraag 13

You administer heparin 7000 IU intravenously to an adult weighing 70kg for aorta- bifemoral bypass. His activated clotting time after three minutes is 110 seconds. His pre-induction ACT was 100 seconds.

U dien heparien 7000 IE intraveneus toe aan 'n 70kg volwassene wat aorta-bifemorale omleiding ondergaan. Die geaktiveerde stol tyd drie minute later is 110 sekondes. Dit was voor induksie 100 sekondes.

- a) List the causes of apparent heparin resistance. (5)
Lys oorsake van skynbare heparien weerstandigheid.

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- b) Briefly discuss your management. (5)
Beskryf u hantering kortliks.

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Question 14 / Vraag 14

You ventilate a relaxed, intubated child of 30 kg using your anaesthetic ventilator. You have real-time spirometry on your display (Figure 9).

U ventileer 'n geïntubeerde, verslapte kind van 30kg met u narkose ventilator. U narkose monitor het 'n intydse spirometrie vertoon (Figuur 9).

- a) Comment on the spirometry curve. (2)
Lewer kommentaar op die spirometrie kurwe.

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- b) What causes would you consider? (3)
Watter oorsake sal u in ag neem?

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- c) What are the risks to the patient? (3)
Wat is die gevare vir die pasiënt?

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- d) In the absence of other reversible causes, how would you adjust your ventilator? (2)
Hoe sal u die ventilator verstel nadat u ander omkeerbare oorsake uitgeskakel het?

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FCA(SA) Part II

DATA INTERPRETATION

Question 15 - 17

18 MARCH 2010

Time: 3 hours

CANDIDATE NUMBER.....

Question 15 / Vraag 15

A 55-year-old woman is brought to the casualty unit by ambulance. She is semi-comatose and ill for several days and has a past history of heart failure. Current medication is digoxin and a thiazide diuretic. An arterial blood gas is obtained whilst breathing room air

'n 55-jarige vrou word per ambulans ingebring na die ongevalle-eenheid. Sy is semi-komateus, siek vir verskeie dae en het ook 'n geskiedenis van hartversaking. Huidige medikasie is digoksien en 'n tiasied-diuretikum. 'n Arteriële bloedgas word gedoen op kamerlug

pH = 7.41
PCO₂ = 32 mmHg
PO₂ = 85 mmHg
HCO₃⁻ = 19 mmol/l
Anion gap = 33 mmol/l
S-glucose = 67 mmol/l
S-K⁺ = 2.7 mmol/l

- a) Give 2 likely causes for the abnormal anion gap. (2)
Gee 2 waarskynlike oorsake vir die abnormale anioongaping.

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- b) A pre-existing high S-HCO₃⁻ is likely. Explain why? Calculate the likely pre-existing S-HCO₃⁻. Show your calculations. (4)
'n Voorafgaande hoë S-HCO₃⁻ is waarskynlik. Verduidelik hoekom? Bereken die waarskynlike voorafgaande S-HCO₃⁻. Wys u berekeninge.

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- c) What is the expected PaCO₂ for a chronic S-HCO₃⁻ = 19 mmol/l? (2)
Wat is die verwagte PaCO₂ vir 'n chroniese S-HCO₃⁻ = 19 mmol/l?

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- d) What conclusion can be drawn from your finding in (c)?
Watter gevolgtrekking kan gemaak word uit u bevinding in (c)? (2)

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Question 16 / Vraag 16

A nerve stimulator is applied over the ulnar nerve on the forearm of a patient with post-operative apnoea. The motor function of the adductor pollicis is monitored. Draw the motor response of this muscle schematically as found in the following possible scenarios

'n Senuweestimulator word geplaas oor die ulnare senuwee in die voorarm van 'n pasiënt met post-operatiewe apnee. Die motorfunksie van die adduktor pollicis word gemoniteer. Teken skematies die motorrespons van hierdie spier soos gevind met die volgende moontlike scenario's

- a) A partial depolarising block when using a tetanic stimulus.
'n Gedeeltelike depolariserende blok wanneer 'n tetaniëse stimulus toegedien word. (2)

