



SURGERY

18TH & 19TH CENTURY

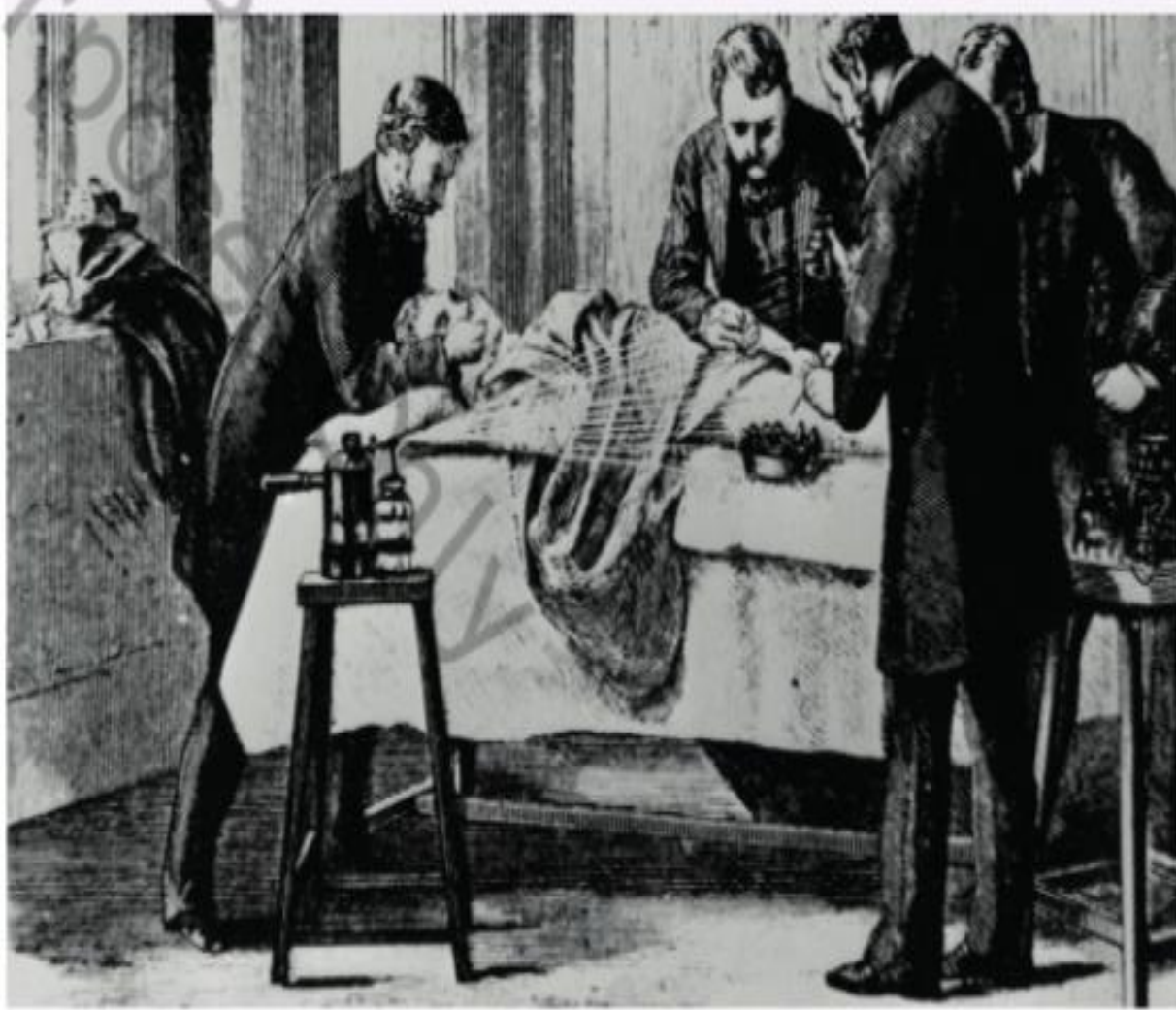
SURGERY IN 1800:



What can you infer from this source about surgery in 1800?

SURGERY IN 1900:

Amputation Clip



What can you infer from this source about surgery in 1900?

CONTEXT: SURGERY IN 1800

- Surgery was VERY dangerous in the early 19th Century and usually fatal.
- There were 3 significant risks...

