EDX.MED12 Anaesthetics and Antiseptics: Simpson, Lister and Safer Surgery

Total Marks

EDEXCEL 1HI0 · Calculators not allowed · about 65 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Write in full sentences for Questions 13 and 14. You are advised to spend about 65 minutes on this pack.

1 Give the year James Young Simpson discovered chloroform could be used as an anaesthetic.

(Total for Question 1 is 1 mark)

2 Name the substance Joseph Lister promoted in the 1860s to reduce wound infection in surgery.

(Total for Question 2 is 1 mark)

3 State two reasons why some doctors and members of the public were initially worried about using chloroform.

(Total for Question 3 is 2 marks)

4 Give the name of the hospital where Joseph Lister began applying carbolic acid dressings in surgery in the 1860s.

(Total for Question 4 is 1 mark)

5 Name the earlier scientist whose work on microbes Lister used to justify antiseptic surgery.

(Total for Question 5 is 1 mark)

6 State one way the introduction of anaesthetics changed surgery in the nineteenth century.

(Total for Question 6 is 2 marks)

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7 Give the name of a woman who died after receiving chloroform in 1848, an event often mentioned in histories of early anaesthesia.

(Total for Question 7 is 1 mark)

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8 State two elements of Lister's antiseptic practice in the 1860s.

(Total for Question 8 is 2 marks)

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9 Name one immediate effect Lister's antiseptic methods had on patients after surgery.

(Total for Question 9 is 1 mark)

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10 State one reason why some doctors at first resisted Lister's antiseptic methods.

(Total for Question 10 is 2 marks)

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11 Give one long-term impact of the combined development of anaesthetics and antiseptics on surgery.

(Total for Question 11 is 1 mark)

12 Explain one way in which the development of anaesthetics in the mid nineteenth century was similar to the development of antiseptic surgery later in the century.

(Total for Question 12 is 4 marks)

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13 Explain why surgical practice changed so much in Britain between about 1840 and 1880.

You may use the following in your answer:
- James Simpson and the introduction of chloroform as an anaesthetic in the 1840s
- Joseph Lister and the introduction of carbolic antisepsis in the 1860s

You must also use information of your own.

(Total for Question 13 is 12 marks)

14 'Without anaesthetics and antiseptics surgery could not have developed into modern safe practice.' How far do you agree? Explain your answer.

(Total for Question 14 is 16 marks)

Mark scheme · EDX.MED12 Anaesthetics and Antiseptics: Simpson, Lister and Safer Surgery

Question 1

- **B1** 1847
- **Answer: 1847**

Question 2

- **B1** carbolic acid (phenol)
- **Answer: Carbolic acid (phenol)**

Question 3

- **B1** fear that chloroform might be dangerous and could cause sudden death
- **B1** religious objections that argued relieving pain interfered with divine providence
- **Answer: Doctors and the public feared chloroform could be dangerous and cause sudden death, and some objected on religious grounds that it interfered with God-given pain.**

Question 4

- **B1** Glasgow Royal Infirmary
- **Answer: Glasgow Royal Infirmary**

Question 5

- **B1** Louis Pasteur
- **Answer: Louis Pasteur**

Question 6

- **B1** allowed surgeons to perform longer and more complex operations without the patient feeling pain
- **B1** supporting detail, e.g. operations that had been impossible because of patient pain became practicable
- **Answer: Anaesthetics allowed longer, more complex operations without pain, so surgeons could attempt procedures previously impossible because patients could not bear them.**

Question 7

- **B1** Hannah Greener
- **Answer: Hannah Greener**

Question 8

- **B1** rinsing wounds and instruments with carbolic acid
- **B1** using carbolic-soaked dressings to protect wounds after surgery
- **Answer: Rinsing wounds and instruments with carbolic acid, and using carbolic-soaked dressings to cover wounds.**

Question 9

- **B1** reduced post-operative infection (fewer cases of gangrene or sepsis)
- **Answer: A reduction in post-operative infection, such as fewer cases of gangrene or sepsis.**

Question 10

- **B1** some surgeons were sceptical of the new germ ideas and thought infection was due to bad air or patient weakness
- **B1** supporting detail, e.g. using carbolic was seen as messy and time-consuming and some feared it would damage living tissue
- **Answer: Doctors resisted because they rejected germ-based explanations of infection and because carbolic procedures were seen as messy, time-consuming and possibly harmful to tissue.**