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- b) A partial nondepolarising block when using a train-of-four stimulation.
'n Gedeeltelike nie-depolariserende blok wanneer 'n rits-van-vier stimulasies gebruik word. (2)

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- c) Testing for posttetanic facilitation in the presence of a complete depolarising block.
Toets vir posttetaniëse potensiasie in die aanwesigheid van 'n volledige depolariserende blok. (2)

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- d) Testing for posttetanic facilitation in the presence of a partial nondepolarising block.
Toets vir posttetaniese potensiasie in die teenwoordigheid van 'n gedeeltelike nie-depolariserende blok. (2)

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- e) Applying a tetanic stimulus in the absence of a neuromuscular block in a man with myasthenic syndrome.
Toediening van 'n tetaniese stimulus in die afwesigheid van 'n neuromuskulêre blok by 'n man met miasteniese sindroom. (2)

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[10]

Question 17 / Vraag 17

- a) A neonate is breathing spontaneously with a fast respiratory rate utilising the Jackson-Rees system. The fresh gas flow is 5 litres per minute. The capnograph side stream aspiration tube is connected to the paediatric airway filter on to the distal end of the endotracheal tube.

'n Neonaat haal spontaan asem met 'n Jackson-Reessisteem teen 'n vinnige respiratoriese tempo. Die varsgasvloeï is 5 liter per minuut. Die kapnograaf-systroomaspirasiepypie is gekonnekteer aan die pediatriese lugwegfilter aan die distale einde van die endotracheale buis.

- i) Identify two seemingly obvious abnormalities identifiable from the capnogram tracing in Figure 10.
Identifiseer twee oënskynlik duidelike abnormaliteite identifiseerbaar op die kapnogramuitdruk in Figuur 10 (1)

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- ii) Describe the interpretational difficulties associated with a capnogram lacking a plateau phase.
Beskryf die interpretasieprobleme geassosieer met 'n kapnogram sonder 'n platofase. (2)

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iii) Describe the interpretational difficulties associated with a capnogram at such a fast respiratory rate.

Beskryf die interpretasieprobleme geassosieer met 'n kapnogram waar die respiratoriese tempo so vinnig is. (2)

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b) Volume control ventilation is applied in an adequately paralyzed young female during a laparotomy for a ruptured ectopic pregnancy. The tidal volume is 400 ml and the ventilatory rate is 12 per minute. Her blood pressure is 65/35 when an arterial bloodgas determination is done. The PaCO₂ is 68 mmHg although the ETCO₂ recording at the moment of blood sampling read 48 mmHg.

Volume-beheerventilasie word toegepas gedurende 'n laparotomie vir 'n geruptuurde ektopiese swangerskap by 'n voldoende verslakte jong vrou. Die getyvolumie is 400 ml en die ventilatoriese tempo is 12 per minuut. Haar bloeddruk is 65/35 wanneer 'n arteriële bloedgasanalise gedoen word. Die PaCO₂ is 68 mmHg alhoewel die ETCO₂-lesing op die oomblik van die bloedmonsterneming 48 mmHg was.

i) What PaCO₂-ETCO₂ gradient is considered to be acceptable during ideal physiological circumstances?

Watter PaCO₂-ETCO₂-gradiënt word as aanvaarbaar beskou gedurende idiale fisiologies omstandighede? (1)

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ii) Explain the possible cause of the abnormal PaCO₂-ETCO₂ gradient in the mentioned patient.

Verduidelik die moontlike oorsaak van die abnormale PaCO₂-ETCO₂-gradiënt in die genoemde geval. (2)

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iii) Under which unique circumstance can the PaCO₂-ETCO₂ gradient be reversed for a limited period (negative gradient, not necessarily related to the above case)?

Onder watter unieke omstandighede kan die PaCO₂-ETCO₂-gradiënt omgekeerd wees vir 'n beperkte periode (negatiewe gradient, nie noodwendig verwant aan bogenoemde pasiënt nie)?

(1)

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iv) Explain briefly how significant hypercarbia can contribute towards tissue hypoxia in this clinical scenario.

Verduidelik kortliks hoe betekenisvolle hiperkarbie in hierdie scenario kan bydra tot weefselhipoksie. (1)

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