

Paper 1

Historic Environment:

The British Sector of the Western Front, 1914-18:

Injuries, Treatments and the Trenches



Name

British Sector of the Western Front – Revision Checklist

<i>How well do I know each topic?</i>				
				
2	<i>The exam</i>			
3	Context: Medicine in the early 20 th century			
4	Context: British sector of the Western Front			
6	<i>Recap of context</i>			
7	Medical conditions on the Western Front			
8	The work of RAMC and FANY			
10	Experiments in surgery and medicine			
13	<i>Sources</i>			

The Exam

Q1: (4 marks)

Describe the features of... _____.

Describe **two** features of Casualty Clearing Stations.

Q2 (a): (8 marks)

How useful are Sources A and B for an enquiry into... _____ ?

How useful are Sources A and B for an enquiry into the treatments available for wounded soldiers on the Western Front?

Q2 (b): (4 marks)

Study Source _____.

How could you follow up Source _____ **to find out more about...** _____ ?

Study Source A. How could you follow up Source A to find out more about the treatments that were available for wounded soldiers on the Western Front?

This section of the exam will have 3 questions:

Q1, Q2(a) and Q2(b).

You should spend around 20-25 minutes on this part of the exam, leaving around 50 minutes for the *Medicine Through Time* section.

Medicine in the Early 20th Century

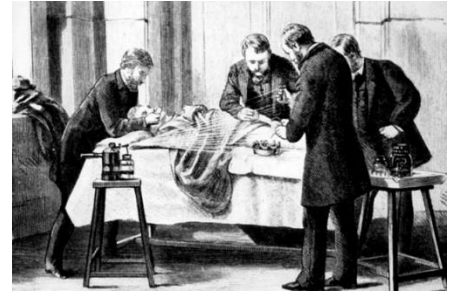
There had been several medical breakthroughs in the years before WW1:

- Aseptic surgery

Joseph Lister had used the first antiseptic in 1865, and this led to the development of **aseptic surgery** – removing all germs from the operating area *before* surgery.

Because of Lister's work, by the late 1800s most operations used aseptic methods:

- Surgeons washed their hands, face and arms
- Rubber gloves and gowns were worn
- Surgical instruments were steam sterilised
- The air was sterilised by being pumped through the heating system



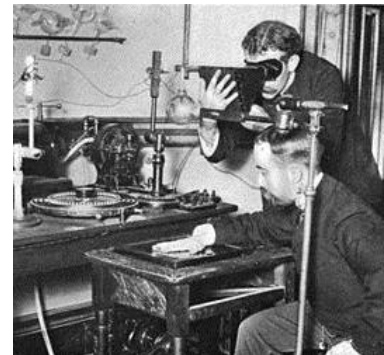
- X-rays

X-rays were discovered accidentally by German physicist **Wilhelm Roentgen** in **1895**.

Radiology departments opened in some British hospitals as early as 1896. This meant that doctors were now able to look inside the body without having to cut the patient open.

However, there were some problems with early x-rays:

- People didn't fully understand the risks of **radiation**. Patients could suffer burns or hair loss because of the high levels of radiation.
- Roentgen developed a table-top machine, but the glass tube used was fragile and easily broken.
- An x-ray of a hand on the table-top machine took about 90 minutes!
- Larger x-ray machines were difficult to move around.



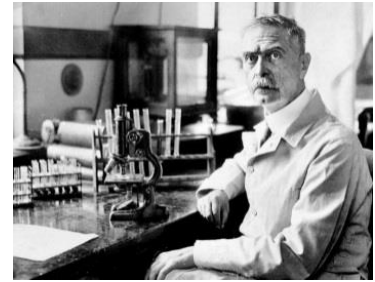
- Blood transfusions and blood banks

Blood loss was still a major problem during surgery in the late 1800s. Now that doctors had anaesthetics and antiseptics, they often attempted more complex operations.

James Blundell had carried out the first human blood transfusion in 1818. Because blood could not be stored for later use, early transfusions involved the **donor** being directly connected to the **recipient** by a tube. Blundell performed 10 transfusions in total – 5 were successful.

Scientists knew that certain chemicals could stop blood clotting when it leaves the body, but these could also have side effects like convulsions.

Karl Landsteiner discovered the first 3 **blood groups** (A, B and O) in 1901. This made blood transfusions more successful because it stopped the donor's blood being rejected by the recipient's body.



