Supplementary Digital Content 4. Quality assessment

Supplementary Digital Content 4a. CEBM Level of Evidence assessment

Study & Year	Country	Study Design	Level of Evidence (CEBM)
Agrawal et al. 2015	India	Prospective registry with retrospective adjusted cohort analysis	2
Aiolfi et al. 2017	USA	Retrospective registry cohort	3
Alali et al. 2013	USA / Canada	Retrospective multicentre observational cohort	3
Alali et al. 2015	USA	Retrospective multicentre observational cohort	3
Al-Anazi et al. 2004	Saudi Arabia	Single-centre retrospective cohort	3
Alkhoury et al. 2014	USA	Retrospective multicentre registry cohort	3
Al Saiegh et al. 2020	USA	Retrospective statewide registry cohort	3
Biersteker et al. 2012	Netherlands	Prospective multicentre observational cohort	2
Chesnut et al. 2012	Bolivia & Ecuador	Multicentre randomised controlled trial	1
Dawes et al. 2015	USA	Prospective multicentre observational cohort with propensity score matching	2
Farahvar et al. 2012	USA	Prospective multicentre observational cohort	2
Foote et al. 2022	USA	Single-centre retrospective observational cohort	3
Fu et al. 2020	China	Retrospective multicentre cohort with propensity score matching	3
Gao et al. 2013	China	Retrospective cohort (operative subgroup)	3
Griesdale et al. 2010	Canada	Retrospective single-centre cohort with propensity-adjusted multivariable regression	3
Haddad et al. 2011	Saudi Arabia	Single-centre retrospective cohort	3
Jitchanvichai et al. 2024	Thailand	Single-centre retrospective cohort with propensity score matching	3
Kostić et al. 2011	Serbia	Prospective quasi-randomised comparative study	2
Lane et al. 2000	Canada	Retrospective observational cohort / trauma registry study	3
Lele et al. 2019	India	Prospective observational cohort with IPW / multivariable regression	2

Mauritz et al. 2008	Austria	Prospective multicentre cohort	2
Nattino et al. 2023	Italy & Hungary	Prospective multicentre observational cohort with full matching propensity analysis	2
Peled et al. 2025	Israel	Retrospective registry cohort	3
Robba et al. 2021	International	Prospective multicentre observational cohort with IPTW	2
Schupper et al. 2019	USA	Retrospective registry cohort with propensity methods	3
Shafi et al. 2008	USA	Retrospective multicentre registry cohort	3
Suehiro et al. 2017	Japan	Retrospective multicentre registry cohort	3
Talving et al. 2013	USA	Prospective observational cohort	2
Yang et al. 2022	China	Prospective multicentre observational cohort	2
You et al. 2016	China	Prospective single-centre observational cohort	2
Zeng et al. 2013	China	Prospective controlled observational study	2

NB: Levels of evidence were assigned using the Oxford Centre for Evidence-Based Medicine framework, with randomised controlled trials classified as Level 1, prospective comparative observational studies as Level 2, and retrospective comparative cohort or registry studies as Level 3.
Abbreviations: CEBM, Centre for Evidence-Based Medicine; IPW, inverse probability weighting; IPTW, inverse probability of treatment weighting.

Supplementary Digital Content 4b. STROBE reporting assessment of observational studies

Study & Year	Study Design	STROBE items absent (n/22)	STROBE items absent (%)	STROBE reporting quality	Key reporting limitations
Agrawal et al. 2015	Prospective registry with retrospective adjusted cohort analysis	2	9.1%	Good	Generalisability not clearly addressed; funding information not clearly reported
Aiolfi et al. 2017	Retrospective registry cohort	1	4.5%	Good	Funding information absent
Alali et al. 2013	Retrospective multicentre observational cohort	1	4.5%	Good	Funding information absent
Alali et al. 2015	Retrospective multicentre observational cohort with multilevel modelling + propensity-matched sensitivity analysis	2	9.1%	Good	Funding information not clearly reported; limited reporting of longer-term outcome availability
Al-Anazi et al. 2004	Single-centre retrospective cohort	4	18.2%	Limited	Data sources / measurement absent; bias handling absent; generalisability absent; funding information absent
Alkhoury et al. 2014	Retrospective multicentre registry cohort	0	0%	Good	Additional adjusted analyses limited
Al Saiegh et al. 2020	Retrospective statewide registry cohort	0	0%	Good	No major reporting deficiencies
Biersteker et al. 2012	Prospective multicentre observational cohort	0	0%	Good	No major reporting deficiencies
Dawes et al. 2015	Retrospective cohort with propensity score matching	0	0%	Good	No major reporting deficiencies
Farahvar et al. 2012	Prospective multicentre observational cohort	1	4.5%	Good	Bias domain not clearly addressed in detail
Foote et al. 2022	Single-centre retrospective observational cohort	1	4.5%	Fair	Other analyses incomplete; generalisability present but did not meet criteria
Fu et al. 2020	Retrospective multicentre cohort with propensity score matching	1	4.5%	Good	Funding information absent