- **PAIN**

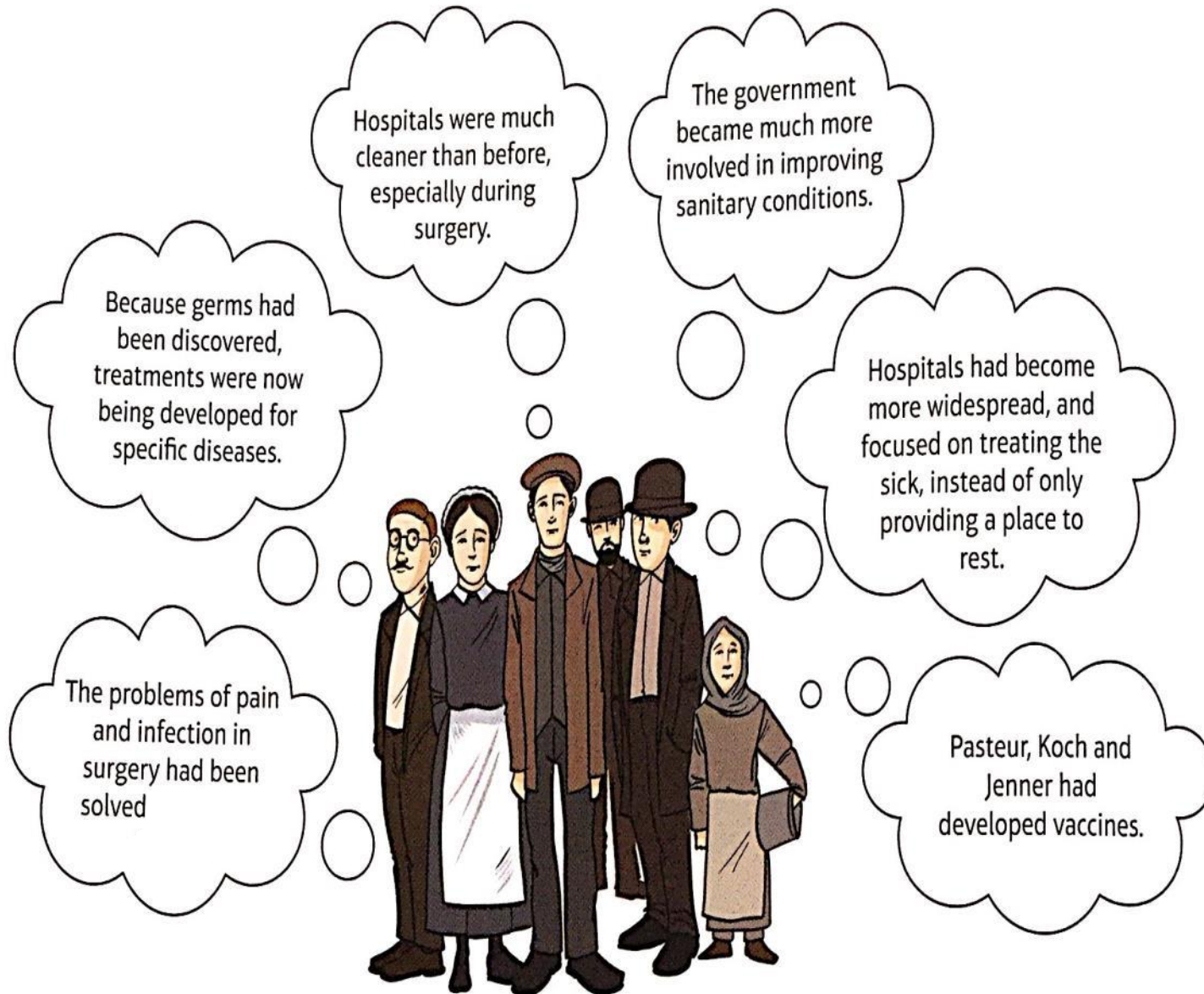
Most common surgical treatments:

- Amputations – due to accidents or complications relating to TB

- **BLOOD LOSS**

- **INFECTION**

SO, HOW FAR HAS SURGERY COME BY 1900?



CHANGE

SO, HOW FAR HAS SURGERY COME BY 1900?