The British Sector of the Western Front

World War One began in August 1914 and ended in November 1918.

How did the trenches develop?

- Britain declared war on Germany on August 4th 1914.
- The **British Expeditionary Force (BEF)** was sent to France to stop the Germans advancing through Belgium.
- Soldiers began to dig small trenches to shield themselves from machine gun fire.
- **Stalemate** developed - neither side could advance, so both dug in to hold their ground. Eventually a line of trenches stretched from the English Channel in the north to Switzerland in the south.
- A more complex trench system developed from 1915:
 - There was a **frontline trench**, where attacks were made from.
 - Behind this was the **support trench**.
 - Behind the support trench was the **reserve trench**.
 - These trenches were connected by a **communication trench**.
 - Trenches were dug in a zigzag pattern.

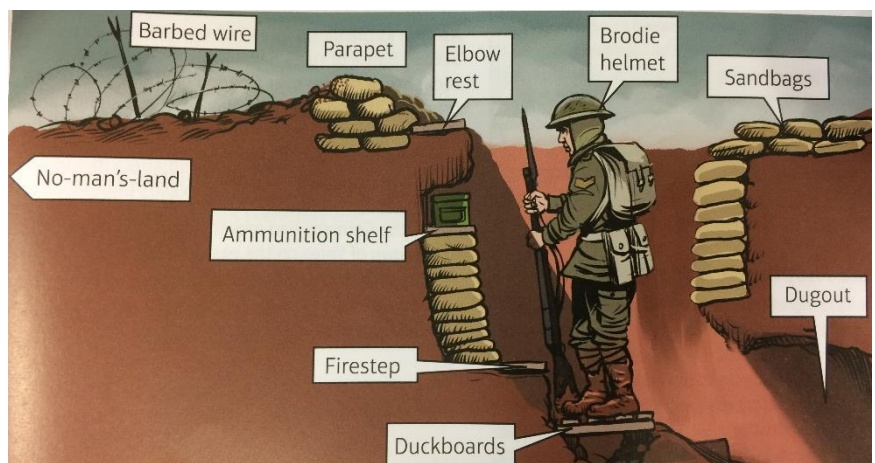
BEF

British Expeditionary Force. The British Army sent to the Western Front.

The space in between the two lines of trenches was called **no-man's-land**. Barbed wire was placed in no-man's-land to slow down enemy attacks.

Holes called **dugouts** were dug into the sides of the trenches, where men could take cover.

Trenches were generally about 2.5m deep.



Key Battles

- [The First Battle of Ypres \(1914\)](#)

The Germans attacked British positions in the Belgian town of Ypres in October 1914. The British lost over **50,000** troops but managed to keep control of the important **English Channel ports**.



- [Hill 60 \(1915\)](#)

Hill 60 was a man-made hill near Ypres that was captured by the Germans in December 1914. Its height gave them a strategic advantage. In **April 1915**, the British tunnelled under the hill, placed five **mines** under it, then blew the top off to recapture it.

- [The Second Battle of Ypres \(1915\)](#)

April and May 1915. It was the first time the Germans used **chlorine gas**.

- [The Battle of the Somme \(1916\)](#)

Around **20,000** British soldiers died on the first day alone. The British tried out two new tactics, which both increased casualties:

- The **creeping barrage**: This was where artillery was launched from the trenches just ahead of the British infantry as it advanced forwards.
- **Tanks**: These were unsuccessful because of their low speed and unreliability.

In total, the Somme cost the British about **400,000** lives.

- [The Battle of Arras \(1917\)](#)

In 1916, the British linked the existing chalky tunnels, caves and quarries at Arras to create a safe underground network, dug by tunnelling companies from Britain and New Zealand.

In **April 1917**, 24,000 men who had been hiding in the tunnels attacked. The British advanced about 8 miles. However, their progress slowed and by the end there were nearly **160,000** British and Canadian casualties.

- [The Third Battle of Ypres \(1917\)](#)

The aim of this battle was for the British to break out of the **Ypres Salient**. A **salient** is an area of a battlefield that is **surrounded by the enemy on three sides**, so is very vulnerable.

The weather turned to rain, and the ground became so **waterlogged** that men would **drown** in the mud. By the end the British had regained about 7 miles, but with about **245,000** casualties.

- [The Battle of Cambrai \(1917\)](#)

Cambrai saw the first large-scale use of **tanks** – nearly 500 were used. They could move easily over the **barbed wire** and their **machine guns** were effective.

