

## The benefits of epidural analgesia in heart surgery

Epidural analgesia is a common procedure performed by anesthesiologists to relieve pain during childbirth or in surgery. It is performed by inserting a small catheter in a specific area of the spine known as the epidural space, and injecting local anesthetics or other drugs through the catheter.

Epidural analgesia has been demonstrated to be advantageous in a broad range of surgeries, improving analgesia and reducing the risk of pulmonary complications. Its major drawback is the very rare but severe complication of epidural hematoma with long term neurological damage.

While in other surgical settings the risk benefit/ratio is in favor of epidural, in heart surgery there is debate on its utility. Epidurals may have advantageous effects after heart surgery, however the risk of neurological complications may be increased due to the drugs used to prevent clotting of blood during the use of heart-lung machine. However, the real incidence of epidural hematoma in cardiac surgery is unknown, as is the real effect (harm or benefit) of this technique due to the small sample size of published studies, that did not reach sufficient statistical power to draw conclusions.

To answer this open question, we performed a systematic review of published studies, employing a dedicated statistical technique known as meta-analysis, to reach a sample size and thus a statistical power sufficiently large to detect the real effect of epidurals in cardiac surgery. Moreover, we conducted a worldwide survey to estimate for the first time the real incidence of epidural hematoma in heart surgery.

Our study found that the use of epidural in cardiac surgery reduces the risk of death, the length of mechanical ventilation (breathing replaced by a dedicated machine) and the risk of myocardial infarction. We found that for every 70 epidurals placed in heart surgery, one death could be prevented, thus saving one life. Conversely, one epidural hematoma and neurological damage will occur every 3552, which confirms the relative safety of epidural use in cardiac surgery.

The mechanism for a reduction in mortality with epidural is not clearly defined. Beside pain relief, epidurals blunt the stress response to surgery, improving coronary artery dilatation and heart oxygen delivery. These hypotheses are confirmed by our study, that detected a reduction in myocardial infarction occurrence using epidural analgesia, and this may justify the reduction in mortality observed in this study. Moreover, epidurals may reduce stress-induced immunosuppression, and allow a lower dose of general anesthesia, lowering risks and reaching faster recovery through this indirect effect.

In conclusion, our data show that in heart surgery the risk of death is lower when using an epidural as part of the anesthetic technique, with 1 death prevented for every 70 epidurals placed. This benefit should be balanced against the risk of major neurologic complications (1 epidural hematoma every 3552 epidurals placed as estimated from our study). The decision to add or not epidural to standard anesthesia in cardiac surgery should be a local decision based on expertise and discussion with the patient.

## Publication

[Benefits and risks of epidural analgesia in cardiac surgery.](#)

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