Let's find out how we got to this stage... <https://www.youtube.com/watch?v=C8WbrS0O5FE>



CONTINUITY

PAIN

How have they dealt with pain so far in our journey through time?

In your experience, at a dentist or hospital or wherever, what pain relief have you had for an operation or tooth removed?





KEY EXAM
SKILL:
CONCISE

**Summarise this
information into
approx. 40-50
words**

Although substances like opium had been used for some time to calm patients with severe injuries, without **anaesthetic** there was no way of preventing the excruciating pain that they went through – which sometimes sent them into shock. Surgeries had to be performed quickly, before the patient bled to death on the operating table, as blood transfusions had not yet been developed. **Bleeding** continued to be a problem during surgery throughout the 18th and 19th centuries.

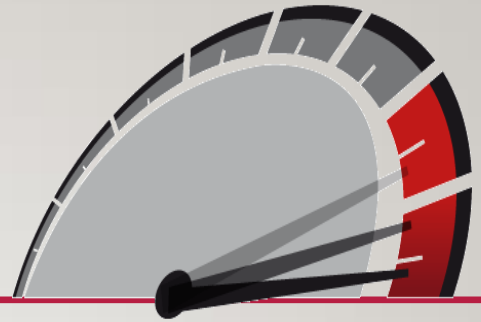
HANNAH DYSON

Watch this clip, answer the following questions:

- **What are the conditions like in the room? (Clean? Clothes?)**
- **What equipment are they using?**
- **What is a ligature?**
- **What is the atmosphere like? (Calm? Chaotic?)**

- **Anything else you want to note or ask...**

SPEED:



Fast

- Suggest a reason to recommend **faster** surgery in this period
- Suggest a reason NOT to recommend **faster** surgery

Slow

- Suggest a reason to recommend **slower** surgery in this period
- Suggest a reason NOT to recommend **slower** surgery

The odds of survival...

The most talented surgeons were able to operate extremely quickly (Robert Liston), this did improve the patients chance of survival. However, with speed came accidents.

Even if the patient survived with a quick operation, they would almost certainly get an infection and die anyway! This was due to the lack of sanitation and germ-free environments, especially as surgery was often performed in the patient's home with the surgeon wearing the same clothes he arrived in!

PROBLEM 1: **PAIN**

- Humphrey Davy experimented with Laughing gas as a painkiller.
- Ether was successfully used by Robert Liston in 1846.
- James Simpson then used Chloroform, most famously on Queen Victoria.

ISSUES THEY FACED DEALING WITH PAIN:



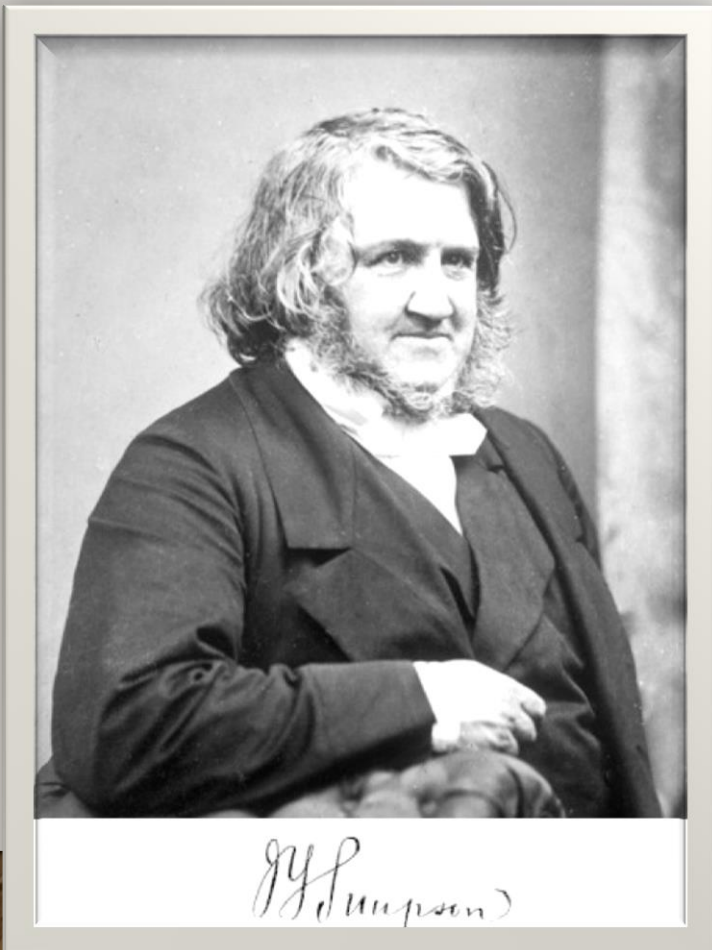
- **Nitrous Oxide (Laughing Gas) –**
Some successes, smaller operations like pulling teeth. Made the patients wriggle and move
- **Ether –**
Was incredibly flammable, especially when you consider the lighting was candle and bare flamed gas lamps. It also killed many patients as a side effect. It irritated the throat and made patients thrash about coughing, even when unconscious
- **Chloroform –**
The dosage often caused death by being given too much, or not being given enough and waking up during surgery

