published in Reader's Digest,
20 June 2017

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brain [2] surgery [3]



I studied anaesthetics at Oxford University for my PhD, but can't really tell you how they work on the brain. In fact, anaesthesia remains a medical mystery.

Your brain contains chemicals (or neurotansmitters) that stimulate the brain, and those that inhibit or calm brain activity. Anaesthetics may switch off brain function by temporarily tipping the balance of brain chemicals in favour of the inhibitory ones; equally possible is that anaesthetics block communication between different parts of the brain.

Whilst not knowing how they work in the brain, we do know what they achieve there.

Switching off consciousness

During anaesthesia, you're in a reversible coma.

Lots of drugs can make you unconscious, including alcohol and morphine, but they are not anaesthetics. Dr Dale of Oxford University makes clear that to qualify as an anaesthetic, "the drug must be readily controllable, so that induction and recovery are rapid, allowing the level of anaesthesia to be adjusted as required during the operation".

Giving anaesthetic by injection is the quickest way to produce unconsciousness (in about 20 seconds), so this is the method most commonly used to put you to sleep on the operating table; during the operation, inhaled anaesthetics generally take over, breathed through a tube.

Switching off movement

As well as being unaware of the operation, you usually need the anaesthetic to make you unresponsive, so that you lie completely still; a muscle-relaxant drug is often also given to enhance this effect.

Until 1846 (when dentist William Morton [4] first used anaesthetic to remove a tooth), patients would struggle under the surgeon's knife: the operation had to happen at lightning speed. Most procedures were simple amputations since the patient would not hang around long enough for deeper delving.

Switching off pain

Queen Victoria famously gave birth to her seventh child under the influence of chloroform (one of the first inhaled anaesthetics).

Sometimes, you don't need to switch off pain. My husband has a spinal cord injury and cannot feel pain in much of his body: he underwent a minor operation without anaesthetic.

Queen Victoria famously gave birth to her seventh child under the influence of chloroform (one of the first inhaled anaesthetics).

Certain brain surgeries such as deep brain stimulation [5] for Parkinson's take place without general anaesthetic. Being awake allows the surgeon to see whether the procedure is helping to reduce the patient's tremor as he moves under instruction; your brain cannot feel pain when it's cut into.

Switching off memory

Low doses of anaesthetic can cause short-term amnesia without causing unconsciousness. You may be given a low dose during endoscopy [6] (when a thin tube with a camera at the end is passed inside your stomach or intestine) to help you tolerate the tube.

Anaesthetics have sadly been misused because of their amnesiac effect. The powerful anaesthetic propofol, nicknamed 'milk of amnesia' by some doctors, was responsible for Michael Jackson's sudden death; Jenson Button [7] is convinced that burglars used anaesthetic during a raid on his villa.

What I do know

Anaesthetists can't tell you how anaesthetics work, but they can perfectly control their actions so that your surgery is over before you know about it.

No need to fear 'accidental awareness' (where you are awake but unable to move under anaesthetic). After almost 50 years of administering anaesthetic, one Oxford anaesthetist has never seen it happen.

"If there is the remotest possibility that you are feeling pain, your body would display this through a rise in blood pressure or heart rate; you might even sweat or shed a tear. The anaesthetist would promptly respond by deepening the level of anaesthetic", he reassures. "During anaesthesia, you are being monitored more closely than at any other time in your life". It's a welcome surveillance that ensures your safety.

MEDICAL JOURNALISTS' ASSOCIATION

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