

Cardiac arrest in a pregnant patient caused by coronary artery vasospasm due to ergometrine

Dr Divya Iyer
MD BPharm (Hons), ANZCA Provisional Fellow

Background and Introduction

Why This Matters

- Ergometrine is a World Health Organisation (WHO) essential uterotonic for postpartum haemorrhage (PPH) management.¹
- Its α 1-adrenergic properties can precipitate profound coronary artery vasospasm (CAS) — even in patients without pre-existing cardiac disease.

A Growing Risk

- As the obstetric population increasingly presents with cardiometabolic risk factors (obesity, advanced maternal age), the incidence of this life-threatening complication may rise.
- Highlighting this a case of ergometrine induced vasospasm resulting in myocardial infarction and stroke has recently been reported in the European Heart Journal in 2025.²

Rationale for Case Presentation

The Gap

- The Australian and New Zealand Committee on Resuscitation (ANZCOR) / American Heart Association (AHA) Advanced Life Support (ALS) protocols list reversible causes of cardiac arrest as the ‘4Hs and 4T’s’.³
- Recently the European Resuscitation Council (ERC) has added the ‘4Ps’ for obstetric arrest to the existing memory aid — acknowledging that pregnancy-specific causes of arrest warranted their own category. These include pre-eclampsia, peripartum cardiomyopathy, purpureal sepsis, placental and uterine complications.⁴
- Currently, this change has not yet been adapted by ANZCOR.
- Coronary artery vasospasm - a critical, potentially reversible cause of maternal arrest that is currently overlooked - is not explicitly included in either memory aid.

Objective

- We report a case of prolonged cardiac arrest secondary to ergometrine-induced CAS and propose an update to existing ALS memory aids and management algorithms.

Dr Sze Ying Ng
MBBS BMedSci FANZCA MMed(Crit Care)

Case Presentation

Presentation

- 39-year-old G4P3 female, body mass index (BMI) 52 kg.m⁻², presented with fetal demise at 18 weeks' gestation and major postpartum haemorrhage (2,500 mL).
- Rapid sequence induction (RSI) was performed for manual placental removal under general anaesthesia.

Trigger

- 250 microg of ergometrine was administered intramuscularly (IM) and the remaining 250 microg was given in small intravenous (IV) aliquots for refractory uterine atony.
- In the subsequent 10 minutes dynamic ST-segment elevation developed on intraoperative cardiac monitoring.
- Haemoglobin remained stable at 105 g.L⁻¹ with no electrolyte derangements.

Cardiac Arrest

- ST changes subsequently deteriorated to ventricular tachycardia then ventricular fibrillation and cardiac arrest was called.
- Cardiopulmonary resuscitation was commenced with chest compressions and defibrillations conducted as per advanced life support (ALS) protocols.
- Maternal ALS protocol was followed for 29 minutes: 7 × 200J biphasic shocks, adrenaline, amiodarone, lignocaine, and sodium bicarbonate were delivered.
- Coronary vasospasm - notably not represented in the traditional 4H’s and 4T’s memory aid - was considered the most likely aetiology (Figure 1).

Diagnosis & Treatment

- Following return of spontaneous circulation (ROSC) the patient remained intubated, ventilated and under general anaesthesia and was transferred to the angiography suite.
- Urgent coronary angiography confirmed active right coronary artery (RCA) spasm. Resolution occurred with intracoronary and intravenous glyceryl trinitrate (GTN).

Outcome

- Patient was discharged on day four with no neurological or cardiac sequelae - a remarkable outcome following 29 minutes of cardiac arrest.