Simpson Video Watch this clip and make notes on any way PAIN is being dealt with

JAMES SIMPSON: CHLOROFORM

Simpson discovered Chloroform as he was convinced there was a better alternative to Ether and Laughing Gas.

He got his friends around and inhaled various chemicals to see what happened. After sniffing Chloroform, everyone passed out.



An artist's impression of the night when James Simpson and his friends discovered the power of chloroform.



Create a timeline of the development of ANAESTHETIC

Timeline

The development of the anaesthetic

1795 Humphry Davy, a dentist's assistant, tried inhaling nitrous oxide, or 'laughing gas'. He discovered that it numbed pain.

1846 Robert Liston, a famous London surgeon, successfully anaesthetised a patient with ether and then amputated his leg.

1853 Queen Victoria used chloroform during the birth of Prince Leopold and spoke favourably of it.

1842 William E. Clarke, an American chemist and doctor, successfully used ether to anaesthetise a patient for a tooth extraction.

1847 James Simpson, a surgical professor in Edinburgh, discovered chloroform.

Successes of Chloroform

- It knocked patients out allowing for slow and pain free surgery
- People were very confident that surgery would be painless
- Queen Victoria used it in 1853 for child birth which helped promote it
- Patients would be still
- **Deeper, longer and more complex surgeries could now take place**

This however meant infection and bleeding became bigger problems - WHY?

Negatives of Chloroform

- The dosage – too much would kill you and too little wouldn't last long enough for the surgery
- The chemical affected the heart which caused some young healthy people to die
- People opposed it on religious grounds eg Child birth
- People didn't trust surgeons
- Men relying on anaesthetics were soft
- Hannah Greener, a 14 year old was one of the first to die from an overdose.

PROBLEM 1: PAIN - PAGE 135-6 (WHITE BOOK)

- 1) What improvements in surgery were made between ancient times and the 19th century?
- 2) What were the only three operations that could be successfully performed by the 1880s?
- 3) What was anaesthetic?
- 4) What were two early forms of anaesthetic?
- 5) What anaesthetic did James Simpson introduce?
- 6) What two problems were there with anaesthetics?
- 7) Why was there opposition to their use?
- 8) Why was anaesthetic finally accepted?

Try to answer them before accessing the text book...

Check point:
What do you now know?

HOMEWORK:

Write a speech or poster encouraging the use of Chloroform

+

Write a counter speech / poster opposing it.

PROBLEM 2: **INFECTION**



ANAESTHETIC ✓

ANTISEPTIC



Joseph Lister

Tackling infection: the development of antiseptic surgery

Anaesthetics had solved the problem of pain. Now, infection had to be tackled.

Historically, due to a lack of understanding about germs, surgeons did not make an effort to keep their surroundings, or even themselves, clean when they operated on patients. In fact, many would wear their most stained doctor's coat to show how much experience they had. Instruments were not washed, and a large number of people would be present during operations – including medical students and 'dressers,' whose job it was to hold the patient still during the

Identify at least 2 issues here that would link to infection..

Video: Lister 5.08 - 7.10

LISTER VIDEO

<https://www.youtube.com/watch?v=eKaaSxENXYM>

What can you learn about Lister and his ideas?

- **Joseph Lister (1827 - 1912)**

- Realised that deaths from operations mostly occurred from infection contracted during the operation as a result of unclean practices.
- He started using Carbolic acid (phenol) during operations to maintain antiseptic conditions with significant improvements
- Like Semmelweiss he initially encountered opposition, but use of his methods by the Germans during the Franco-Prussian war in 1870 provided his major breakthrough and over the next 10 years, the practise of antiseptic surgery became accepted.

