1.16 The Role of Science, Technology and Communication in Medical Change: 30-minute Pack

EDEXCEL 1HI0 · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. You are advised to spend about 30 minutes on this pack.

1 Give the name of the seventeenth-century observer who used early microscopes to describe tiny organisms and is often cited for early microbial observation.

(Total for Question 1 is 1 mark)

2 Explain why advances in technology have been important for medical change across c1250-present.

You may use the following in your answer:
- the printing press and the spread of anatomical knowledge in the Renaissance
- microscopes and the ability to observe microbes in the seventeenth century

You must also use information of your own.

(Total for Question 2 is 12 marks)

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3 'Communication networks were as important as new technologies in producing medical change.' How far do you agree? Explain your answer.

You may use the following in your answer:
- the printing press and learned journals as channels for sharing discoveries
- modern digital communication, databases and international collaboration in projects such as the Human Genome Project

You must also use information of your own.

(Total for Question 3 is 16 marks)

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Mark scheme · 1.16 The Role of Science, Technology and Communication in Medical Change: 30-minute Pack

Question 1

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Answer: Antony van Leeuwenhoek

Question 2

Level 1 Identifies one or two simple reasons why technology mattered for medical change, with little or no supporting detail. **1-3**

Level 2 Describes and begins to explain one or more reasons, with some accurate supporting detail. **4-6**

Level 3 Explains several reasons why technological advances were important, supported by accurate and relevant detail that shows links between technology and medical change. **7-9**

Level 4 Provides a well-developed explanation of why technology was important across the period, with precise, well-selected evidence and clear analysis of the connections between technological change and developments in medical knowledge and practice. **10-12**

Indicative content:

- Technology allowed new phenomena to be observed and measured that were previously invisible, for example the microscope made microbes observable and DNA sequencing made genes readable, each creating entirely new areas of medical knowledge.
- Technologies enabled faster and wider dissemination of knowledge, for example the printing press spread Vesaliuss anatomical diagrams, and later journals and digital databases distributed images and sequence data rapidly between practitioners and researchers.
- Technological advances often changed diagnostic and treatment capabilities directly, for example X-rays and MRI scanning improved diagnosis, and DNA sequencing enabled genetic testing and personalised medicine.
- Technology shaped the organisation of medical research and practice, for example laboratories and imaging departments became central institutions, while learned societies and journals created channels for validating and sharing technical advances.
- A strong answer links specific technologies to measurable changes in outcomes or practice, and recognises that technology required other factors, such as training and institutional support, to produce lasting medical change.

Question 3

Level 1 Shows limited relevant knowledge and offers only a simple judgement about the statement, with little or no supporting evidence. **1-4**

Level 2 Uses some relevant knowledge to describe arguments for and against the statement, but the conclusion is limited and not fully supported. **5-8**

Level 3 Explains a range of relevant points for and against the statement, supported by accurate evidence, and reaches a supported judgement on how far communication networks were as important as technologies. **9-12**

Level 4 Gives a balanced, well-developed assessment of the relative importance of communication networks and technologies across the period, using well-selected evidence and clear analysis to reach a sustained judgement. **13-16**

Indicative content:

- For: communication networks multiplied the impact of technologies by spreading discoveries quickly; the printing press turned Vesaliuss single workshop into a pan-European challenge to Galenic anatomy, and journals and societies in the seventeenth century created early peer review and standards.
- For: in the twentieth and twenty first centuries digital networks and shared databases allowed large scale collaborations, for example the Human Genome Project depended on international data sharing as well as on DNA sequencing machines.
- Against: some technologies produced change independently by making new observation or treatment possible, for example the microscope revealed microbes that could not have been deduced from communication alone, and X-rays immediately changed diagnosis once the device existed.
- Balanced: the most powerful medical change often required both a technology and effective communication to spread and validate it, for example a new imaging or sequencing technique needs journals, conferences and training so clinicians can adopt it safely.
- Good answers weigh specific historical examples across centuries and conclude whether communication networks were equally important, more important, or less important than the technologies themselves, supported by analysis of causation and consequence.

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