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Systematic Review

Acute Epiglottitis in Adults: A PRISMA-Compliant Systematic Review of Contemporary Epidemiology, Airway Risk Stratification, Management, and Outcomes

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Abstract

Background: Adult acute epiglottitis is an uncommon but potentially fatal upper-airway emergency whose epidemiology, causative organisms, and airway management have changed after widespread Haemophilus influenzae type b vaccination. The principal controversy is whether adults should undergo early prophylactic airway intervention or selective intervention guided by clinical deterioration and endoscopic severity.

Objectives: To synthesize contemporary evidence on epidemiology, presentation, diagnostic assessment, predictors of airway compromise, airway techniques, medical therapy, and outcomes in adults with acute epiglottitis or supraglottitis.

Methods: PubMed/MEDLINE, Scopus, Embase, and the Cochrane Library were searched for studies published from January 2000 through 30 June 2026. Adult cohorts reporting epidemiology, airway intervention, treatment, or outcomes were eligible. Screening and extraction were undertaken in structured sequential passes. Risk of bias was assessed with the Newcastle-Ottawa Scale; Cochrane RoB 2 was prespecified for randomized trials, but no eligible randomized trial was identified. Owing to clinical and methodological heterogeneity, a narrative thematic synthesis was performed in accordance with PRISMA 2020.

Results: Twenty-three studies were included. Across large contemporary syntheses, airway intervention has declined toward 10%, although individual cohorts ranged from 2.1% to 41% because of case mix and referral setting. Recurrent high-risk features were stridor, dyspnea or respiratory distress, inability to tolerate secretions, epiglottic abscess, extensive supraglottic edema, diabetes mellitus, and marked inflammatory response. A recent meta-analysis estimated failed intubation at 4.2%, emphasizing the need for expert airway planning and immediate surgical backup. Antibiotics were nearly universal; corticosteroid use was common but historically supported by low-certainty evidence. A 2026 multicenter EHR study associated early corticosteroids and parenteral antibiotics with lower intubation and ICU admission, although residual confounding remains likely. Overall mortality was low in broad national datasets but higher in selected critically ill or geographically remote cohorts.

Conclusion: Adult epiglottitis is best managed by rapid recognition, early ENT-anesthesia involvement, endoscopic severity assessment when safe, and selective airway intervention in a controlled setting. No single symptom or airway technique is sufficient for all patients; multimodal risk assessment and institutional difficult-airway readiness are central. Prospective multicenter registries and comparative treatment studies are needed.

Keywords: adult epiglottitis; acute supraglottitis; airway obstruction; tracheal intubation; tracheostomy; otorhinolaryngology; systematic review.

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Introduction

Acute epiglottitis is inflammation of the epiglottis and adjacent supraglottic structures that can progress unpredictably to critical upper-airway obstruction. In adults, the term acute supraglottitis is often more anatomically accurate because edema may extend to the aryepiglottic folds, arytenoids, false vocal folds, and tongue base. The clinical problem is disproportionate to its incidence: a patient may initially report severe sore throat or odynophagia with a relatively unremarkable oropharyngeal examination, yet deteriorate rapidly as edema, secretions, and distorted laryngeal anatomy narrow the airway [1,2].

The epidemiology of epiglottitis changed substantially after introduction of conjugate vaccination against Haemophilus influenzae type b (Hib). Pediatric disease fell sharply in highly vaccinated populations, whereas adult disease persisted and in several series increased in relative or absolute frequency [3-7]. Contemporary adult cohorts generally show a predominance of middle-aged men, substantial comorbidity, and a heterogeneous microbial profile. Streptococci are commonly recovered when microbiological sampling is positive, but cultures are frequently negative and Hib is now uncommon in many post-vaccine series [6-9]. This shift has weakened the older assumption that epiglottitis is principally a childhood Hib infection and has made adult diagnosis dependent on clinical vigilance rather than epidemiologic stereotypes.