Recap: Early 20th Century Medicine & Context of the Western Front

- 1. Whose work led to aseptic surgery being developed in the late 19th century?**
- 2. Name 2 methods used to prevent infection during surgery.**
- 3. Name 2 medical discoveries/inventions made in the 20 years before the war.**
- 4. What was one problem with early x-rays?**
- 5. Why did the war develop into trench warfare?**
- 6. Name 2 features of the trench system.**
- 7. Which major battle cost an estimated 400,000 British lives?**
- 8. At which battle was gas used for the first time?**
- 9. What happened at Hill 60?**
- 10. What was the BEF?**



Trench fever

Caused by: Body lice

Symptoms: Flu-like (high temperature, headache, aching muscles)

Solutions: Delousing stations were set up



Trench foot

Caused by: Standing in cold water or mud

Symptoms: Painful swelling of the feet, eventually leading to gangrene (decomposition)

Solutions: Rubbing whale oil on the feet; keeping dry and changing socks regularly; amputation (worst case)



Gas gangrene

Caused by: Open wounds infected by bacteria from soil

Symptoms: Dead tissue. The bacteria caused gas to build up in the wound

Solutions: Amputation of infected areas

Shellshock

Caused by: Psychological damage

Symptoms: Tiredness, nightmares, headaches, loss of speech, shaking, mental breakdown

Solutions: In some cases, treatment back in Britain. Generally, shellshock was misunderstood and sufferers were often accused of cowardice



Shrapnel injuries

Caused by: Being hit by bullets or shrapnel from rifles/explosions

Symptoms: Pieces of metal would penetrate the body, taking with it parts of uniform, soil and dirt

Solutions: Steel Brodie helmets were worn to protect the head



Gas attacks

Caused by: Chlorine, phosgene and mustard gas

Symptoms: Burning skin, internal and external blisters, death by suffocation. Massive psychological impact – fear and panic

Solutions: Gas masks were developed in 1915



An account of a British woman's experiences as a Red Cross nurse during the war.

As the reader perhaps knows, treating wounds in a home-hospital under surgically clean conditions is a very different thing from dealing with mangled and shattered flesh where the wounds are filled with mud, torn clothing and shrapnel. Often these men had received no first-aid treatment, and their wounds had remained uncovered for as long as two or three days. With few exceptions all these cases were septic.

What do we learn from this source about the problems facing medical treatment on the Western Front?

The Work of RAMC and FANY

Chain of evacuation

There was a **chain of evacuation** to get the wounded from the frontline to a safe treatment area. The main stages were not always followed in the same order for every casualty.



Regimental Aid Posts (RAP)

- Gave **immediate first aid**
- Aimed to get as many men as possible back to the fighting
- Could not deal with serious injuries – these patients were moved onto the next stage
- Usually located near to the frontline, in communication trenches or abandoned buildings



Dressing Stations (ADS and MDS)

- Dealt with **more serious injuries**
- Located in abandoned buildings, bunkers or tents
- In theory, there should have been an **Advanced Dressing Station** with a **Main Dressing Station** half a mile behind it, but often this wasn't the case
- Staff at the Dressing Stations belonged to a unit of the RAMC called the **Field Ambulance**



Casualty Clearing Stations (CCS)

- Often dealt with **critical injuries**
- Set up in buildings such as factories and schools, often near a railway line
- **Triage** system – men were divided into 3 groups:
 - **The walking wounded** could be patched up and sent back to the fighting.
 - Those **needing hospital treatment** were transferred to a Base Hospital.
 - Those who had **no chance of survival** were made comfortable, but medical resources were not spent on them.



Base Hospitals

- Located **near the coast** so wounded men could be shipped back to Britain
- As the war went on, CCSs did more of the jobs originally intended for Base Hospitals
- Divided patients up into **different wards** according to their wounds. This allowed doctors to experiment and specialise in particular injuries
- In 1918, the Germans launched a last-ditch offensive which threatened the CCSs, so much of the surgery was once again carried out in the Base Hospitals.

RAMC

Royal Army Medical Corps. The branch of the army responsible for medical care, founded in 1898.

FANY

First Aid Nursing Yeomanry. Founded in 1907. A women's organisation which sent volunteers to the Western Front. It supported medical services on the frontline, e.g. by **driving ambulances** and **giving emergency first aid**.

The role of FANY

The first 6 FANYs arrived in France in **October 1914**, but they initially helped the French and Belgian troops because the British wouldn't make use of them.

