PAINFUL DISEASE STATES

Perioperative Dexamethasone

Intraoperative teaching · CA-1

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
Meta-analysis	2011	Anesthesiology	For analgesia rather than antiemesis the dose matters
Randomised trial	2012	JAMA	High-dose dexamethasone at 1 mg/kg in cardiac surgery did not reduce 30-day major
Cohort	2019	BMC cancer	In 2,628 breast cancer operations, a single perioperative dexamethasone dose was not
Meta-analysis	2013	Anesthesia and analgesia	Pooled across 60 trials, 4-5 mg of dexamethasone reduced 24-hour nausea and vomiting
Randomised trial	2021	The New England journal of medicin	In PADDI, 8 mg of dexamethasone was noninferior to placebo for surgical-site
Cohort	2023	Annals of surgery	Among 30,561 oncologic resections, dexamethasone was associated with lower 1-year

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

WHERE THE GUIDANCE SITS

What the guidelines and pooled evidence say

2 findings, each on the slide that follows.

ANESTHESIOLOGY 2011

For analgesia rather than antiemesis the dose matters

For analgesia rather than antiemesis the dose matters: doses above 0.1 mg/kg reduced pain and opioid consumption, low doses did not

ANESTHESIA AND ANALGESIA 2013

Pooled across 60 trials, 4-5 mg of dexamethasone reduced 24-hour nausea and vomiting

Pooled across 60 trials, 4-5 mg of dexamethasone reduced 24-hour nausea and vomiting as effectively as 8-10 mg, supporting the lower…

WHERE THE GUIDANCE SITS

For analgesia rather than antiemesis the dose matters

Meta-analysis · Anesthesiology

For analgesia rather than antiemesis the dose matters: doses above 0.1 mg/kg reduced pain and opioid consumption, low doses did not, and preoperative administration gave a more consistent effect than intraoperative.

Perioperative Single Dose Systemic Dexamethasone for Postoperative Pain: A Meta-Analysis of Randomized Controlled Trials, Anesthesiology 2011 · PMID 21799397

WHERE THE GUIDANCE SITS

Pooled across 60 trials, 4-5 mg of dexamethasone reduced 24-hour nausea and vomiting

Meta-analysis · Anesthesia and analgesia

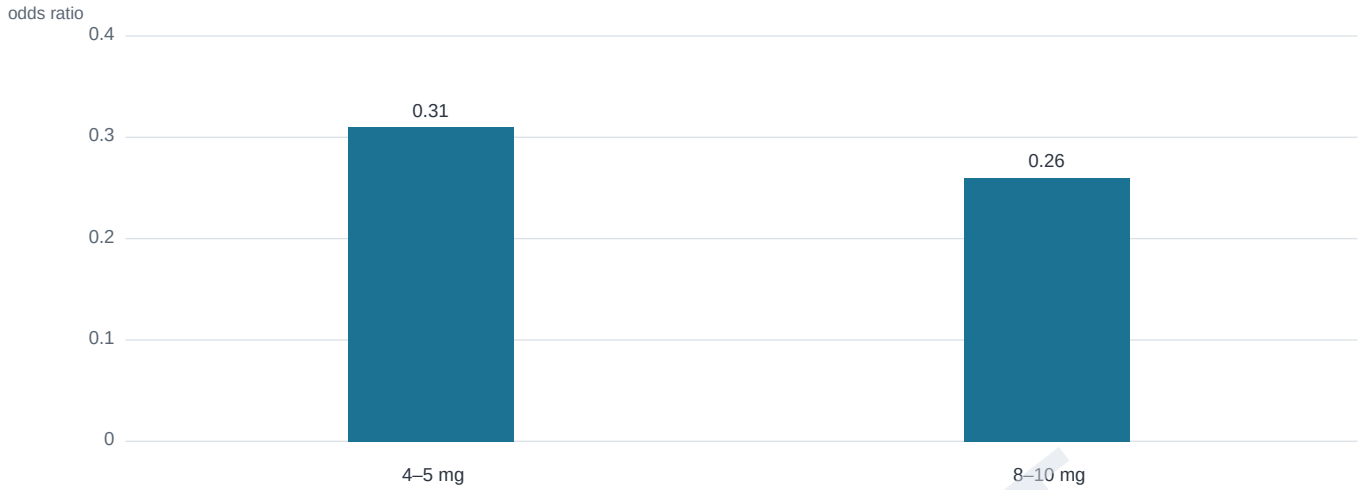
Pooled across 60 trials, 4-5 mg of dexamethasone reduced 24-hour nausea and vomiting as effectively as 8-10 mg, supporting the lower SAMBA-recommended dose.