Professor Alicia Dennis
MBBS PhD MPH PGDipEcho FANZCA GAICD

Proposed Memory Aid

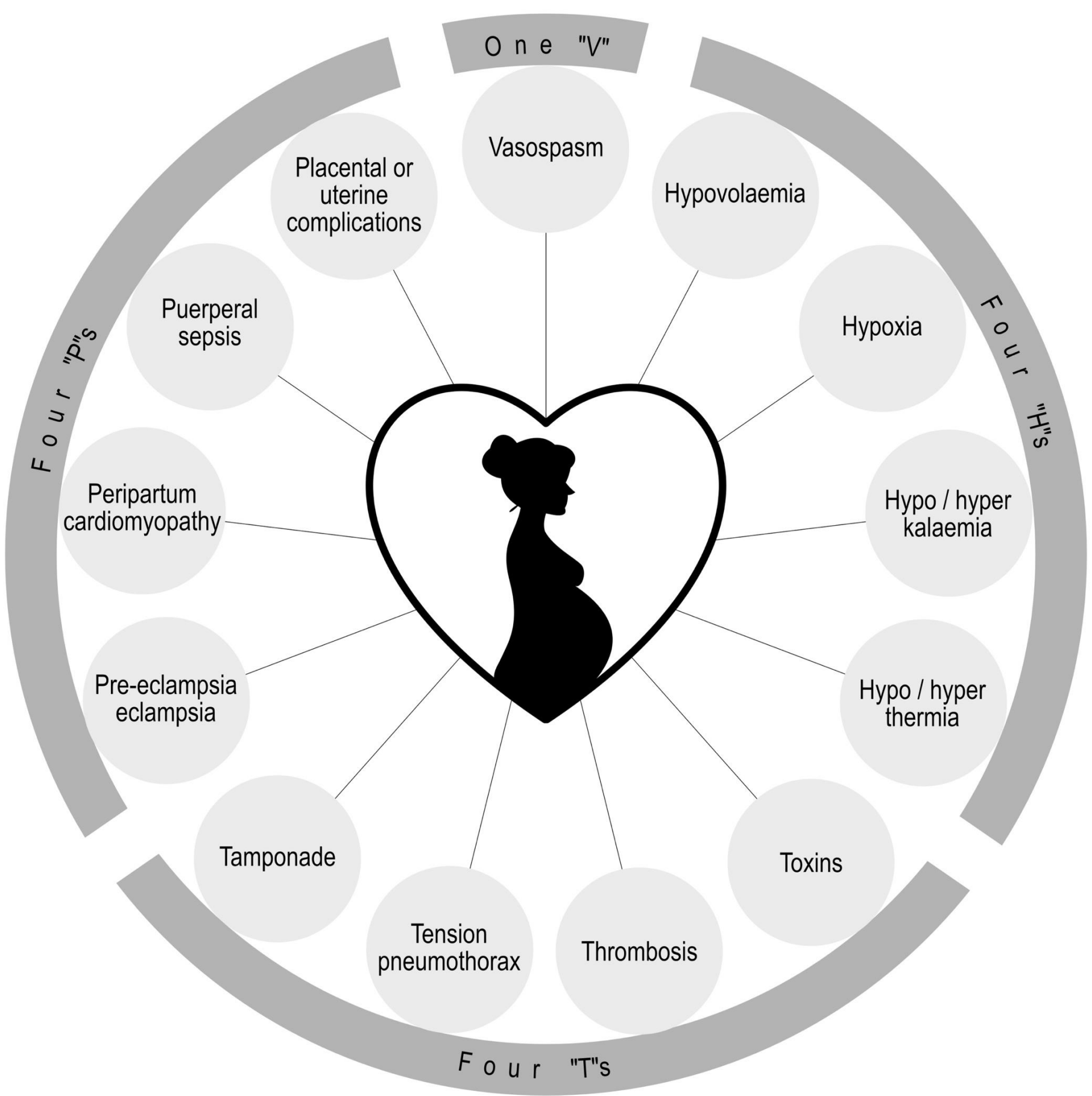


Figure 1. Proposed reversible causes of cardiac arrest in pregnancy – 4H’s, 4T’s, 4Ps and 1V

Key Messages

- Key Message 1:** Ergometrine can precipitate life-threatening coronary artery vasospasm and cardiac arrest — even in patients without known cardiac disease.
- Key Message 2:** Vasospasm is reversible with prompt recognition, nitrates, and early coronary angiography. Delay in diagnosis is the primary threat to survival.
- Key Message 3:** Consider adding ‘1V — Vasospasm’ to the existing ALS ‘4Hs, 4Ts and 4P’s’ memory aid for all cases of maternal cardiac arrest following uterotonic use.
- Key Message 4:** With increasing maternal obesity and advanced maternal age, cardiometabolic risk factors are more prevalent in the obstetric population. Vigilance for CAS after ergometrine must increase accordingly.

References:

- 1- World Health Organisation (2023) <https://iris.who.int/bitstream/handle/10665/371090/WHO-MHP-HPS-EML-2023.02-eng.pdf?sequence=1&isAllowed=y>
- 2- European Heart Journal: Case Reports, 9(3), p. ytaf087. doi: 10.1093/ehjcr/ytaf087.
- 3- Australian and New Zealand Committee on Resuscitation (ANZCOR) (2026) <https://www.anzcor.org/home/adult-advanced-life-support/guideline-11-10-resuscitation-in-special-circumstances>
- 4- European Resuscitation Council Guidelines 2025: Special Circumstances in Resuscitation', Resuscitation, 215(Suppl 1), p. 110753.

Acknowledgments:

Figure 1 - Google. (2026). Gemini <http://gemini.google.com> to assist with Figure 1 from the prompt “Please create a figure of a pregnant woman inside a heart” then completed figure using software Affinity Designer.