What is the connection to Pasteur's Germ Theory?



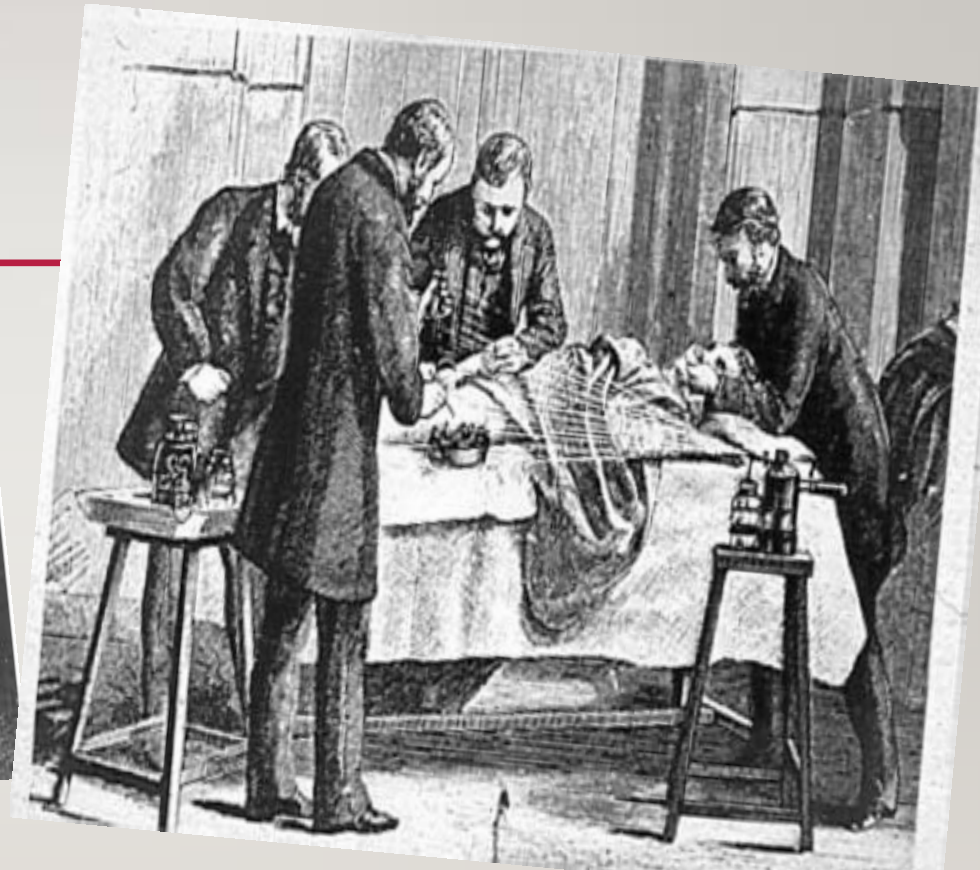


It was first used to sterilise surgical instruments and clean wounds.



Lister discovers that Carbolic Acid is an antiseptic in 1867, by soaking a dressing in it and applying it to a compound fracture of a 14 year old boy.

Lister performing surgery



- **Joseph Lister realised that germs in the theatre had to be destroyed.**
- **He used carbolic acid to kill germs, having seen it used in sewers.**
 - **Carbolic Acid was the first ANTISEPTIC.**

