RESPIRATORY SYSTEM

Perioperative Anaphylaxis

Intraoperative teaching · CA-2

THE QUESTION

Where the evidence disagrees

This topic was selected because an evidence synthesis beats a textbook on it: the trials disagree, or the guidance has moved recently.

THE EVIDENCE

What each source contributes, and how strong it is

Study design first — a cohort and a randomised trial do not carry the same weight.

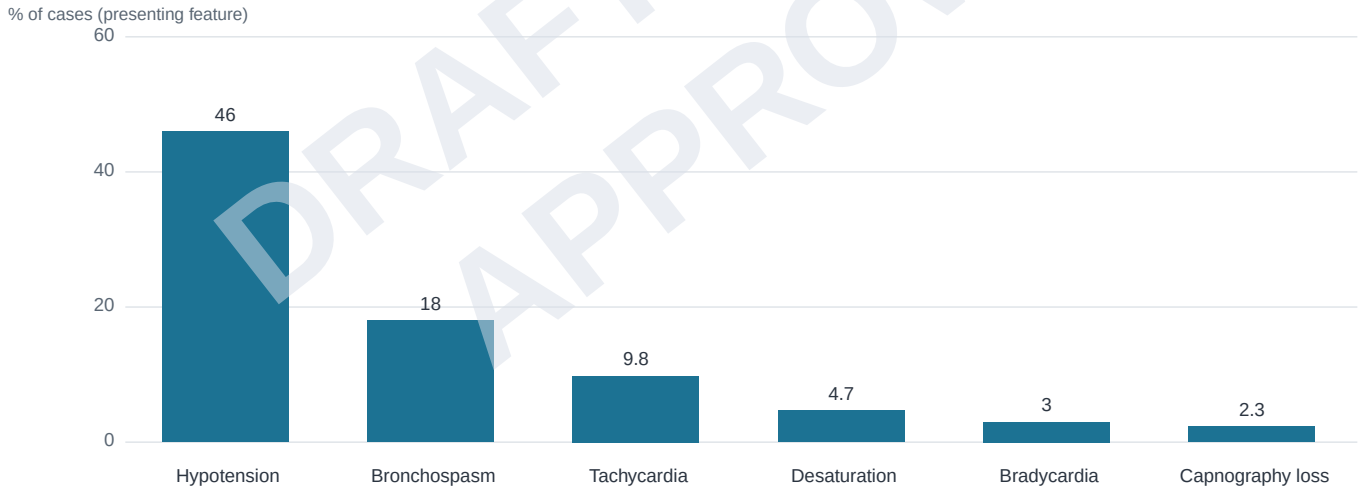
Design	Year	Journal	What it found
Other	2015	Current allergy and asthma reports	Grades III/IV are life-threatening anaphylaxis
Other	2019	The journal of allergy and clinica	Perioperative anaphylaxis: Diagnosis challenged by environment/medications
Other	2020	Der Anaesthesist	Inject epinephrine rapidly for suspected perioperative anaphylaxis
Other	2021	Paediatric anaesthesia	Pediatric perioperative anaphylaxis: Main triggers are drugs

4 resolved citations behind this deck; every point above traces to one of them.

THE NUMBERS

It presents as hypotension far more often than as a rash

Every patient in NAP6 was hypotensive at some point in the episode.



Waiting for a cutaneous sign is waiting for something that may never arrive. Sudden hypotension under anaesthesia is the presentation.

NAP6, Br J Anaesth 2018 · PMID 29935567

IN PRACTICE

What the cohorts and reviews add

4 findings, each on the slide that follows.

CURRENT ALLERGY AND ASTHMA REPORTS 2015

Grades III/IV are life-threatening anaphylaxis

Grades III and IV on the Ring and Messmer scale represent life-threatening perioperative immediate hypersensitivity reactions referred to as…

Perioperative anaphylaxis: Diagnosis challenged by environment/medications

Perioperative anaphylaxis is often caused by medications used in anesthesia and surgery, making diagnosis challenging due to the unique environment…

DER ANAESTHESIST 2020

Inject epinephrine rapidly for suspected perioperative anaphylaxis

Epinephrine should be rapidly injected for suspected perioperative anaphylaxis, alongside intravenous fluids.

PAEDIATRIC ANAESTHESIA 2021

Pediatric perioperative anaphylaxis: Main triggers are drugs

In pediatric patients, antibiotics, neuromuscular blocking agents

IN PRACTICE

Grades III/IV are life-threatening anaphylaxis

Other · Current allergy and asthma reports

Grades III and IV on the Ring and Messmer scale represent life-threatening perioperative immediate hypersensitivity reactions referred to as anaphylaxis.

Perioperative anaphylaxis: what should be known?, Current allergy and asthma reports 2015 · PMID 26139330

IN PRACTICE

Perioperative anaphylaxis: Diagnosis challenged by environment/medications

Other · The journal of allergy and clinica

Perioperative anaphylaxis is often caused by medications used in anesthesia and surgery, making diagnosis challenging due to the unique environment and multiple substances involved.

Identification and Management of Perioperative Anaphylaxis, The journal of allergy and clinical immunology. In practice 2019 · PMID 31154032

IN PRACTICE

Inject epinephrine rapidly for suspected perioperative anaphylaxis

Other · Der Anaesthesist

Epinephrine should be rapidly injected for suspected perioperative anaphylaxis, alongside intravenous fluids.