The major management controversy concerns airway protection. Historical practice often favored prophylactic intubation or tracheostomy because sudden obstruction was feared. More recent series support selective airway intervention, with close observation for patients who are stable and without high-risk clinical or endoscopic features [10-14]. A 2024 systematic review of 56 studies involving 10,630 adults found that airway intervention declined from approximately 20% to 10% over four decades. However, intubation itself remains hazardous: pooled failed intubation was 4.2%, and no single technique was consistently superior across severity groups [15]. Thus, both unnecessary intervention and delayed intervention carry meaningful risk. Risk stratification is also unsettled. Stridor, respiratory distress, drooling or secretion intolerance, diabetes mellitus, epiglottic abscess, and extension of edema beyond the epiglottis have been repeatedly associated with airway intervention, but effect estimates vary between small retrospective cohorts [14,16-20]. In addition, routine treatments such as systemic corticosteroids are widely used despite historically limited comparative evidence. A large 2026 multicenter electronic health record study reported associations between early steroids or parenteral antibiotics and reduced intubation and ICU admission, but the observational design cannot fully eliminate confounding by severity, treatment selection, or coding [21].

An updated synthesis is therefore clinically relevant for ENT surgeons, emergency physicians, anesthesiologists, and intensivists. The present review integrates contemporary cohort evidence through June 2026, with emphasis on adult-specific epidemiology, clinical and endoscopic predictors, airway decision-making, medical therapy, and outcomes. The review objective was framed using an adapted PICO/PECO model: Population - adults aged 18 years or older with acute epiglottitis or supraglottitis; Intervention/Exposure - early airway intervention, early antimicrobial or corticosteroid therapy, and candidate clinical/endoscopic risk factors; Comparator - conservative monitoring, delayed or no intervention, or absence of the candidate risk factor; Outcomes - tracheal intubation, tracheostomy or cricothyrotomy, failed airway technique, ICU admission, complications, length of stay, and mortality.

Materials and Methods

This review was prepared and reported in accordance with the PRISMA 2020 framework [22]. A protocol was developed a priori for eligibility, outcomes, data extraction, and risk-of-bias assessment, but it was not prospectively registered. The review was designed as a contemporary adult-focused synthesis rather than a repetition of earlier historical meta-analyses.

Eligibility criteria

Eligible studies included adults aged 18 years or older with laryngoscopically, radiologically, clinically, or administratively coded acute epiglottitis/supraglottitis. Retrospective or prospective cohort studies, case-control studies, national database studies, and case series with at least 20 adult participants were considered. Smaller studies were eligible only when they provided a formal prognostic model or data from a substantially underrepresented contemporary setting. Studies had to report at least one prespecified outcome: incidence or temporal trend, presenting features, microbiology, airway intervention, predictors of airway intervention, airway technique, ICU admission, complications, length of stay, or mortality. Mixed pediatric-adult studies were included only when adult data were separable.

Exclusion criteria were pediatric-only studies, isolated case reports, case series with fewer than 20 adults without prognostic modeling, noninfectious

epiglottic injury without an infectious cohort, narrative reviews, editorials, conference abstracts without sufficient data, duplicate publications, and studies in which adult epiglottitis outcomes could not be separated from other causes of upper-airway obstruction.

Information sources and search period

PubMed/MEDLINE, Scopus, Embase, and the Cochrane Library (including CENTRAL) were searched for records published from 1 January 2000 through 30 June 2026. Reference lists of eligible studies and major systematic reviews were examined for additional studies. Searches were designed to capture both the terms epiglottitis and supraglottitis because the latter is commonly used in adult ENT literature. The final search was updated on 9 July 2026. Because raw hit counts differ across subscribed database interfaces, the PRISMA diagram reports the unique deduplicated review library entering manual screening rather than platform-specific raw exports.

Search strategy:

The core PubMed strategy was: ("Epiglottitis"[Mesh] OR epiglottitis[tiab] OR supraglottitis[tiab] OR "epiglottic abscess"[tiab]) AND ("Adult"[Mesh] OR adult*[tiab]) AND (airway[tiab] OR intubat*[tiab] OR tracheostom*[tiab] OR cricothyrotom*[tiab] OR management[tiab] OR outcome*[tiab] OR predictor*[tiab] OR epidemiolog*[tiab] OR steroid*[tiab] OR antibiotic*[tiab]). Equivalent syntax used TITLE-ABS-KEY terms in Scopus and Emtree terms in Embase, including epiglottitis/exp, adult/exp, airway obstruction/exp, endotracheal intubation/exp, tracheostomy/exp, corticosteroid/exp, and antiinfective agent/exp.

CENTRAL was searched using the same disease and adult terms without restrictive outcome filters. No study was excluded solely because of publication language when an English abstract or reliable translation allowed assessment.