IMPACT OF ANTISEPTIC SURGERY

**In the short term,
surgery did not
change much
because of initial
resistance from
medical
professionals**

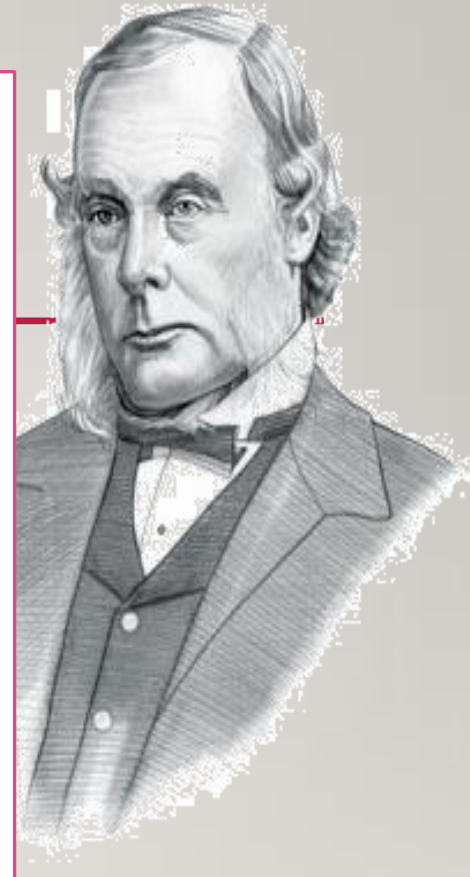
1860s

**In the longer
term, attitudes
changed. New
antiseptic
methods were
developed and
introduced to
improve
surgery**

1890s



IN SUMMARY: **ASEPTIC** SURGERY



- **Joseph Lister was responsible for the big breakthrough in fighting infection. He had studied Pasteur's findings.**
- **He ensured that instruments, the patient, the surgeons hands and even the air were drenched with a carbolic acid spray.**
- **His results were stunning. By 1912 up to 10 times more operations were taking place than 40 years before with less infection.**
- **Steam cleaning was being developed in Germany by Robert Koch and William Halstead of America introduced gloves and masks.**
- **Surgeons now fully understood that safe surgery was possible and it was their duty**
- **It was now safe to be operated on in an ASEPTIC (Germ Free) environment.**

<<< KEY

Key term

Aseptic surgery*

Surgery where microbes are prevented from getting into a wound in the first place, as opposed to being killed off with an antiseptic.

OPPOSITION TO LISTER

The Carbolic Acid got everywhere making it difficult to hold the equipment (knives, scalpels etc)

Many surgeons and doctors still didn't believe or accept the Germ Theory (that the air was full of germs)

The Acid also made it difficult to see what you were doing

It irritated the hands of the surgeons making them crack and become very sore. Surgeons argued that if it did this to hands, it couldn't be good for the patients –

This is how you can remember LISTER – Makes your hands BLISTER



OPPOSITION TO CHANGE:



- Anaesthetics allowed for deeper surgeries to be attempted. Before carbolic spray, bleeding and infection became even bigger problems. The death rate actually increased.
- The Victorians believed pain relief was interfering with God's plan, particularly in child birth, which was meant to be painful!
- It took a long time for doctors to accept that germs caused infection. Surgeons did not want to believe that they might have been responsible for the infections that killed their patients.

Try to answer them before accessing the text book...

PROBLEM 2: INFECTION - PAGE 138-9 (WHITE BOOK)

