

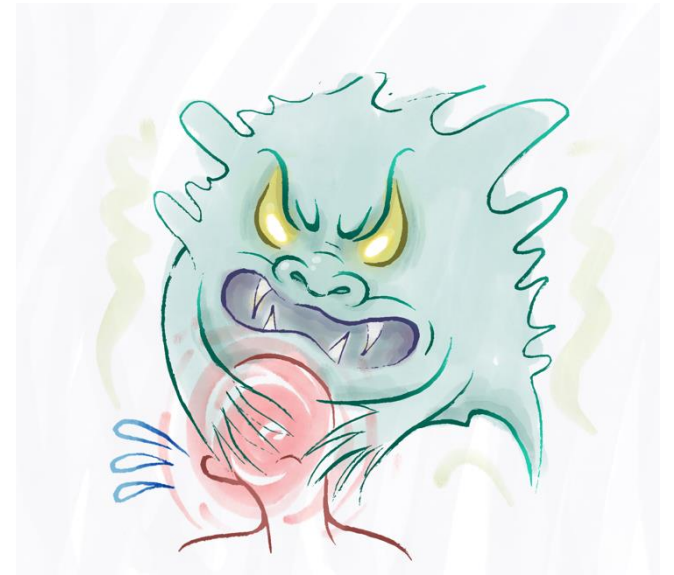
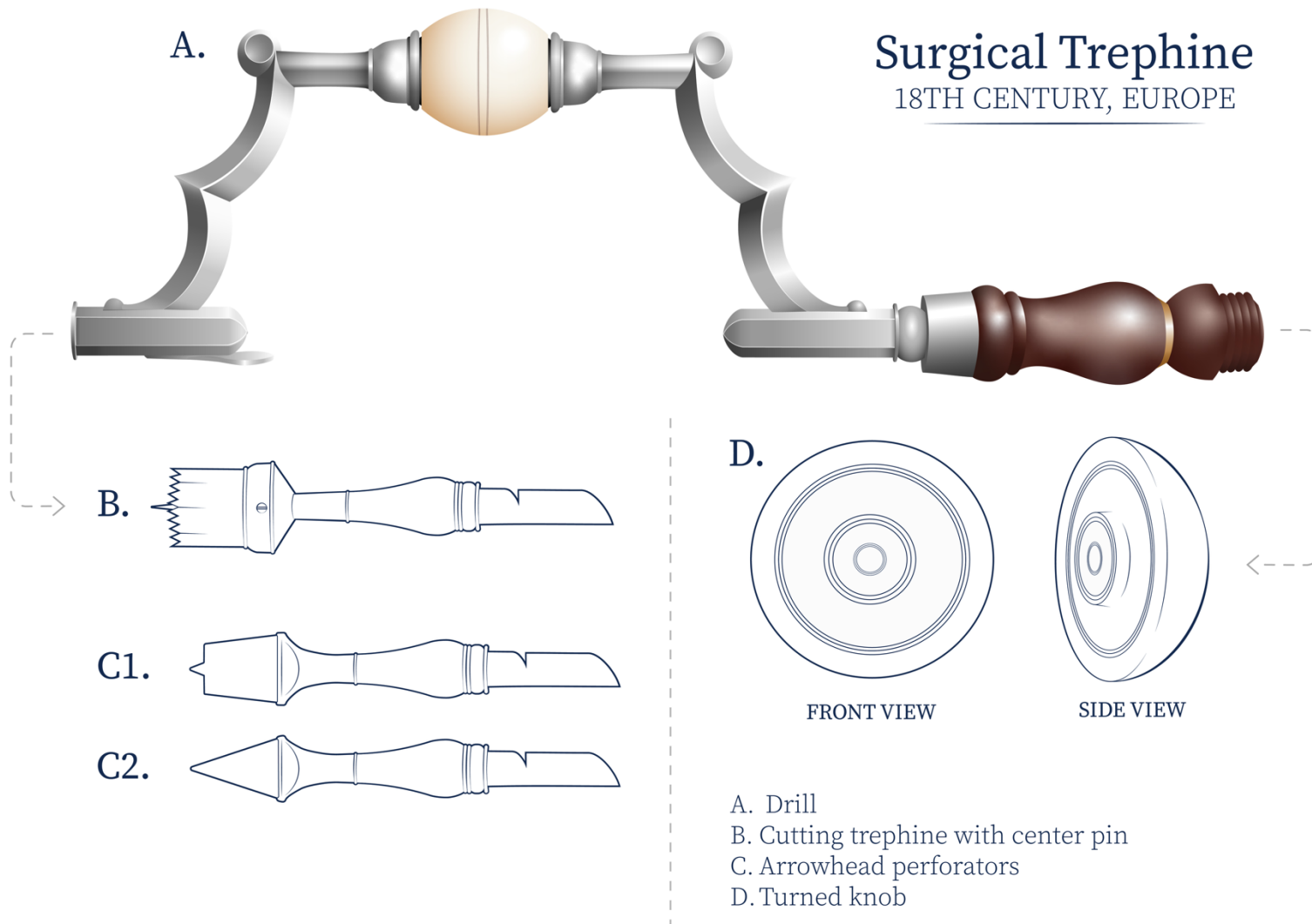


Figure 1. The finalised trephine illustration (left).

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Figure 2. A supplementary drawing of an evil spirit (right).

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5.1 Trepanning

A craniotomy is an operation that involves drilling a hole into the skull and gives access to the brain. This procedure has a significant history, with its ancient version known as [trepanning \(trepanation\)](#).