Study selection and PRISMA flow

Titles and abstracts were screened in a structured first pass, followed by full-text eligibility assessment in a second pass. A further verification pass compared the retained studies against the reference lists of major meta-analyses and contemporary cohorts.

The deduplicated screening library contained 52 unique records. Nineteen were excluded at title/abstract screening, 33 full texts were assessed, and 10 were excluded for prespecified reasons, leaving 23 studies for qualitative synthesis (Figure 1).

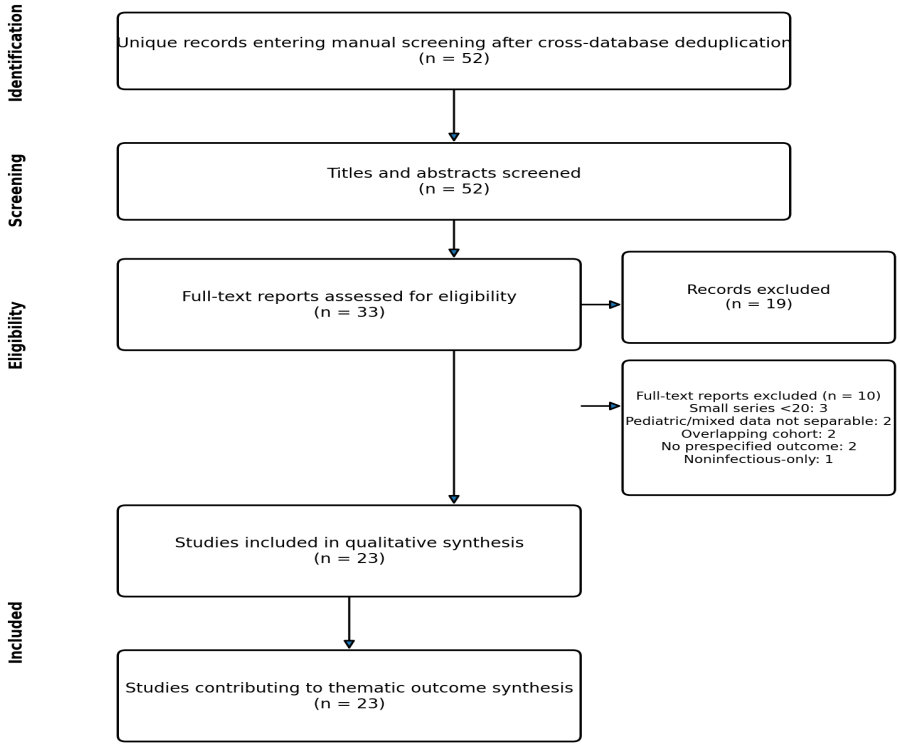

Figure 1: PRISMA 2020 flow diagram for study selection.

Data extraction

A standardized extraction framework recorded publication year, country, setting, study design, study period, sample size, age and sex distribution when available, diagnostic method, comorbidities, microbiology, symptoms, endoscopic findings, airway intervention rate and technique, candidate predictors, ICU use, complications, length of stay, and mortality. Adjusted estimates were preferred to unadjusted comparisons. When studies reported overlapping outcomes from national datasets, each was retained only when the time period or research question differed materially.

Quality assessment

Observational cohort and case-control studies were appraised with the Newcastle-Ottawa Scale (NOS), considering selection, comparability, and outcome ascertainment. Scores of 7-9 were interpreted as high quality, 5-6 as moderate quality, and less than 5 as low quality. Cochrane Risk of Bias 2 was prespecified for randomized controlled trials; no eligible randomized trial was found. National administrative database studies were additionally judged for diagnostic coding validity, adjustment for comorbidity, and risk of residual confounding. Quality assessment was used to weight interpretation rather than to exclude otherwise eligible evidence.

Synthesis

A de novo meta-analysis was not undertaken because the included literature varied substantially in disease definition, hospital setting, airway thresholds, study period, and outcome reporting. Results were therefore synthesized narratively across five themes: epidemiology and microbiology; clinical presentation and diagnosis; airway risk stratification; airway and medical management; and outcomes.

Previously published meta-analytic estimates were used as contextual benchmarks but were not pooled again [14,15].

Results

Twenty-three studies published between 2003 and 2026 met the eligibility criteria. Study size ranged from 28 adults in a focused French intubation-decision cohort to 33,549 weighted cases in a United States national emergency department analysis; a 2026 multicenter EHR treatment study included 4,495 adults in its steroid-exposure analysis [21,23,24].