[Management of perioperative anaphylaxis], Der Anaesthesist 2020 · PMID 32757033

IN PRACTICE

Pediatric perioperative anaphylaxis: Main triggers are drugs

Other · Paediatric anaesthesia

In pediatric patients, antibiotics, neuromuscular blocking agents, and opioid analgesics are the main triggers for perioperative anaphylaxis.

Perioperative anaphylaxis in children: A report from the Wake-Up Safe collaborative, Paediatric anaesthesia 2021 · PMID 33141983

IN THE ROOM

What this changes about the next case

Colour is the strength of the evidence behind each step, not the urgency.

1. **1**
   Grades III and IV on the Ring and Messmer scale represent life-threatening perioperative immediate hypersensitivity reactions referred to as anaphylaxis.
2. **2**
   Perioperative anaphylaxis is often caused by medications used in anesthesia and surgery, making diagnosis challenging due to the unique environment and multiple substances involved.
3. **3**
   Epinephrine should be rapidly injected for suspected perioperative anaphylaxis, alongside intravenous fluids.
4. **4**
   In pediatric patients, antibiotics, neuromuscular blocking agents, and opioid analgesics are the main triggers for perioperative anaphylaxis.

KEY TAKEAWAYS

What to carry into the next case

Grades III/IV are life-threatening anaphylaxis
Current allergy and asthma reports 2015

Perioperative anaphylaxis: Diagnosis challenged by environment/medications

Inject epinephrine rapidly for suspected perioperative anaphylaxis
Der Anaesthesist 2020

Pediatric perioperative anaphylaxis: Main triggers are drugs
Paediatric anaesthesia 2021

For suspected perioperative anaphylaxis (Ring & Messmer III/IV), immediately administer epinephrine and IV fluids.

QUESTIONS I'LL ASK YOU IN THE ROOM

1. What is the most common trigger for anaphylaxis during anesthesia?
2. How does the timing of onset typically differentiate between IgE-mediated and non-IgE-mediated reactions?
3. What hemodynamic changes are characteristic of anaphylaxis that might differ from typical anesthetic responses?
4. Besides epinephrine, what other immediate interventions are crucial in managing perioperative anaphylaxis?

ORAL BOARDS STEM

> *Shortly after induction and rocuronium, the airway pressure rises sharply, the blood pressure falls to 55/30, and a rash is visible on the chest.*

BOARD QUESTIONS

1. In NAP6, the UK national audit of 266 Grade 3-5 perioperative anaphylaxis reports, what was the commonest presenting feature?
   A. Hypotension, in 46% of cases
   B. Bronchospasm, in 46% of cases
   C. Urticaria or rash, in about a third of cases
   D. Oxygen desaturation, in about a quarter of cases

2. Which agents accounted for most identified culprits in NAP6, and what was the estimated incidence of perioperative anaphylaxis?

3. NAP6 found particular patient factors associated with poor outcome, and a characteristic cardiac arrest rhythm. What were they, and how should that change your management?

ANSWER KEY

1. A. Hypotension, in 46% of cases

Hypotension 46%, bronchospasm 18%, tachycardia 9.8%, desaturation 4.7%, bradycardia 3%, lost capnography trace 2.3%. Every patient in the audit was hypotensive at some point during the episode. Cutaneous signs are not how this announces itself under anaesthesia.

NAP6, Br J Anaesth 2018 · PMID 29935567

2. Of 199 identified culprit agents, antibiotics accounted for 94, neuromuscular blocking agents 65, chlorhexidine 18 and Patent Blue dye 9. The estimated incidence was approximately 1 in 10,000 anaesthetics, though the authors note the true incidence may be around 70% higher because of reporting delays and incomplete data.

Antibiotics were the leading identified culprit in this audit, ahead of neuromuscular blocking agents. Teicoplanin was only 12% of antibiotic exposures but caused 38% of antibiotic-induced anaphylaxis.

NAP6, Br J Anaesth 2018 · PMID 29935567

3. Poor outcomes were associated with higher ASA grade, obesity, and treatment with beta blockers or ACE inhibitors. Pulseless electrical activity was the usual type of cardiac arrest, often with bradycardia, and there were 10 deaths and 40 cardiac arrests among 266 reports. The implication for management is that you should expect PEA with bradycardia rather than a shockable rhythm, and that the audit found worse outcomes among patients on beta blockers or ACE inhibitors, among those with higher ASA grade, and among those with obesity.

NAP6 reports these as associations with poor outcome, not as a tested mechanism or treatment strategy. Expect PEA with bradycardia rather than a shockable rhythm.

NAP6, Br J Anaesth 2018 · PMID 29935567

For suspected perioperative anaphylaxis (Ring & Messmer III/IV), immediately administer epinephrine and IV fluids.

SOURCES

[1] Perioperative anaphylaxis: what should be known?, Current allergy and asthma reports 2015 · PMID 26139330
[2] Identification and Management of Perioperative Anaphylaxis, The journal of allergy and clinical immunology. In practice 2019 · PMID 31154032
[3] [Management of perioperative anaphylaxis], Der Anaesthesist 2020 · PMID 32757033

[4] Perioperative anaphylaxis in children: A report from the Wake-Up Safe collaborative, Paediatric anaesthesia 2021 · PMID 33141983
[5] NAP6, Br J Anaesth 2018 · PMID 29935567