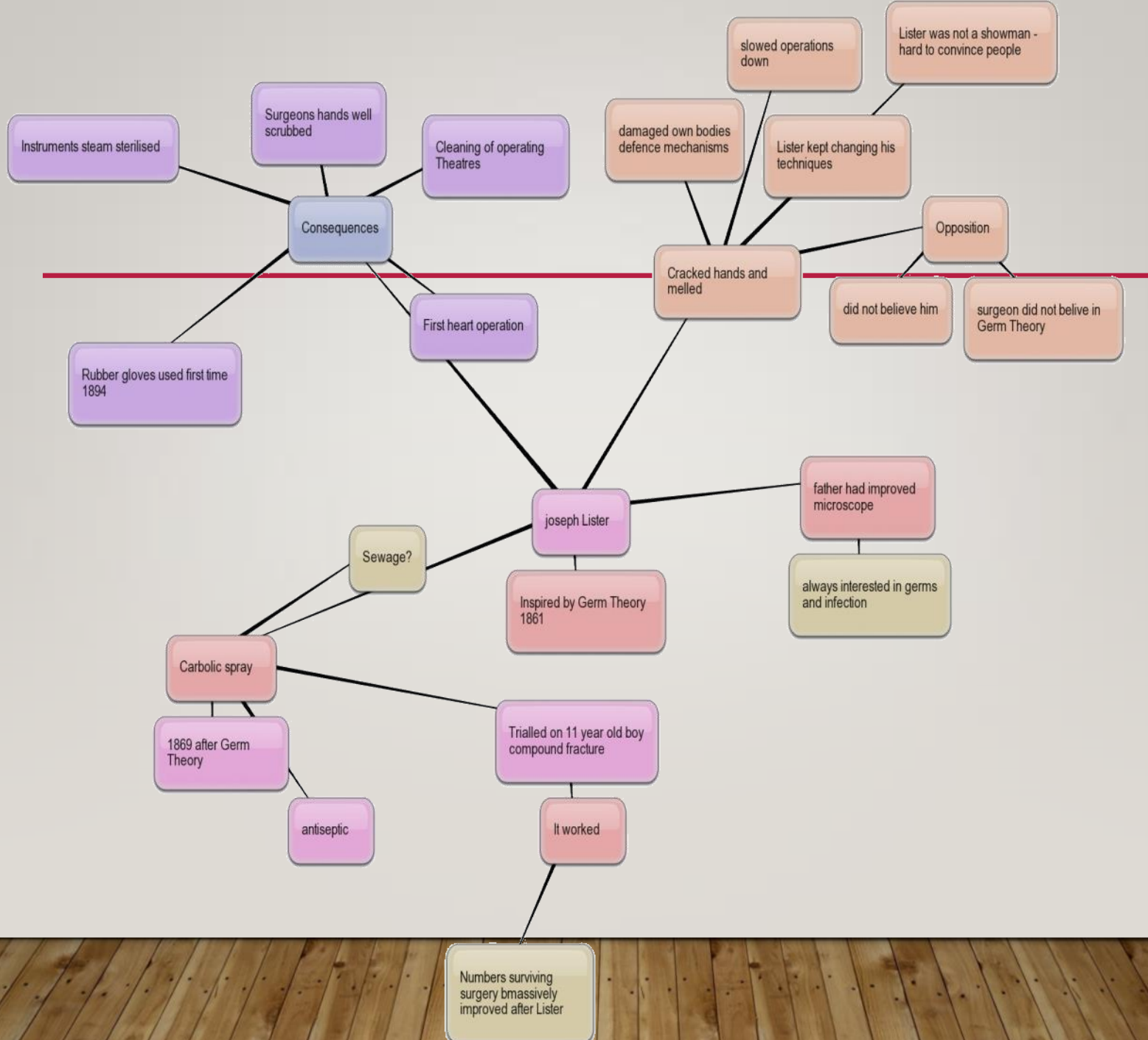
- 1) What improvement did Joseph Lister make to surgery? (p. 138)**
- 2) Where did he get the idea from (p. 138)**
- 3) What changes were made to surgery following Lister's discovery? (p. 139)**



Problems and Opposition

List the most important arguments against from the box on p. 139.

**Check point:
What do you now
know?**



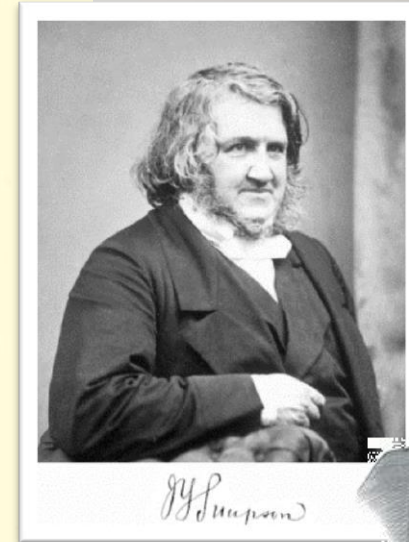
SO... WHO WAS MORE IMPORTANT?

<https://www.youtube.com/watch?v=JhjT0vxivFE>

Activities



- 1 Create an annotated timeline to show the changes that took place in the field of surgery during the 19th century.
- 2 Make flashcards for Simpson and Lister, explaining what they did and what impact this had on surgical techniques.
- 3 Have a debate with a partner about which key individual had the biggest impact. Use the flashcards you made to help you.



Be prepared to share your arguments with the rest of the class

ASSESSMENT:

Exam-style question, Section B

Explain why there was rapid change in surgical treatments in the period c1700–c1900.

You may use the following in your answer:

- chloroform
- Joseph Lister.

You **must** also use information of your own. **12 marks**

Exam tip

Make sure that you focus on the reasons why development of surgical treatment was rapid – avoid simply describing the use of anaesthetics and antiseptics.