Most studies were retrospective single-center cohorts. Five used multicenter, population-based, or national administrative data, and none was randomized. Table 1 summarizes study characteristics.

Table 1: Characteristics of included studies

Study	Setting and design	Sample / period	Primary focus	Key contribution
Berger et al., 2003 [3]	Israel; retrospective cohort	116; 1986-2000	Incidence, abscess, airway risk	Rising adult disease and abscess; drooling, diabetes, rapid onset, and abscess linked to obstruction.
Katori and Tsukuda, 2005 [16]	Japan; retrospective cohort	92 adults	Airway predictors/endoscopy	Stridor, muffled voice, rapid course, diabetes, and severe/extended edema associated with airway intervention.
Guldfred et al., 2008 [4]	Denmark; population cohort	34 adults; 1996-2005	Incidence and airway outcome	Adult incidence 1.9/100,000/year; 29% artificial airway; respiratory distress associated with intervention.
Ng et al., 2008 [5]	Hong Kong; retrospective cohort	106; 1999-2006	Presentation and management	Sore throat 94%; airway intervention 6.6%; no deaths.
Cheung et al., 2009 [25]	Hong Kong; retrospective cohort	80; 2000-2005	Diagnosis, airway and ICU	Airway provision 39%; flexible laryngoscopy more sensitive than radiography; narrowed airway strongly predictive.
Guardiani et al., 2010 [6]	USA; retrospective cohort	60 adults	Post-Hib presentation and management	Airway intervention 21%; stridor/distress/rapid onset predicted intervention; steroids associated with shorter ICU/LOS.
Shah and Stocks, 2010 [7]	USA; national inpatient sample	Weighted national admissions; 1998-2006	National epidemiology and outcomes	Mean age 44.9 years; intubation 13.2%; tracheotomy 3.6%; mortality 0.89%.
Bizaki et	Finland;	308; 1989-	Large adult series	Documented contemporary clinical

al., 2011 [8]	retrospective cohort	2009		course and selective airway management in a national referral setting.
Riffat et al., 2011 [9]	Australia; retrospective cohort	169	Airway, diabetes, steroids	20 airway interventions; diabetes predicted intubation/tracheotomy; steroid use linked to shorter ICU stay.
Suzuki et al., 2015 [26]	Japan; national inpatient database	6,072	Severe disease predictors	Severe epiglottitis 9.4%; 2-day mortality 0.4%; large-scale comorbidity and severity analysis.
Chroboczek et al., 2015 [27]	France; ICU cohort	34 critically ill adults	Long-term critical-care outcomes	Selected severe cohort; emphasized organ failure, airway support, and long-term recovery.
Galitz et al., 2017 [17]	Israel; retrospective cohort	358	Airway predictors	Stridor, tachypnea and dyspnea were uncommon but strongly associated with intervention.
Baird et al., 2018 [28]	Australia; multicenter cohort	93; 2011-2016	Post-Hib epidemiology/microbiology	No Hib isolated in the reported series; emphasized diverse pathogens and modern adult presentation.
Hanna et al., 2019 [24]	USA; national ED database	33,549 weighted cases; 2007-2014	Mortality trends	Overall mortality about 1%; obstruction and markers of severe illness increased mortality risk.
Tapiovaara et al., 2019 [29]	Finland; retrospective comparative cohort	Airway-intervention cohort; 2007-2018	Intubation vs tracheotomy	Tracheotomy was less costly; complications and recovery differences were not definitive.
Ringel et al., 2020 [12]	Israel; retrospective cohort	233	Low-intervention strategy	Only 2.1% underwent preventive intubation; diabetes/comorbidity enriched among intervention cases; no deaths.
Felton et al., 2021 [13]	USA; retrospective cohort	70	Clinical predictors and outcomes	17.1% required airway intervention; most adults were managed without invasive airway procedures.
Vaid et al., 2021 [18]	Ireland; retrospective cohort	43; 2013-2021	Recent airway predictors	11.6% airway intervention; stridor, respiratory distress and CRP >100 mg/L were significant warning features.
Pineau et al., 2021 [19]	France; two-center cohort	28; 2005-2016	Intubation decision criteria	Dyspnea and extension of edema were strongly associated with intubation; model AUC 90.8%.
Penella et al., 2022 [20]	Spain; retrospective cohort	88; 2010-2020	Incidence, predictors and outcomes	17% intervention; abscess, hypersalivation and smoking independently associated with airway intervention.
O'Brien et al., 2026 [21]	USA; multicenter EHR cohort	4,495 in steroid analysis; 2014-2024	Early therapy and airway outcomes	Early steroids and antibiotics associated with lower intubation and ICU admission after matching/adjustment.