Question 11

- **B1** made major and complex surgery routinely possible and much safer, reducing mortality rates
- **Answer: They made major and complex surgery routinely possible and much safer, reducing surgical mortality rates.**

Question 12

- **B2** identifies one clear similarity, for example that both depended on scientific discoveries which changed practice, and explains it with supporting detail
- **B2** supporting detail showing the similarity, e.g. both used a new scientific idea to transform surgery: chloroform applied chemistry/physiology to relieve pain, and Lister applied Pasteur's microbial ideas to prevent infection
- **Answer: Both developments transformed surgery by applying a new scientific idea to solve a specific problem: chloroform anaesthesia applied chemistry and physiology to remove the pain of operations, while Lister's carbolic antisepsis applied Pasteur's germ theory to prevent wound infection, so each used scientific discovery to make operations safer and more widely acceptable.**

Question 13

- **Level 1** (1-3): Identifies one or two simple reasons for change in surgical practice with little or no supporting detail or explanation.
- **Level 2** (4-6): Offers some explanation of reasons for change, with relevant detail, but the answer is limited in development or balance.
- **Level 3** (7-9): Explains a range of reasons for the changes in surgical practice with accurate detail and begins to show how the reasons connect or the consequences they produced.
- **Level 4** (10-12): Provides a well-developed explanation of why surgical practice changed, supported throughout by precise, accurate detail and showing clear links between causes and consequences.
- **Indicative content:**
  - The arrival of anaesthetics, such as chloroform from 1847, removed the barrier of patient pain and allowed longer and more daring operations, which encouraged surgeons to develop new techniques and reshaped the scope of surgery.
  - Lister's antiseptic methods from the 1860s, building on Pasteur's germ theory, reduced deadly wound infections and therefore lowered mortality, making operations less risky and so more acceptable to both surgeons and patients.
  - Technological and scientific advances, including improved surgical instruments and better understanding of anatomy, supported more precise operations once pain and infection were addressed.
  - The professionalisation of surgery, with better training, hospital organisation and a growing medical press, helped spread new practices such as anaesthesia and antisepsis more quickly among practitioners.
  - Public and institutional pressure, including demand from patients and support from some hospital administrators, encouraged adoption of safer techniques; high-profile failures and debates also pushed reform.
  - The interplay of factors mattered: anaesthesia created the opportunity for more complex surgery, while antisepsis made those operations survivable, so both developments together led to the sharp change in surgical practice between c1840 and c1880.

Question 14

- **Level 1** (1-4): Shows limited knowledge and offers a simple, unbalanced judgement on the statement with little supporting evidence.
- **Level 2** (5-8): Shows some relevant knowledge and begins to weigh factors for and against the statement, but the argument lacks depth or balance.
- **Level 3** (9-12): Shows good knowledge and offers a balanced evaluation of the importance of anaesthetics and antiseptics, supported by accurate evidence and some analysis.
- **Level 4** (13-16): Shows precise, well-selected knowledge and offers a sustained, balanced judgement on how far the statement is accurate, explaining the roles of anaesthetics and antiseptics and considering other contributing factors.
- **Indicative content:**
  - Support for the statement: anaesthetics such as chloroform removed the barrier of pain, allowing longer, more complex operations and the development of new surgical techniques; without anaesthesia surgery would remain limited.
  - Support for the statement: antiseptics introduced by Lister reduced post-operative infection and death, transforming operations from often fatal procedures into survivable ones and so enabling the growth of modern surgery.
  - Qualification or challenge: other factors were also essential, such as improvements in surgical instruments, better training and professionalisation of surgeons, and changes in hospital organisation and nursing, which together with anaesthetics and antiseptics enabled safer practice.
  - Qualification or challenge: advances in diagnostics, anaesthetic technique refinement, and later developments in aseptic technique and sterilisation also contributed; early anaesthetics and antiseptics were important but not the only necessary elements.
  - Balanced judgement: while anaesthetics and antiseptics were crucial and foundational, they worked in combination with other scientific, institutional and technological changes; the development of modern safe surgery was a multi-causal process in which anaesthesia and antisepsis were leading but not solitary factors.