

Cricoid Pressure in Rapid Sequence Induction

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	2020	Heart & lung : the journal of crit	Across 12 randomised trials in 4,862 patients, cricoid pressure did not reduce
Cohort	2003	Anesthesiology	The oesophagus already lies lateral to the cricoid in more than half of necks
Cohort	2024	BMC anesthesiology	Rapid Sequence Induction (RSI) was used in 82% of patients undergoing tracheal
Review	2021	Anesthesia and analgesia	Current data are inadequate to mandate either continuing or abandoning cricoid pressure
Randomised trial	1992	British journal of anaesthesia	Applying cricoid pressure significantly decreases the success rate of initial
Review	2025	Anesthesiology	Modern evidence suggests cricoid force does not meaningfully impair successful

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

WHERE THE GUIDANCE SITS

Across 12 randomised trials in 4,862 patients, cricoid pressure did not reduce

Meta-analysis · Heart & lung : the journal of crit

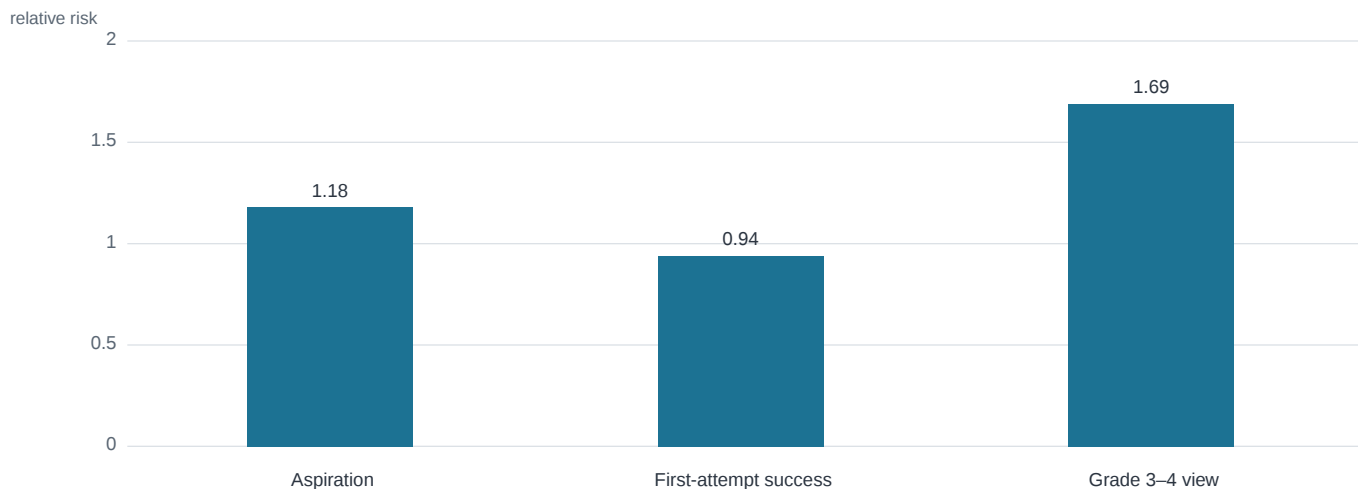
Across 12 randomised trials in 4,862 patients, cricoid pressure did not reduce aspiration, but it worsened first-attempt success, added nearly 7 seconds to intubation and worsened the laryngoscopic view.

Cricoid Pressure During Intubation: A Systematic Review and Meta-Analysis of Randomised Controlled Trials, Heart & lung : the journal of critical care 2020 · PMID 31685271

THE NUMBERS

Cricoid pressure did not reduce aspiration, and worsened the view

12 randomised trials, 4,862 patients.



No protection against aspiration; worse first-attempt success and a worse laryngoscopic view.

Cricoid Pressure During Intubation: A Systematic Review and Meta-Analysis of Randomised Controlled Trials, Heart & lung : the journal of critical care 2020 · PMID 31685271

WHAT THE TRIALS FOUND

Applying cricoid pressure significantly decreases the success rate of initial

Randomised trial · British journal of anaesthesia

Applying cricoid pressure significantly decreases the success rate of initial laryngeal mask airway insertion, requiring its removal for successful placement.

