

Volatile vs Total Intravenous Anaesthesia for Major Non-cardiac Surgery (VITAL) Trial

Is one type of general anaesthesia better than another for older adults having major surgery?

This summary uses a few technical terms: general anaesthesia (medicine that puts the whole body to sleep for an operation), and non-cardiac surgery (surgery that does not involve the heart).

Why we did this study

Every year, many older adults have major surgery and are then given general anaesthesia to keep them safely asleep during the operation. There are two common ways to deliver this: as a continuous infusion of medicine (usually propofol) through a vein, known as total intravenous anaesthesia (TIVA), or as a gas that is breathed in, known as volatile or inhalational anaesthesia. Doctors have long debated whether one method helps patients recover better or more safely than the other, especially in older adults, who are more likely to experience complications after surgery, as explained further below. The VITAL trial was designed to find out.

What we did

We enrolled 2,508 adults aged 50 and over who were having planned major surgery (not emergency surgery) at 49 NHS hospitals across the UK. Participants were randomly assigned to one of the two groups using a computer-generated schedule, similar to an electronic coin toss, so that neither the research team nor the patients could influence which treatment a person received. About half received TIVA through an intravenous infusion, and about half received anaesthesia through gas they breathed in. We then tracked how people recovered over the following six months.

What we found

Thirty days after surgery, people in both groups had spent almost the same number of days alive and out of hospital — an average of about 22 days in each group. There was also no meaningful difference between the two groups in how people were doing at 90 days, in survival rates at 30 days, 90 days, or 6 months, or in how people rated their overall recovery.

We did notice some differences in comfort right after surgery. People who received TIVA were less likely to report a dry, hoarse throat, or nausea and vomiting the day after their operation.

Complications that were serious enough to need extra treatment or that affected a person's recovery — for example, infections or heart problems — affected around 1 in 8 of the 2,446 patients in this study, with similar rates in both groups. Episodes of post-surgery confusion, and rare instances of a patient unintentionally becoming aware during anaesthesia, were also uncommon in both groups, based on agreed clinical definitions for these events.

What this means

Neither anaesthesia method proved better at helping people leave hospital sooner or survive longer after major surgery. This study was carried out only in UK hospitals and only for planned (non-emergency) surgery, so the results may not apply everywhere or to every type of operation; it also did not examine long-term cancer outcomes or the cost of each approach.

However, the intravenous approach (TIVA) may offer a modest advantage in reducing certain unpleasant symptoms in the first day after surgery, which may matter to patients and their care teams when planning surgery. Patients and members of the public helped shape this study from the outset, and their input will continue to guide how we investigate these questions further, including comparing costs and longer-term outcomes in future research — work that we hope will keep improving the surgical experience for older adults.