Dexamethasone to Prevent Postoperative Nausea and Vomiting: An Updated Meta-Analysis of Randomized Controlled Trials, Anesthesia and analgesia 2013 · PMID 23223115

THE NUMBERS

4–5 mg works as well as 8–10 mg for nausea

60 trials, 6,696 patients.



No clinical advantage to the higher dose for nausea — which matters, because the glycaemic effect is dose-related.

Dexamethasone to Prevent Postoperative Nausea and Vomiting: An Updated Meta-Analysis of Randomized Controlled Trials, Anesthesia and analgesia 2013 · PMID 23223115

WHAT THE TRIALS FOUND

Where randomised evidence moved the question

2 findings, each on the slide that follows.

JAMA 2012

High-dose dexamethasone at 1 mg/kg in cardiac surgery did not reduce 30-day major

High-dose dexamethasone at 1 mg/kg in cardiac surgery did not reduce 30-day major adverse events (7.0% versus 8.5%); it lowered infection and…

THE NEW ENGLAND JOURNAL OF MEDICINE 2021

In PADDI, 8 mg of dexamethasone was noninferior to placebo for surgical-site

In PADDI, 8 mg of dexamethasone was noninferior to placebo for surgical-site infection at 30 days (8.1% versus 9.1%), including in patients with…

WHAT THE TRIALS FOUND

High-dose dexamethasone at 1 mg/kg in cardiac surgery did not reduce 30-day major

Randomised trial · JAMA

High-dose dexamethasone at 1 mg/kg in cardiac surgery did not reduce 30-day major adverse events (7.0% versus 8.5%); it lowered infection and ventilation time but raised postoperative glucose.

Intraoperative High-Dose Dexamethasone for Cardiac Surgery: A Randomized Controlled Trial, JAMA 2012 · PMID 23117776

WHAT THE TRIALS FOUND

In PADDI, 8 mg of dexamethasone was noninferior to placebo for surgical-site

Randomised trial · The New England journal of medicin

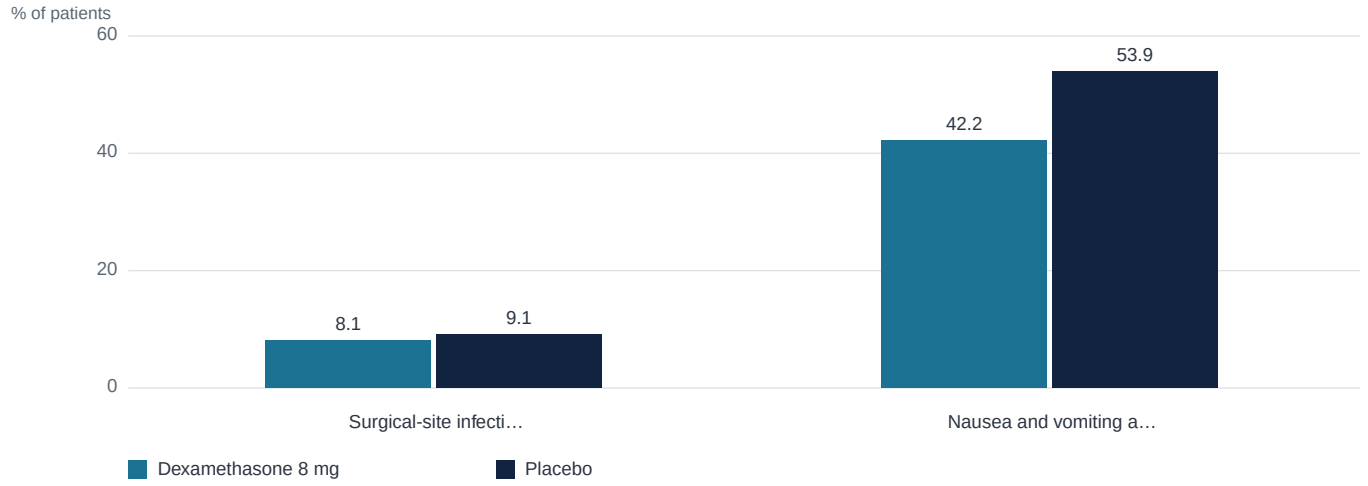
In PADDI, 8 mg of dexamethasone was noninferior to placebo for surgical-site infection at 30 days (8.1% versus 9.1%), including in patients with diabetes, while cutting nausea and vomiting from 53.9% to 42.2%.