Gao et al. 2013	Retrospective cohort (operative subgroup)	2	9.1%	Fair	Limited reporting of bias and generalisability; highly selected operative subgroup
Griesdale et al. 2010	Retrospective single-centre cohort with propensity-adjusted multivariable regression	1	4.5%	Good	Funding information absent
Haddad et al. 2011	Single-centre retrospective cohort	1	4.5%	Good	Funding information absent
Jitchanvichai et al. 2024	Single-centre retrospective cohort with propensity score matching	1	4.5%	Good	Data sources / measurement not fully reported
Kostić et al. 2011	Prospective quasi-randomised comparative study	2	9.1%	Fair	Bias reporting absent; quantitative variables reporting incomplete; generalisability present but did not meet criteria
Lane et al. 2000	Retrospective observational cohort / trauma registry study	1	4.5%	Good	Funding information absent
Lele et al. 2019	Prospective observational cohort with IPW / multivariable regression	2	9.1%	Good	Funding information not clearly reported; some data-source / measurement detail limited
Mauritz et al. 2008	Prospective multicentre cohort	2	9.1%	Fair	Data sources / measurement and bias handling incompletely reported
Nattino et al. 2023	Prospective multicentre observational cohort with full matching propensity analysis	0	0%	Good	No major reporting deficiencies
Robba et al. 2021	Prospective multicentre observational cohort with IPTW	1	4.5%	Good	Generalisability not clearly addressed
Schupper et al. 2019	Retrospective registry cohort with propensity methods	0	0%	Fair	Data sources / measurement present but did not meet criteria
Shafi et al. 2008	Retrospective multicentre registry cohort	1	4.5%	Good	Funding information absent
Talving et al. 2013	Prospective observational cohort	1	4.5%	Good	Funding information absent
You et al. 2016	Prospective single-centre observational cohort	1	4.5%	Good	Generalisability not clearly addressed
Zeng et al. 2013	Prospective controlled observational study	1	4.5%	Good	Generalisability not clearly addressed

Key: Good: 0–2 absent items, with no major reporting domain failure; Fair: 0–2 absent items with at least one important item present but not meeting criteria, or 3–5 absent items; Limited: major reporting deficiencies across key methodological or discussion domains

NB: This summary was derived from the completed item-by-item STROBE matrix and extended to the remaining included observational studies using the same decision logic. “STROBE items absent” refers to checklist items that were absent / not assessable. Good = most STROBE items present and meeting criteria, with only minor omissions; Fair = several omissions and/or at least one key item present but not meeting criteria; Limited = major reporting deficiencies across important methodological or discussion domains.

Abbreviations: IPW, inverse probability weighting; IPTW, inverse probability of treatment weighting; PSM, propensity score matching; STROBE, Strengthening the Reporting of Observational Studies in Epidemiology.

Supplementary Digital Content 4c. Risk of Bias 2.0 assessment of the included randomized controlled trial

Study & Year	Outcome	*D1. Randomisation process*	*D2. Deviations from intended interventions*	*D3. Missing outcome data*	*D4. Measurement of the outcome*	*D5. Selection of the reported result*	Overall RoB 2.0 judgement
Chesnut et al. 2012	Mortality	Low risk	Low risk	Low risk	Low risk	Low risk	**Low risk**
							
	GOS-E	Low risk	Low risk	Low risk	Low risk	Low risk	**Low risk**
							
	ICU Length of stay	Low risk	Low risk	Low risk	Low risk	Low risk	**Low risk**
							

Legend:  Low risk;  Some concerns;  High risk

NB: Risk of bias was assessed using the Cochrane Risk of Bias 2.0 tool for randomized trials. The included randomized controlled trial was assessed across the relevant outcome domains extracted in this review, including mortality, GOS-E, and ICU length of stay. Overall risk of bias was judged according to the RoB 2.0 domain-based algorithm.

Abbreviations: D1, bias arising from the randomization process; D2, bias due to deviations from intended interventions; D3, bias due to missing outcome data; D4, bias in measurement of the outcome; D5, bias in selection of the reported result; GOS-E, Glasgow Outcome Scale–Extended; ICU, intensive care unit; RoB, risk of bias.