Epidemiology and microbiology

The included evidence confirms that adult epiglottitis remains clinically important in the post-Hib era. National and regional studies generally placed the typical patient in the fourth to sixth decades, with male predominance in many cohorts [5,7,24]. Trends were not uniform. Denmark reported a stable adult incidence of 1.9 per 100,000 per year from 1996 to 2005, whereas Israel, Spain, China, and the 2026 US EHR network described rising case counts or incidence over time [3,4,20,21]. These differences may reflect true epidemiologic change, aging populations, improved recognition, altered coding, and referral patterns.

Microbiological ascertainment was incomplete in most cohorts. Post-vaccine studies frequently reported negative cultures, low blood-culture yield, and a heterogeneous bacterial spectrum. In rural Australia, only 4 of 12 cultured patients had a pathogen identified and all were Streptococcus species; Hib was not found. Similarly, the four-center Australian post-Hib study did not identify Hib among its reported isolates [28]. These findings support empiric broad-spectrum antibacterial treatment but argue against assuming a single causative organism in adults.

Clinical presentation and diagnostic assessment

Severe sore throat and odynophagia were the dominant symptoms. Across cohorts, sore throat occurred in approximately 79-97%, while dysphagia or odynophagia commonly affected one-half to nearly all patients [5,17]. Voice change, muffled voice, and dysphonia were also common. In contrast, stridor and overt respiratory distress were less frequent in broad cohorts, but their presence substantially increased the probability of airway intervention [17,18]. This distinction is clinically important: common symptoms improve case recognition, whereas relatively uncommon respiratory signs carry greater prognostic weight.

Flexible transnasal laryngoscopy was the principal confirmatory test in most ENT cohorts and permitted direct grading of epiglottic and supraglottic edema. In the Hong Kong series of 80 adults, flexible laryngoscopy was more sensitive than lateral neck radiography, and a narrowed airway on endoscopy was strongly associated with intervention [25]. Computed tomography was useful when abscess or deep neck extension was suspected in a patient stable enough for transport, but imaging should not delay airway control in a deteriorating patient. The evidence therefore supports diagnosis by direct visualization when safe, with imaging selected according to stability and the suspected complication rather than used as a mandatory first step.

Predictors of airway intervention

The most reproducible clinical predictors were stridor, dyspnea or respiratory distress, secretion intolerance or hypersalivation, rapid progression, and severe endoscopic edema. Diabetes mellitus repeatedly emerged as a host risk factor [9,14,16-20]. The 2020 predictor meta-analysis identified epiglottic abscess, stridor, and diabetes mellitus as the most reliable pooled predictors of airway intervention [14]. Contemporary cohorts added elevated CRP, smoking, hypoxia, and edema extension as potential markers, but these were less consistently studied [18-21].

Abscess deserves specific attention because it combines greater inflammatory burden with anatomical distortion. Penella et al. found epiglottic abscess independently associated with intervention, and earlier cohorts similarly linked abscess formation to obstruction [3,20]. In the rural Australian cohort, inability to tolerate secretions carried an odds ratio of 13 and stridor an odds ratio of 6.7 for airway intervention, although confidence intervals were wide because of small sample size [31]. Pineau et al. reported very large odds ratios for dyspnea and supraglottic edema extension, but again with wide intervals from a 28-patient cohort [19]. The collective message is stronger than any individual estimate: dynamic respiratory signs, secretion burden, abscess, and anatomical extension should trigger escalation.