Dexamethasone and Surgical-Site Infection, The New England journal of medicine 2021 · PMID 33951362

THE NUMBERS

PADDI: no excess surgical-site infection, including in diabetes

8,725 patients, 8 mg at induction.



PADDI showed a single 8 mg dose was noninferior for 30-day surgical-site infection, including in patients with diabetes — that specific question, at that dose.

Dexamethasone and Surgical-Site Infection, The New England journal of medicine 2021 · PMID 33951362

IN PRACTICE

What the cohorts and reviews add

2 findings, each on the slide that follows.

BMC CANCER 2019

In 2,628 breast cancer operations, a single perioperative dexamethasone dose was not

In 2,628 breast cancer operations, a single perioperative dexamethasone dose was not associated with increased recurrence or mortality on…

ANNALS OF SURGERY 2023

Among 30,561 oncologic resections, dexamethasone was associated with lower 1-year

Among 30,561 oncologic resections, dexamethasone was associated with lower 1-year mortality and better recurrence-free survival

IN PRACTICE

In 2,628 breast cancer operations, a single perioperative dexamethasone dose was not

Cohort · BMC cancer

In 2,628 breast cancer operations, a single perioperative dexamethasone dose was not associated with increased recurrence or mortality on propensity-matched analysis.

Single Dose of Dexamethasone Is Not Associated With Postoperative Recurrence and Mortality in Breast Cancer Patients: A Propensity-Matched Cohort Study, BMC cancer 2019 · PMID 30894164

IN PRACTICE

Among 30,561 oncologic resections, dexamethasone was associated with lower 1-year

Cohort · Annals of surgery

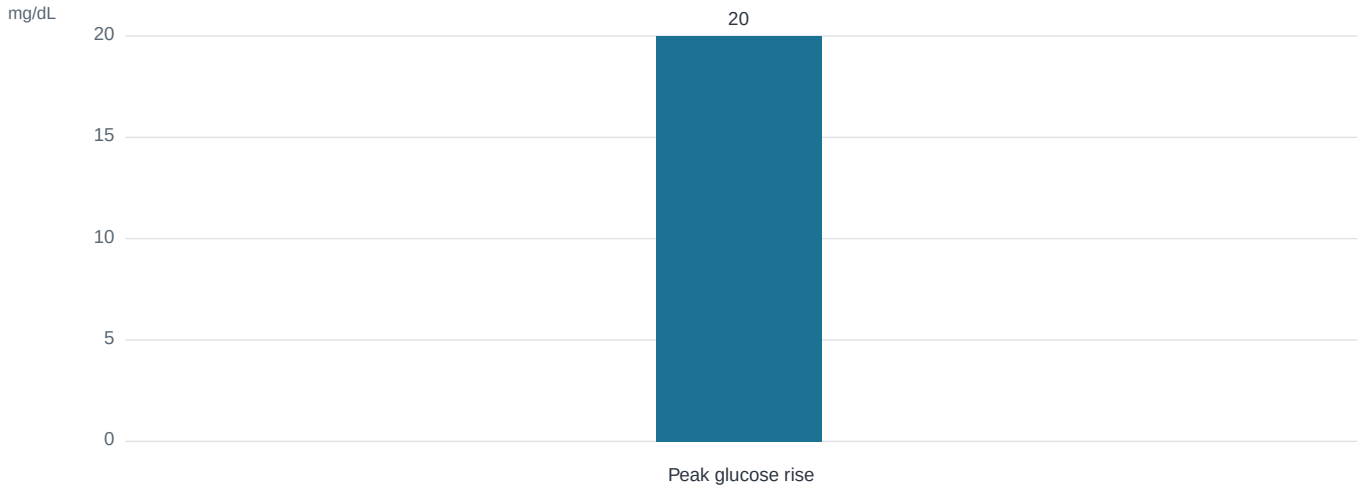
Among 30,561 oncologic resections, dexamethasone was associated with lower 1-year mortality and better recurrence-free survival, while doses above 0.09 mg/kg raised hyperglycaemia without raising surgical-site infection.