Cricoid Pressure May Prevent Insertion of the Laryngeal Mask Airway, British journal of anaesthesia 1992 · PMID 1467077

IN PRACTICE

What the cohorts and reviews add

4 findings, each on the slide that follows.

ANESTHESIOLOGY 2003

The oesophagus already lies lateral to the cricoid in more than half of necks

The oesophagus already lies lateral to the cricoid in more than half of necks

BMC ANESTHESIOLOGY 2024

Rapid Sequence Induction (RSI) was used in 82% of patients undergoing tracheal

Rapid Sequence Induction (RSI) was used in 82% of patients undergoing tracheal intubation in this cohort.

ANESTHESIA AND ANALGESIA 2021

Current data are inadequate to mandate either continuing or abandoning cricoid pressure

Current data are inadequate to mandate either continuing or abandoning cricoid pressure

ANESTHESIOLOGY 2025

Modern evidence suggests cricoid force does not meaningfully impair successful

Modern evidence suggests cricoid force does not meaningfully impair successful intubation when videolaryngoscopy is used

IN PRACTICE

The oesophagus already lies lateral to the cricoid in more than half of necks

Cohort · Anesthesiology

The oesophagus already lies lateral to the cricoid in more than half of necks, and applying cricoid pressure displaces it further sideways while also compressing the airway in 81%.

Cricoid Pressure Displaces the Esophagus: An Observational Study Using Magnetic Resonance Imaging, Anesthesiology 2003 · PMID 12826843

IN PRACTICE

Rapid Sequence Induction (RSI) was used in 82% of patients undergoing tracheal

Cohort · BMC anesthesiology

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Airway Management and Pulmonary Aspiration During Surgical Interventions in Pregnant Women in the 2nd/3rd Trimester and Immediate Postpartum - A Retrospective Study in a Tertiary Care University Hospital, BMC anesthesiology 2024 · PMID 38702641

IN PRACTICE

Current data are inadequate to mandate either continuing or abandoning cricoid pressure

Review · Anesthesia and analgesia

Current data are inadequate to mandate either continuing or abandoning cricoid pressure, and no universally accepted standard exists for the high-risk aspiration patient.

The Clinical Use of Cricoid Pressure: First, Do No Harm, Anesthesia and analgesia 2021 · PMID 31397697

IN PRACTICE

Modern evidence suggests cricoid force does not meaningfully impair successful

Review · Anesthesiology

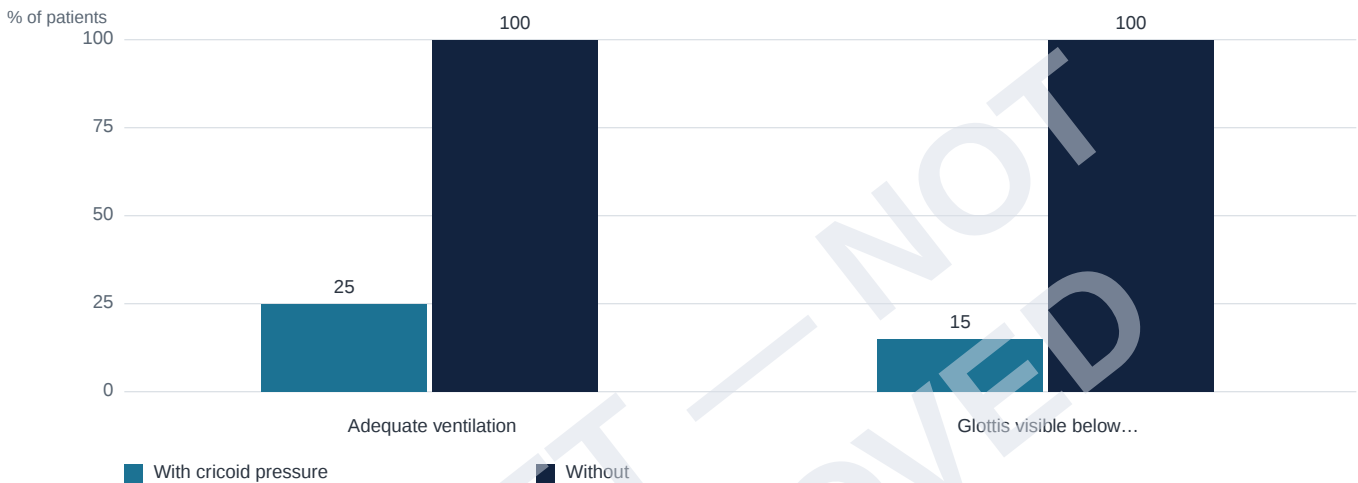
Modern evidence suggests cricoid force does not meaningfully impair successful intubation when videolaryngoscopy is used, and where it is applied it may be improved by ultrasound localisation and a trained assistant.