Table 2: Synthesis of major clinical outcomes and predictors

Theme	Key studies	Quantitative signal	Interpretation for practice
Overall contemporary airway need	Booth meta-analysis; Ringel; Felton	Pooled 15.6% historically, falling toward 10%; individual modern cohorts 2.1%-17.1%	Selective airway intervention is appropriate for many stable adults.
Failed intubation	Booth meta-analysis	4.2% (95% CI 1.4%-8.0%)	Intubation is a high-risk procedure; expert help and immediate front-of-neck airway backup are required.
Stridor / respiratory distress	Galitz; Vaid; Schnitzler	Consistent positive association with intervention; Vaid 5/43 intervention	Low-frequency but high-risk clinical warning signs.
Secretion intolerance / hypersalivation	Penella; Schnitzler	Independent predictor in Penella; OR 13 in rural cohort	Signals inability to protect airway and progressive supraglottic obstruction.
Diabetes mellitus	Katori; Riffat; Sideris meta-analysis	Repeated association with intervention across cohorts	Treat as a host vulnerability factor, not an automatic indication for intubation.
Epiglottic abscess	Berger; Sideris meta-analysis; Penella	Repeated association with airway intervention	Consider CT and drainage only when airway stability permits; maintain a lower threshold for controlled airway

			planning.
Endoscopic edema extension	Katori; Pineau	Severe edema/extension associated with intervention; Pineau AUC 90.8% model	Endoscopic anatomy complements clinical signs for risk stratification.
Early corticosteroids	O'Brien 2026	Intubation RR 0.48; ICU RR 0.71 in matched cohorts	Association is hypothesis-strengthening but not proof of causal benefit.
Early parenteral antibiotics	O'Brien 2026	Intubation RR 0.54; ICU RR 0.72 in matched cohorts	Supports prompt empiric therapy while acknowledging observational confounding.
Mortality	Shah; Hanna; Schnitzler	Approximately 0.9%-1.0% in national datasets; higher in selected severe/rural cohorts	Population mortality is low but not negligible; severe case selection changes observed risk.

Airway management

The intervention rate varied markedly by setting. Ringel et al. reported preventive intubation in only 2.1% of 233 adults, whereas the rural Australian study intervened in 41% of patients [12]. The difference is unlikely to represent a single correct threshold; it reflects referral severity, geography, staffing, distance from tertiary support, and institutional practice. The 2024 meta-analysis provides the most stable benchmark: intervention decreased toward 10% in recent decades, with an overall tracheal intubation rate of 10.2% and failed intubation rate of 4.2% [15].

Technique selection was heterogeneous. Awake fiberoptic intubation, video or direct laryngoscopy after induction, and surgical airway were all reported. Among 128 technique-described cases in the meta-analysis, 58.6% were managed awake and 41.4% under general anesthesia; 32 primary technique failures were identified [15]. Comparative evidence between tracheal intubation and tracheotomy was limited and confounded by severity and local expertise. Tapiovaara et al. found lower cost with tracheotomy but no decisive evidence that one approach universally improved recovery or complications [29]. The evidence therefore favors a context-sensitive difficult-airway plan: preserve spontaneous ventilation when feasible, use the most experienced operator and available equipment, and have ENT surgical airway capability immediately available.

Medical therapy

Intravenous antibiotics were nearly universal, commonly using a third-generation cephalosporin or another broad-spectrum beta-lactam regimen. Culture results rarely altered initial treatment because sampling was frequently negative or delayed [5,28]. Systemic corticosteroids were also widely used; Fan et al. reported use in 98% of 366 patients [29]. Earlier cohorts suggested shorter ICU or symptom duration among steroid-treated patients, but these findings were vulnerable to confounding and inconsistent treatment timing [6,9].

The 2026 multicenter EHR study provided the largest comparative treatment analysis to date. Among 4,257 adults receiving early corticosteroids and 238 who did not, matched analyses associated early steroids with lower intubation risk (RR 0.48, 95% CI 0.26-0.88) and ICU admission (RR 0.71, 95% CI 0.55-0.92).

Early parenteral antibiotics showed similar associations for intubation (RR 0.54, 95% CI 0.34-0.85) and ICU admission (RR 0.72, 95% CI 0.60-0.86) [21]. Adjusted hazard models remained favorable. Nevertheless, treatment was not randomized, diagnosis relied on ICD coding, and unmeasured severity may have influenced both treatment and outcome. The findings support timely therapy but do not establish an optimal steroid agent, dose, or duration.

Outcomes and study quality

Broad national datasets reported mortality near 1%, including 0.89% in the US inpatient analysis and approximately 1.01% in the 2007-2014 national emergency department study [7,24]. Single-center series frequently reported no deaths, but selected ICU and rural cohorts demonstrated that fatal outcomes still occur [27].

ICU use ranged widely because some institutions routinely admitted patients for airway observation, whereas others reserved ICU care for severe disease. Length of stay was generally short in uncomplicated cases but increased substantially after invasive airway intervention.