In 1916 the British army allowed FANYs to drive ambulances, replacing Red Cross male ambulance drivers. FANYs opened the way for more women (such as those in the Voluntary Aid Detachments [VAD]) to join in on the frontline.



Note down two pieces of contextual knowledge that are relevant to this source.

From a post-war account by Beryl Hutchinson, describing her first experience of gas in 1915. Beryl was a FANY in Belgium.

At dawn I woke to a very queer noise and an even queerer smell. The Belgian Quarter-Master came round with gas masks. All our men had had gas masks already issued and were firing for all they were worth. Out of the mist came a procession of British, staggering up the lane or just lying in a groaning, gasping heap. They had the silliest bits of chewed cotton wool fastened to their faces. We had the idea that hot black coffee, being so very good for asthma attacks, might help...

The underground hospital at Arras ("Thompson's Cave")

Beginning in November 1916, a fully working hospital was created in the tunnels under Arras. (It was essentially a Dressing Station because it was so close to the frontline.) It had:

- Waiting rooms for the wounded
- 700 spaces where stretchers could be placed as beds
- An operating theatre
- Rest stations for stretcher bearers
- A mortuary
- Electricity and piped water

It was abandoned during the Battle of Arras in 1917.

Ambulance wagons

At first **horse-drawn ambulance wagons** were used to carry the sick and wounded, but these were so shaky that they **often made injuries worse**.

Motorised ambulances were introduced with help from public donations. However, horse-drawn wagons were still used where the ground was too muddy for motor vehicles.



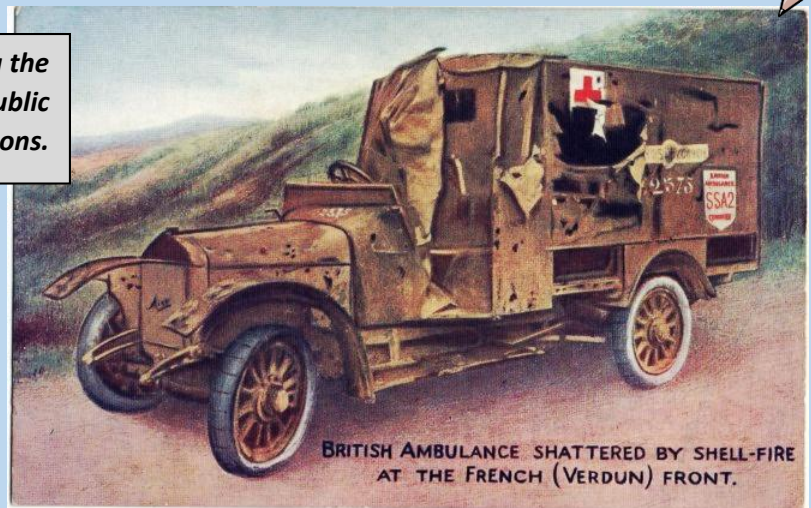
Wounded men were also taken by **train** or **canal** to **Base Hospitals** on the coast - some trains even had operating theatres.

Some of the wounded were transferred directly onto ships to be taken back to Britain.

A postcard published in Britain during the war. Its aim was to encourage public donations for more ambulance wagons.

How is this source useful to a historian studying the conditions faced by ambulance drivers on the Western Front?

Are there any limitations to its usefulness?



Experiments in Surgery and Medicine

What problems faced treatment?

- The **contaminated conditions** made aseptic surgery impossible. Shrapnel, dirt and bits of uniform in wounds caused infection.
- The **sheer number** of casualties meant the system often struggled to cope.

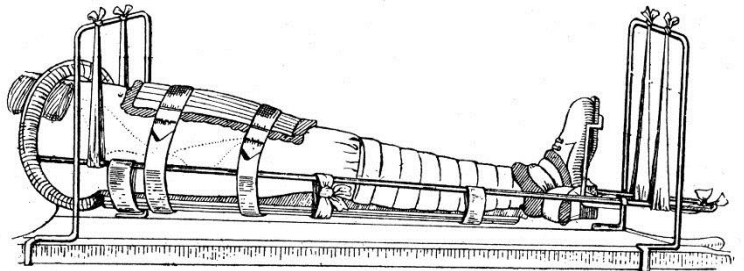
What were the methods of dealing with infection?