Cricoid Force: Anatomic, Physiologic, and Clinical Concepts, Anesthesiology 2025 · PMID 40923828

THE NUMBERS

It stops a laryngeal mask seating

Adequate ventilation through an LMA, 40 patients.

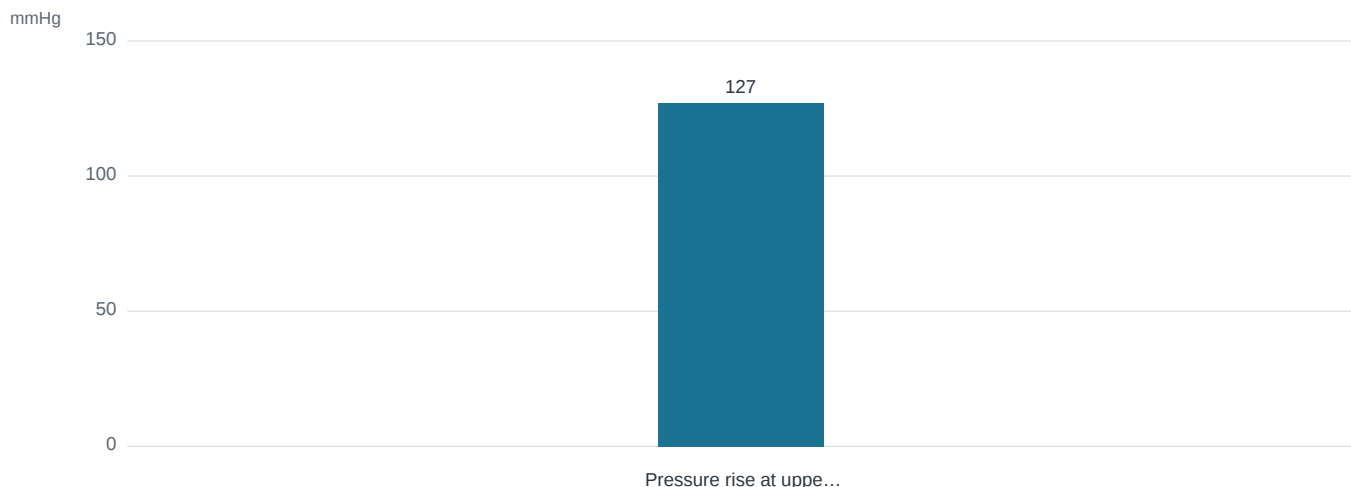


If you reach for a supraglottic airway as rescue, release the cricoid first.

THE NUMBERS

The pressure it generates is real, whatever the outcome data show

High-resolution manometry at the upper oesophageal sphincter, 30 N applied.



Far above the level thought necessary to prevent regurgitation — the mechanism is not the weak link.

INDICATIONS

When this is the right block

IRIS TRIAL, CRICOID PRESSURE VERSUS SHAM, JAMA SURG 2019

Rapid sequence induction in a patient at risk of aspiration

The IRIS trial randomised 3472 patients to cricoid pressure or a sham procedure. Pulmonary aspiration occurred in 10 patients (0.6%) with cricoid pressure and 9 (0.5%) with sham, but the upper limit of the one-sided 95% confidence interval for relative risk was 2.00, exceeding the prespecified 1.50, so noninferiority of omitting it was not demonstrated.

CRICOID PRESSURE AND FAILED INTUBATION RCT, ANESTHESIOLOGY 2005

Applied by someone trained to apply it

In 700 adults randomised to standardised cricoid pressure or sham during direct laryngoscopy, failed intubation at 30 seconds occurred in 4.4% versus 3.7% ($P = 0.70$), with comparable Cormack-Lehane grades and Intubation Difficulty Scale scores; median intubation time was 11.3 versus 10.4 seconds.

