2.6 The Western Front, 1914-18: Advances in Surgery and Blood Transfusion: 30-minute Pack

EDEXCEL 1HI0 · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Questions 2 and 3 refer to Source A and Source B. Write in full sentences for Questions 2, 3, 4 and 5. You are advised to spend about 30 minutes on this pack.

Source A and Source B: A Stored Blood Transfusion Before Cambrai, 1917

Source A and Source B were written for Revision Library as original, representative teaching material. Source A is an account in the style of a Royal Army Medical Corps surgeon's diary, written to represent the kind of first-hand experience described in verified historical accounts of transfusion practice at a Casualty Clearing Station in 1917; it is not the testimony of a real, named individual, and no genuine wartime document has been reproduced or quoted. Source B is an illustrative timeline table styled on historical research into medical advances during the war; its details are representative for teaching purposes, not an authentic official record.

SOURCE A: from a diary written in the style of a Royal Army Medical Corps surgeon at a Casualty Clearing Station, autumn 1917.

A transfusion before an operation would once have meant finding a donor on the spot, laying him beside the patient and connecting the two directly, which is not always possible when every man on the station is needed elsewhere. Today we drew instead on the stored blood brought up from the new depot, kept from clotting with the citrate solution and carried forward ready for use. It made all the difference with this case, a soldier who had lost a great deal of blood before he even reached us; there was no time to find and match a living donor, and without the stored supply I doubt he would have survived the wait for surgery. The method is new enough that not every station has adopted it yet, but where it has, I have seen it save men who would otherwise have died on the table before we could begin.

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SOURCE B: an illustrative timeline table showing selected medical advances during the First World War relevant to the treatment of wounded soldiers.

Approximate date	Advance	Significance
From 1915	Sodium citrate used as an anticoagulant	allowed donated blood to be stored and transported rather than needing a direct, live donor for every transfusion
From 1915-16	Mobile X-ray units used more widely at Casualty Clearing Stations	let surgeons locate embedded shrapnel, bullets and fractures before operating
1917	A stored blood depot set up ahead of the Battle of Cambrai	allowed transfusions to be carried out using blood collected and stored in advance
From 1917	A specialist facial injury and plastic surgery unit established at Sidcup	brought together surgeons developing new reconstructive techniques for severe facial wounds

Note: the dates and details above are illustrative estimates for teaching purposes, summarising the broad pattern of advances described in historical research, not an exact official record.

1 Name two individuals associated with advances in the surgical or medical treatment of wounded soldiers on the Western Front.

(Total for Question 1 is 2 marks)

2 How useful is Source A for an enquiry into advances in blood transfusion during the First World War? Explain your answer, using Source A and your own knowledge of the historical context.

(Total for Question 2 is 8 marks)

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3 How could you use Source A and Source B to find out about medical advances during the First World War? Explain your answer, using Source A, Source B and your own knowledge.

(Total for Question 3 is 8 marks)

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4 Source A suggests one possible line of enquiry into advances in blood transfusion on the Western Front. Complete the table to explain how you could follow this up.

(a) Detail in Source A that I would follow up: **(1)**

(b) Question I would ask: **(1)**

(c) What type of source I could use: **(1)**

(d) How this might help answer my question: **(1)**

(Total for Question 4 is 4 marks)

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5 Explain why advances in surgery and blood transfusion during the First World War were significant for wounded soldiers on the Western Front.

(Total for Question 5 is 8 marks)

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Mark scheme · 2.6 The Western Front, 1914-18: Advances in Surgery and Blood Transfusion: 30-minute Pack

Question 1

any one of: Karl Landsteiner, Oswald Robertson, Harold Gillies, Alexis Carrel or Henry Dakin (accept another correctly linked individual, e.g. Hugh Owen Thomas or Marie Curie)	**B1**
a second, different individual from the same list	**B1**

Answer: Any two of: Karl Landsteiner, Oswald Robertson, Harold Gillies, Alexis Carrel, Henry Dakin (or another correctly linked individual).

Question 2

Level 1 Makes a simple comment on the content of Source A, with little or no reference to its nature, origin or purpose, or to own knowledge.	**1-2**
Level 2 Describes the content of Source A and begins to comment on its value, with limited reference to its nature, origin, purpose or own knowledge.	**3-4**
Level 3 Analyses the content and the nature/origin/purpose of Source A, using own knowledge to support a developing judgement about how useful it is for the given enquiry.	**5-6**
Level 4 Analyses the content and the nature/origin/purpose of Source A in a well-supported and convincing way, using precise own knowledge to reach a sustained judgement about how useful it is for the given enquiry, considering its limitations.	**7-8**

Indicative content:

- Content: Source A shows a surgeon contrasting older direct donor-to-patient transfusion with newer stored blood, drawn from a depot and kept usable with citrate, and shows the newer method saving a casualty who could not wait for a living donor.
- Content: it shows that the stored method was not yet used everywhere, giving a sense of how new and unevenly adopted the advance was in 1917.
- Nature/origin/purpose: as an account written to represent an RAMC surgeon's diary, it reflects the kind of first-hand testimony historians use for medical advances, but because it is written for this pack rather than a genuine wartime diary, it cannot be used as direct primary evidence for a specific date, unit or patient.
- Own knowledge: contextual knowledge of Landsteiner's 1901 discovery of blood groups, the introduction of sodium citrate from around 1915, and the 1917 Cambrai blood depot can be used to assess whether the account is consistent with verified historical accounts of the period.
- A full answer weighs the source's plausible, typical content, consistent with verified historical knowledge of transfusion advances, against its limitations as illustrative rather than archival material, before reaching a judgement on its usefulness for the stated enquiry.

Question 3

Level 1 Makes a simple comment on the content of one source, with little or no reference to using the sources together or to own knowledge.	**1-2**
Level 2 Describes the content of both sources and suggests, in general terms, what each could be used to find out.	**3-4**
Level 3 Explains what Source A and Source B could each be used to find out, and begins to explain how they could be used together, supported by own knowledge.	**5-6**
Level 4 Explains clearly and convincingly what Source A and Source B could be used to find out both separately and together, supported throughout by precise own knowledge of the historical context.	**7-8**

Indicative content:

- Source A shows in detail how one surgeon used the stored blood advance in practice, and the difference it made to a single casualty, which could be used to investigate what stored transfusion meant for treatment on the ground.
- Source B shows the wider pattern of several medical advances across the war, with approximate dates, which could be used to investigate how and when different advances developed relative to each other.
- Used together, Source A's individual case and Source B's timeline could be used to investigate how far the surgeon's account of a 1917 transfusion fitted the wider, dated pattern of advances shown in Source B, including the Cambrai depot.
- Own knowledge could be used to check both sources against what is known about Landsteiner's discovery of blood groups, the introduction of sodium citrate, and the wider adoption of X-rays and Gillies' plastic surgery unit.
- A full answer explains what each source could be used to investigate, and how using them together allows a more complete enquiry than either source alone, while noting that both are illustrative rather than genuine archival material.

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Question 4

(a) a relevant detail identified, e.g. the surgeon states that the stored blood method was new enough that not every Casualty Clearing Station had adopted it yet by autumn 1917 **B1**

(a) Answer: The stored blood method was still new enough in autumn 1917 that not every Casualty Clearing Station had adopted it.

(b) a follow-up question that clearly relates to the chosen detail, e.g. how quickly and how widely did stored blood transfusion spread to Casualty Clearing Stations across the Western Front after 1917 **B1**

(b) Answer: How quickly and how widely did stored blood transfusion spread to Casualty Clearing Stations across the Western Front after 1917?

(c) an appropriate type of source named, e.g. RAMC medical reports or supply records showing which Casualty Clearing Stations received stored blood equipment and when **B1**

(c) Answer: RAMC medical reports or supply records showing which Casualty Clearing Stations received stored blood equipment and when.

(d) a clear explanation linking the source type to the question, e.g. supply records would show which stations had received citrate and storage equipment by a given date, letting me measure how widely and how quickly the method actually spread **B1**

(d) Answer: Supply records would show which stations had received citrate and storage equipment by a given date, letting me measure how widely and quickly the method actually spread.

Question 5

Level 1 Identifies one or two general reasons why these advances mattered, with little or no supporting detail or explanation. **1-2**

Level 2 Identifies and begins to explain one reason, supported by accurate detail. **3-4**

Level 3 Explains two reasons why these advances were significant, each supported by accurate and relevant detail. **5-6**

Level 4 Explains two or more reasons in a well-developed, logically structured way, supported throughout by precise and accurate detail, showing how the reasons connect. **7-8**

Indicative content:

- Stored blood transfusion, made possible by sodium citrate and later by depots such as the one set up before Cambrai in 1917, meant surgeons no longer had to find a living, matched donor at the exact moment a casualty needed a transfusion, saving crucial time before surgery.
- This was especially important for casualties who had already lost a great deal of blood, as shown in Source A, since waiting for a donor could mean the patient died before an operation could even begin.
- Mobile X-ray units let surgeons see exactly where shrapnel, bullets or fractures were before operating, making surgery faster and more accurate, and reducing the risk of unnecessary additional damage from searching for fragments during the operation itself.
- Harold Gillies' work on facial reconstruction from 1917 addressed a category of severe injury that existing surgical techniques could not properly treat, giving badly disfigured soldiers a realistic chance of returning to a more normal appearance and life.
- Overall, these advances worked together to improve survival and long-term outcomes: better diagnosis through X-rays, more available blood for transfusion, and new reconstructive techniques all reduced deaths and long-term suffering compared with earlier in the war.

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