Objectives

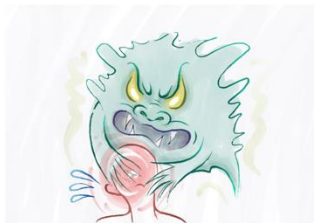
1. To **discuss** why trepanation survival rates were so high in 13th - 16th century Peru.
2. To **explain** why there was a decline in Western trepanning after 1500AD.
3. To **list** the key tools healers used for trepanning.

Archaeologists have found evidence of trepanning from Mesolithic (15000 – 2500BC) and Neolithic (4300 – 2000BC) times, making it one of the oldest surgical procedures. Trepanning continued into the Middle Ages (500 – 1500 AD) and Renaissance period (1400 – 1600 AD) but eventually lost popularity in Europe due the high rates of infection.

There were several reasons why some would undergo trepanation, including epilepsy, a raised pressure in the skull (intercranial pressure) and following a severe injury (trauma) to the head. Trepanning also had spiritual importance and, particularly in earlier periods, healers would use the procedure to release individuals from evil spirits. People thought these spirits caused conditions like mental illness or migraines. Additionally, trepanation was also done after death (post-mortem) for spiritual or ritualistic reasons.



The skull of an adult male found in Peru who underwent trepanning (1000 – 1400AD). The appearance of the hole suggests that the skull was gradually scrapped away.

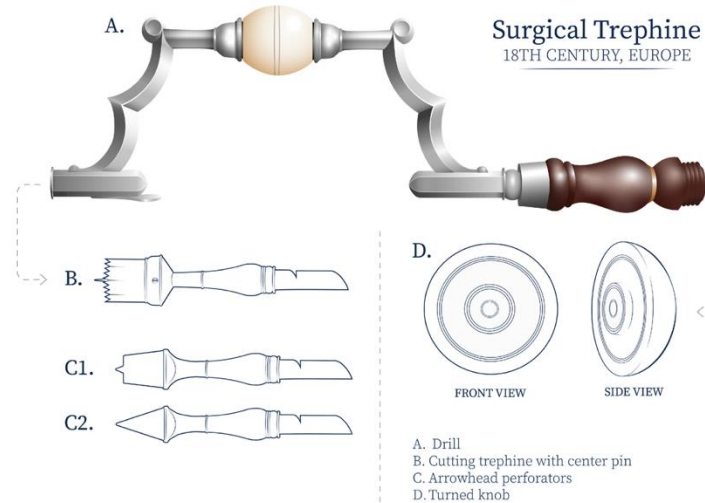


In earlier periods, healers used trepanning to release individuals from evil spirits.

Did you know that...

Archaeologists have found the most trepanned skulls from Incan (1400- 1533) communities Peru. Astonishingly, the percentage of patients that survived trepanning are similar between this time period and the 19th century American civil war. Researchers believe that over time, the Incans improved their technique using shallower, smaller holes that were carefully placed to avoid large amounts of bleeding.

A variety of tools and techniques were available for trepanation. Older tools include flint, stone or metal knives, and obsidian. Healers would use these to groove a circular/oval shape into, scrape away at, or cut (incise) a rectangular shape into the skull. As time progressed so did the complexity of available tools, leading to the use of metal instruments like blades and the trephine (a surgical drill with a cylindrical blade).



- A. Drill
B. Cutting trephine with center pin
C. Arrowhead perforators
D. Turned knob

An illustration of a 18th - 19th century surgical trephine described as a brace and bit. The "bit" refers to the attachments on the left side of the diagram (B-C). Whilst the perforators were as used to create the initial hole, the cutting trephine allowed users to gradually saw through the skull. The "brace" describes the drill frame (A) which the turning knob (D) would attach to, functioning as a handle.



A drawing showing a surgeon using a brace and bit trephine. The person on the right is being prepared for surgery.

As mentioned, trepanning practise eventually began to decline due to the high risk of infection. In the West, this risk was partly due to this operation happening in hospitals rather than in peoples homes. Moreover, as medical knowledge grew, so did the belief that trepanning was inappropriate for conditions for epilepsy and mental illness.

Figure 3. A textbook design integrating the trephine illustration and evil spirit drawing.

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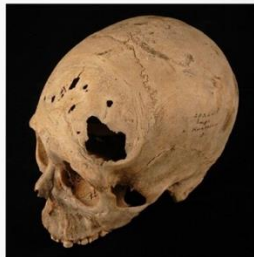
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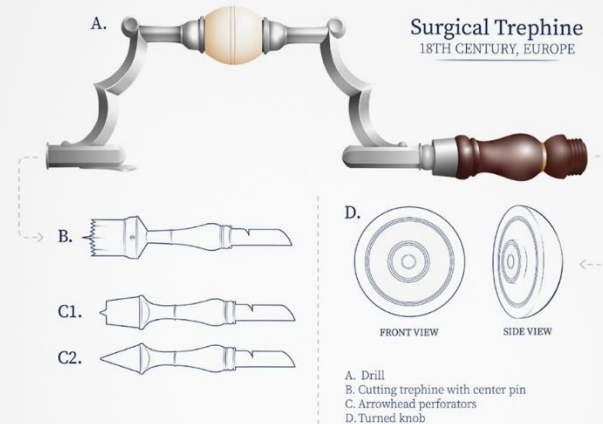


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Figure 4. Textbook mock-up.

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