EFFECTIVENESS AND RISKS OF CRICOID PRESSURE IN THE ED, EMERG MED AUSTRALAS 2022

Outside theatre, the evidence thins out further

A systematic review of emergency department rapid sequence induction found only three eligible studies — one randomised trial of 54 patients and two registry studies of 3710 — and concluded there is insufficient evidence to say whether cricoid pressure affects first-pass success or the incidence of complications.

CONTRAINDICATIONS

When it is not

IRIS TRIAL, CRICOID PRESSURE VERSUS SHAM, JAMA SURG 2019

Continuing it when laryngoscopy is difficult

In IRIS, the Sellick group had more Cormack-Lehane grade 3 and 4 views (10% versus 5%) and more intubations taking longer than 30 seconds (47% versus 40%). If the view is poor, releasing the pressure is the intervention.

CRICOID PRESSURE AND FAILED INTUBATION RCT, ANESTHESIOLOGY 2005

Delegating it to someone who has not been trained in it

The randomised evidence that cricoid pressure does not increase failed intubation is explicitly conditioned on application by trained personnel using a standardised technique. Untrained application is a different intervention from the one that was studied.

CRICOID PRESSURE DISPLACES THE ESOPHAGUS, ANESTHESIOLOGY 2003

Believing it occludes the oesophagus

On magnetic resonance imaging of 22 volunteers, the oesophagus was already lateral to the cricoid in 52.6% of necks without cricoid pressure and in 90.5% with it, and cricoid pressure produced lateral laryngeal displacement in 66.7% and airway compression in 81.0% of necks.

Extending the trial result to pregnancy or outside the operating room

IRIS enrolled patients undergoing anaesthesia with rapid sequence induction in ten academic centres and its authors state that further studies are required in pregnant women and outside the operating room. Neither population was answered by this trial.

PEARLS

What experience adds

EFFECTIVENESS AND RISKS OF CRICOID PRESSURE IN THE ED, EMERG MED AUSTRALAS 2022

Aspiration happened in both arms of every study that looked

The emergency department systematic review found that aspiration occurred regardless of whether cricoid pressure was applied, and that first-pass success was not reduced by it — but the authors are explicit that three studies are not enough to draw firm conclusions either way.

THE CLINICAL USE OF CRICOID PRESSURE: FIRST, DO NO HARM, ANESTH ANALG 2021

The disagreement is between guidelines, not between doctors and evidence

Some rapid sequence induction guidelines recommend cricoid pressure and other international guidelines do not, and the available data are inadequate to impose a clinical guideline in either direction; practice differs between US and international practitioners for that reason.

Name the person and agree the release word

Before induction, say who is applying it, where their fingers go, and the exact word that means let go. A pair of hands on the neck that nobody has briefed is a pair of hands nobody can call off.

IN THE ROOM

What this changes about the next case

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

- 1**
Across 12 randomised trials in 4,862 patients, cricoid pressure did not reduce aspiration, but it worsened first-attempt success, added nearly 7 seconds to intubation and worsened the laryngoscopic view.
- 2**
Applying cricoid pressure significantly decreases the success rate of initial laryngeal mask airway insertion, requiring its removal for successful placement.
- 3**
The oesophagus already lies lateral to the cricoid in more than half of necks, and applying cricoid pressure displaces it further sideways while also compressing the airway in 81%.
- 4**
Rapid Sequence Induction (RSI) was used in 82% of patients undergoing tracheal intubation in this cohort.
- 5**
Current data are inadequate to mandate either continuing or abandoning cricoid pressure, and no universally accepted standard exists for the high-risk aspiration patient.

KEY TAKEAWAYS

What to carry into the next case

Across 12 randomised trials in 4,862 patients, cricoid pressure did not reduce

Heart & lung : the journal of critical care 2020

The oesophagus already lies lateral to the cricoid in more than half of necks

Anesthesiology 2003

Rapid Sequence Induction (RSI) was used in 82% of patients undergoing tracheal

BMC anesthesiology 2024

Current data are inadequate to mandate either continuing or abandoning cricoid pressure

Anesthesia and analgesia 2021

Across 12 randomised trials in 4,862 patients, cricoid pressure did not reduce

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 45-year-old with a small bowel obstruction needs an emergency laparotomy. The resident sets up for a rapid sequence induction and asks whether you want cricoid pressure, and who should apply it.