- **Debridement** – the removal of dead or infected tissue.
- The **Carrel-Dakin method** – using a sterilised salt solution in the wound through a tube (antiseptics like carbolic acid didn't work on gas gangrene).
- **Amputation** – removing infected limbs. 240,000 men had lost limbs by 1918.

The Thomas splint

This was a large splint designed to **keep limbs and joints still** during surgery.

Many men died from shrapnel wounds to the leg because the leg was not kept rigid during transfer from the frontline to a CCS, leading to blood loss and infection.



Robert Jones came forward with a splint that his uncle, **Hugh Thomas**, had developed in the late 1800s. In December 1915 he was sent to Boulogne to instruct medics how to use it.

The **Thomas splint** improved the survival rate for these leg injuries from 20% to 82%.

Mobile x-ray units

X-rays were used from the start of the war to locate bullets and shrapnel in wounds.

Problems:

- X-rays **couldn't identify all objects** in the body – e.g. fragments of clothing
- An x-ray took **several minutes**, a long time for a wounded man to keep still
- The x-ray machines could only be used for an hour before they **overheated**. 3 machines would be used in rotation, so that one worked while the others cooled down.

The Base Hospitals had static (non-moving) x-ray machines. The British also had 6 mobile x-ray units, which were vans loaded with x-ray equipment. The equipment was laid out in a tent at the back of the van.



Blood transfusions

Lawrence Bruce Robertson, a Canadian doctor, developed blood transfusions on the Western Front. He used a syringe and tube to transfer blood from the donor to the patient.

Blood transfusions were carried out in Base Hospitals, and by 1917 in Casualty Clearing Stations too. Geoffrey Keynes, a British doctor in the RAMC, designed a portable blood transfusion kit so that transfusions could be carried out near the frontline.

Blood banks

- In 1915, Richard Lewisohn found that adding sodium nitrate to blood stopped it clotting.
- Also in 1915, Richard Weil discovered that blood with sodium nitrate could be stored for up to 2 days if refrigerated.
- In 1916, Francis Rous and James Turner found that adding a citrate glucose solution allowed blood to be stored for up to 4 weeks.



At the **Battle of Cambrai** in 1917, an American doctor built a carrying case for bottles of donated blood. He treated 20 severely wounded soldiers during the battle, of which 11 survived.

These blood banks were important because they made blood more easily available on the frontline, meaning badly injured soldiers were **more likely to survive**.

Head injuries and brain surgery

About **20%** of British wounds were to the head, face and neck. At the start of the war, brain injuries were usually fatal because unconscious/confused patients were **difficult to move through the chain of evacuation**, and very few doctors had experience of **neurosurgery**.

An American surgeon called **Harvey Cushing** developed new brain surgery techniques by observing and experimenting.

He used a magnet to remove metal fragments from the brain, and used **local anaesthetic** (numbing the area being operated on) rather than general anaesthetic (putting the patient to sleep), because general anaesthetic swelled the brain.

Plastic surgery

A New Zealand doctor called **Harold Gillies** developed methods of restoring and rebuilding destroyed facial features.



The intricate operations and recovery needed for plastic surgery had to be carried out back in Britain. The key hospital for plastic surgery was the Queen's Hospital in Kent, which Gillies helped design in 1917. By the end of 1917, the hospital had carried out nearly **12,000** operations.



A postcard showing one of the wards of the Queen's Hospital, Kent, produced by the hospital in around 1917. The Queen's Hospital specialised in plastic surgery procedures.



Look at the injuries in this picture.

What other sources might a historian use to investigate injuries on the Western Front?

Sources

NATURE: What is the source? *Photo?*
Diary? Sketch? etc.

AUTHOR: Who produced the
source? When did they produce it?

CONTENT: What does the source
show? What can we infer from the
source?

HAPPENING: What relevant
knowledge do you have? What was
going on at the time?

OMITTED: Is there anything the
source doesn't show us? Has the
author left anything out?

SPECIAL REASON: Why was the
source produced? What is its
purpose?

- **Soldier's diary**
- **Doctor/medic's diary**
- **Newspapers/magazines from the time**
- **Government records (e.g. weapons output)**
- **Army medical records**
- **Military records (e.g. service records)**
- **Military instruction manuals**
- **Diagrams/maps/sketches**
- **Propaganda posters**
- **Photographs (official/unofficial)**
- **Poems/songs from the time**
- **Soldier's letters/postcards**
- **Paintings from the time**
- **Speeches in Parliament**