Association Between Intraoperative Dexamethasone and Postoperative Mortality in Patients Undergoing Oncologic Surgery: A Multicentric Cohort Study, Annals of surgery 2023 · PMID 35837889

THE NUMBERS

The glucose rise is real and small

56 trials, peak perioperative glucose.



About 20 mg/dL, with no dose-effect relationship apparent and no increase in wound infection.

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**
   For analgesia rather than antiemesis the dose matters: doses above 0.1 mg/kg reduced pain and opioid consumption, low doses did not, and preoperative administration gave a more consistent effect than intraoperative.
2. **2**
   Pooled across 60 trials, 4-5 mg of dexamethasone reduced 24-hour nausea and vomiting as effectively as 8-10 mg, supporting the lower SAMBA-recommended dose.
3. **3**
   High-dose dexamethasone at 1 mg/kg in cardiac surgery did not reduce 30-day major adverse events (7.0% versus 8.5%); it lowered infection and ventilation time but raised postoperative glucose.
4. **4**
   In PADDI, 8 mg of dexamethasone was noninferior to placebo for surgical-site infection at 30 days (8.1% versus 9.1%), including in patients with diabetes, while cutting nausea and vomiting from 53.9% to 42.2%.
5. **5**
   In 2,628 breast cancer operations, a single perioperative dexamethasone dose was not associated with increased recurrence or mortality on propensity-matched analysis.

KEY TAKEAWAYS

What to carry into the next case

> **For analgesia rather than antiemesis the dose matters**
> Anesthesiology 2011

> **High-dose dexamethasone at 1 mg/kg in cardiac surgery did not reduce 30-day major**
> JAMA 2012

> **In 2,628 breast cancer operations, a single perioperative dexamethasone dose was not**
> BMC cancer 2019

> **Pooled across 60 trials, 4-5 mg of dexamethasone reduced 24-hour nausea and vomiting**
> Anesthesia and analgesia 2013

For analgesia rather than antiemesis the dose matters

QUESTIONS I'LL ASK YOU IN THE ROOM

1. Walk me through your setup for this before we start.
2. What are you watching on the monitor that would tell you this is going wrong?

3. What is your first move if it does?
4. What would you want ready in the room before induction?

ORAL BOARDS STEM

> *A 58-year-old with type 2 diabetes and an HbA1c of 8.4% presents for laparoscopic cholecystectomy. You would normally give dexamethasone for nausea, and the resident queries the glucose.*

BOARD QUESTIONS

1. In a pooled analysis of 60 randomised trials of dexamethasone for postoperative nausea and vomiting, how did 4-5 mg compare with 8-10 mg for nausea and vomiting in the first 24 hours, and which dose recommendation does that support?

2. In the PADDI trial, 8 mg of dexamethasone was compared with placebo. State the 30-day surgical-site infection result with its rates, name the type of statistical comparison used for that outcome, say whether it held in patients with diabetes, and give the effect on nausea and vomiting.