BOARD QUESTIONS

1. An MRI study examined the position of the oesophagus relative to the cricoid and the effect of applying cricoid pressure. Where does the oesophagus lie in most necks at baseline, what does cricoid pressure do to its position, and what happens to the airway?
2. Pooled randomised trials of cricoid pressure during intubation found no reduction in aspiration. Describe the intubation-related harms found in that same pooled analysis, so you can state what you are giving up when you apply it.
3. You have decided to use cricoid force during a rapid sequence induction performed with a videolaryngoscope. Based on modern evidence, what effect should you expect on your ability to intubate, and what two things can improve how the force is applied?
4. A resident asks you to give a definitive answer on whether cricoid pressure should be used in the patient at high risk of aspiration. Explain what the current state of the evidence permits you to say, and why you cannot give a categorical answer either way.

ANSWER KEY

1. The oesophagus already lies lateral to the cricoid in more than half of necks. Applying cricoid pressure displaces it further sideways, and it also compresses the airway in 81% of subjects.

The anatomy is not on the side of the manoeuvre — in most necks you are pushing a laterally placed oesophagus further aside while narrowing the airway.

Cricoid Pressure Displaces the Esophagus: An Observational Study Using Magnetic Resonance Imaging, Anesthesiology 2003 · PMID 12826843

2. Across 12 randomised trials in 4,862 patients, cricoid pressure did not reduce aspiration, and it worsened first-attempt success, added nearly 7 seconds to intubation and worsened the laryngoscopic view.

If the manoeuvre does not reduce aspiration but costs you the view, the first attempt and seven seconds, the trade is going the wrong way.

Cricoid Pressure During Intubation: A Systematic Review and Meta-Analysis of Randomised Controlled Trials, Heart & lung : the journal of critical care 2020 · PMID 31685271

3. Modern evidence suggests cricoid force does not meaningfully impair successful intubation when videolaryngoscopy is used. Where it is applied, it may be improved by ultrasound localisation and by a trained assistant.

If you are going to apply cricoid force, the videolaryngoscope blunts the cost, and who applies it and where matters more than whether you apply it.

Cricoid Force: Anatomic, Physiologic, and Clinical Concepts, Anesthesiology 2025 · PMID 40923828

4. Current data are inadequate to mandate either continuing or abandoning cricoid pressure, and no universally accepted standard exists for the high-risk aspiration patient. The evidence does not support a categorical instruction in either direction, so the honest answer is that this remains a matter of local practice and individual judgement rather than a settled standard.

Being able to say the evidence does not settle this is a better answer than confidently picking a side that the data cannot support.

The Clinical Use of Cricoid Pressure: First, Do No Harm, Anesthesia and analgesia 2021 · PMID 31397697

Across 12 randomised trials in 4,862 patients, cricoid pressure did not reduce

SOURCES

[1] Cricoid Pressure During Intubation: A Systematic Review and Meta-Analysis of Randomised Controlled Trials, Heart & lung : the journal of critical care 2020 · PMID 31685271

[2] Cricoid Pressure Displaces the Esophagus: An Observational Study Using Magnetic Resonance Imaging, Anesthesiology 2003 · PMID 12826843

[3] Airway Management and Pulmonary Aspiration During Surgical Interventions in Pregnant Women in the 2nd/3rd Trimester and Immediate Postpartum - A Retrospective Study in a Tertiary Care University Hospital, BMC anesthesiology 2024 · PMID 38702641

[4] The Clinical Use of Cricoid Pressure: First, Do No Harm, Anesthesia and analgesia 2021 · PMID 31397697

[5] Cricoid Pressure May Prevent Insertion of the Laryngeal Mask Airway, British journal of anaesthesia 1992 · PMID 1467077

[6] Cricoid Force: Anatomic, Physiologic, and Clinical Concepts, Anesthesiology 2025 · PMID 40923828

[7] IRIS trial, cricoid pressure versus sham, JAMA Surg 2019 · PMID 30347104

[8] Cricoid pressure and failed intubation RCT, Anesthesiology 2005 · PMID 15681945

[9] Effectiveness and risks of cricoid pressure in the ED, Emerg Med Australas 2022 · PMID 35577760