# Lessons from Pearl Harbor: general anaesthesia for caesarean section in the Rotunda in the 1940s

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## Background

Anaesthesia for caesarean section has changed profoundly over the past two centuries. Before the 1940's, obstetric anaesthesia relied on a limited range of inhalational agents (ether, nitrous oxide and cyclopropane), often administered as single-agents with minimal monitoring. Flammability, slow onset, respiratory depression and nausea and vomiting were significant problems with use.

Intravenous (IV) thiopental represented a major advance with rapid induction of anaesthesia. But early use exposed significant dangers – following the attack on Pearl Harbor in 1941, it is estimated that hundreds died from anaesthesia administered to treat injuries vs the bombing itself. IV thiopental was given to shocked soldiers by inexperienced personnel without adequate specialist training, causing deaths from respiratory arrest and cardiovascular collapse.

## Methods

A review of three consecutive historical annual reports from 1947—50 was conducted to describe anaesthetic technique for CS and examine the transition from volatile to IV induction techniques.

## Results

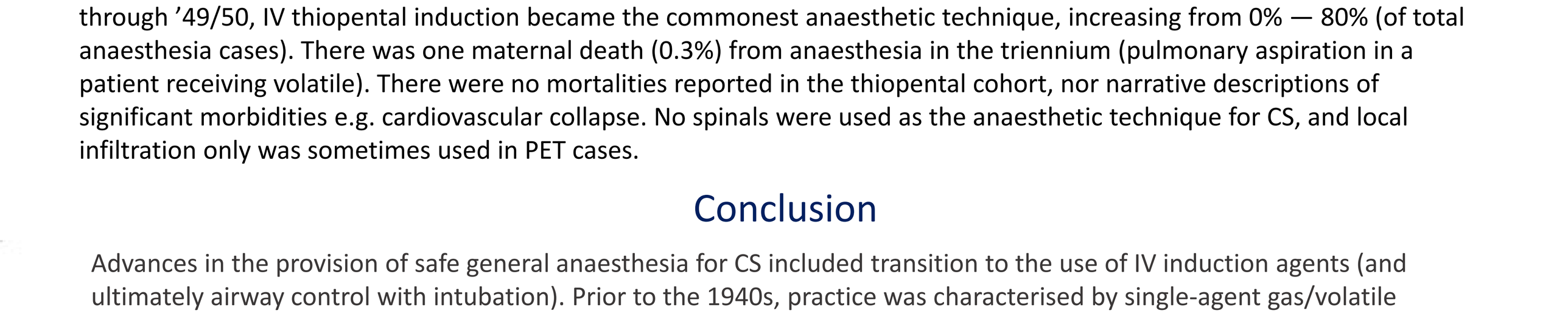
| Year | CS (n) as % of all deliveries | Total general anaesthesia n (%) | **GA**: Gas/volatile induction n (%) | **GA**: IV Thiopental induction n (%) | Local infiltration n (%) | Spinal anaesthesia n (%) | No anaesthetic n (%) |
|---|---|---|---|---|---|---|---|
| 1947 | 95 (2.4%) | 94 (99%) | 94 (99%) | 0 | 0 | 0 | 1 (1%) |
| 1948 | 113 (2.8%) | 100 (88%) | 75 (66%) | 25 (22%) | 7 (6%) | 0 | 3 (3%) |
| 1949 | 131 (3.3%) | 113 (86%) | 8 (6%) | 105 (80%) | 17 (13%) | 0 | 0 |

*Numbers do not always add to 100% because of some missing records*

Two consulting anaesthetists with two assistants worked in the hospital for the period in question. CS absolute numbers (and percentage of total deliveries) increased in sequential reports, the vast majority under general anaesthesia. From '47/48 through '49/50, IV thiopental induction became the commonest anaesthetic technique, increasing from 0% — 80% (of total anaesthesia cases). There was one maternal death (0.3%) from anaesthesia in the triennium (pulmonary aspiration in a patient receiving volatile). There were no mortalities reported in the thiopental cohort, nor narrative descriptions of significant morbidities e.g. cardiovascular collapse. No spinals were used as the anaesthetic technique for CS, and local infiltration only was sometimes used in PET cases.

## Conclusion

Advances in the provision of safe general anaesthesia for CS included transition to the use of IV induction agents (and ultimately airway control with intubation). Prior to the 1940s, practice was characterised by single-agent gas/volatile techniques. The introduction of new IV agents revealed safety/mortality problems in trauma settings when used by nurse anaesthetists and untrained military physicians. The introduction of IV thiopental in the Rotunda in the late 1940s, administered by trained anesthesiologists, paved the way for safer, specialised modern obstetric anaesthesia care, without complications associated with the early use of IV agents in other settings.



## References

1. *Annual reports of the Rotunda Hospital 1947 – 1950*

2. *Crowhurst, J.A. (2016) The legacy of the anaesthesia 'events' at Pearl Harbor, 7th December 1941. Journal of Military and Veterans' Health, 24(2), pp. 52–57.*

3. *Fisher, C. (1998) Anesthetic agents of the forties and fifties. The Permanente Journal, 2(1), pp. 61–62.*