3. A meta-analysis of single-dose systemic dexamethasone examined its analgesic rather than antiemetic effect. State the dose threshold above which pain and opioid consumption were reduced, what happened at low doses, and whether preoperative or intraoperative administration produced the more consistent effect.

4. A multicentric cohort study of 30,561 oncologic resections examined intraoperative dexamethasone. Summarise its findings for 1-year mortality, recurrence-free survival, hyperglycaemia, and surgical-site infection, then state precisely why these findings cannot be used to recommend dexamethasone in order to improve cancer outcomes.

ANSWER KEY

1. Pooled across the 60 trials, 4-5 mg reduced 24-hour nausea and vomiting as effectively as 8-10 mg, supporting the lower SAMBA-recommended dose.

For antiemesis the bigger dose bought nothing: across 60 trials 4-5 mg matched 8-10 mg at 24 hours, which is why the lower SAMBA dose is recommended.

Dexamethasone to Prevent Postoperative Nausea and Vomiting: An Updated Meta-Analysis of Randomized Controlled Trials, Anesthesia and analgesia 2013 · PMID 23223115

2. Dexamethasone 8 mg was noninferior to placebo for surgical-site infection at 30 days, 8.1% versus 9.1%, and this included patients with diabetes. Nausea and vomiting fell from 53.9% to 42.2%. The infection comparison was a noninferiority comparison, not a demonstration that dexamethasone lowers infection.

PADDI is what to cite when someone withholds dexamethasone over infection risk: 8 mg was noninferior for 30-day surgical-site infection, diabetes included, while cutting nausea and vomiting from 53.9% to 42.2%.

Dexamethasone and Surgical-Site Infection, The New England journal of medicine 2021 · PMID 33951362

3. For analgesia the dose matters: doses above 0.1 mg/kg reduced pain and opioid consumption, low doses did not, and preoperative administration gave a more consistent effect than intraoperative.

Analgesia and antiemesis are two different dose questions for the same drug: the analgesic effect only showed up above 0.1 mg/kg, and it was more consistent when the dose went in preoperatively.

Perioperative Single Dose Systemic Dexamethasone for Postoperative Pain: A Meta-Analysis of Randomized Controlled Trials, Anesthesiology 2011 · PMID 21799397

4. Dexamethasone was associated with lower 1-year mortality and better recurrence-free survival, while doses above 0.09 mg/kg raised hyperglycaemia without raising surgical-site infection. These are associations from a cohort study, not randomised effects, so they cannot establish that dexamethasone improves cancer outcomes or justify giving it for that reason.

An association across 30,561 patients is a hypothesis worth testing, not a reason to give dexamethasone for oncologic benefit.

Association Between Intraoperative Dexamethasone and Postoperative Mortality in Patients Undergoing Oncologic Surgery: A Multicentric Cohort Study, Annals of surgery 2023 · PMID 35837889

For analgesia rather than antiemesis the dose matters

SOURCES

[1] Perioperative Single Dose Systemic Dexamethasone for Postoperative Pain: A Meta-Analysis of Randomized Controlled Trials, Anesthesiology 2011 · PMID 21799397

[2] Intraoperative High-Dose Dexamethasone for Cardiac Surgery: A Randomized Controlled Trial, JAMA 2012 · PMID 23117776

[3] Single Dose of Dexamethasone Is Not Associated With Postoperative Recurrence and Mortality in Breast Cancer Patients: A Propensity-Matched Cohort Study, BMC cancer 2019 · PMID 30894164

[4] Dexamethasone to Prevent Postoperative Nausea and Vomiting: An Updated Meta-Analysis of Randomized Controlled Trials, Anesthesia and analgesia 2013 · PMID 23223115

[5] Dexamethasone and Surgical-Site Infection, The New England journal of medicine 2021 · PMID 33951362

[6] Association Between Intraoperative Dexamethasone and Postoperative Mortality in Patients Undergoing Oncologic Surgery: A Multicentric Cohort Study, Annals of surgery 2023 · PMID 35837889