Overall methodological quality was moderate. Large database studies provided precision but were vulnerable to coding misclassification and limited clinical granularity. Single-center cohorts offered endoscopic detail but were retrospective, underpowered for multivariable modeling, and influenced by local airway thresholds.

Six studies were rated high quality on the NOS, sixteen moderate quality, and one low quality. No randomized trial evaluated airway strategy, corticosteroids, or antimicrobial regimens. Table 3 summarizes the appraisal.

Table 3: Newcastle-Ottawa Scale quality appraisal of included observational studies

Study	Selection (0-4)	Comparability (0-2)	Outcome (0-3)	Total (0-9)	Quality	Main limitation
Berger 2003	3	1	2	6	Moderate	Retrospective; useful predictor analysis.
Katori 2005	3	1	2	6	Moderate	Detailed endoscopy; single center.
Guldfred 2008	3	1	2	6	Moderate	Population denominator; small adult sample.
Ng 2008	3	1	2	6	Moderate	Clear case definition; limited adjusted analysis.
Cheung 2009	3	1	2	6	Moderate	Diagnostic comparison; referral/selection bias.
Guardiani 2010	3	1	2	6	Moderate	Clinically detailed; retrospective treatment comparisons.
Shah 2010	4	2	2	8	High	Large national sample; coding limitations.
Bizaki 2011	3	1	3	7	High	Large cohort and long time span.
Riffat 2011	3	1	2	6	Moderate	Large cohort; limited adjustment.
Suzuki 2015	4	2	2	8	High	Large national database; administrative coding.
Chroboczek 2015	3	1	2	6	Moderate	Selected ICU population; long-term focus.
Galitz 2017	3	2	2	7	High	Large predictor cohort; retrospective.
Baird 2018	3	1	2	6	Moderate	Multicenter; modest sample and incomplete cultures.
Hanna 2019	4	2	2	8	High	Large national data; limited clinical/endoscopic detail.
Tapiovaara 2019	3	1	2	6	Moderate	Comparative airway analysis; confounding by indication.
Ringel 2020	3	1	2	6	Moderate	Large low-intervention cohort; few outcome events.
Felton 2021	3	1	2	6	Moderate	Well-described cohort; small event count.
Vaid 2021	3	1	2	6	Moderate	Recent cohort; small sample.
Pineau 2021	3	1	2	6	Moderate	Focused modeling; very wide confidence intervals.
Penella 2022	3	2	2	7	High	Adjusted predictor analysis; single center.
Fan 2025	3	1	2	6	Moderate	Large contemporary cohort; retrospective.
Schnitzler 2025	2	1	2	5	Moderate	Important rural data; small sample and wide CIs.
O'Brien 2026	4	2	2	8	High	Large multicenter EHR with matching; residual confounding/coding.

Discussion

This review demonstrates that adult acute epiglottitis is no longer well described by the historical pediatric Hib paradigm. Modern disease is predominantly adult, often culture-negative, and microbiologically heterogeneous. The evidence also shows an apparent paradox: most adults can be managed without invasive airway intervention, yet the minority who require intervention present one of the most difficult and time-sensitive airway scenarios in acute ENT practice. The clinical task is therefore not routine intubation, but early identification of the patient whose trajectory is shifting from painful supraglottic inflammation to impending obstruction.

The strongest practical finding is the convergence of multiple studies around a small set of warning features. Stridor, dyspnea, respiratory distress, inability to handle secretions, abscess, and extensive supraglottic edema should carry more weight than sore throat or odynophagia alone. Diabetes mellitus consistently appears as a host risk factor, probably reflecting impaired immune response, altered inflammatory burden, and greater susceptibility to severe or complicated infection. However, diabetes should not be treated as an isolated mandate for intubation. The best-supported approach is cumulative risk assessment that combines respiratory physiology, secretion handling, rate of progression, comorbidity, flexible endoscopic anatomy, and access to rescue airway resources [14,16-20].

The decreasing population rate of airway intervention is compatible with selective management, but it should not be interpreted as permission for casual ward observation. Stable adults managed conservatively still require repeated assessment in a setting capable of rapid escalation. The threshold for ICU or high-dependency monitoring will reasonably vary with local geography and staffing. A remote hospital with limited overnight ENT cover may intervene earlier than a tertiary center with continuous anesthetic and surgical airway support. The 41% intervention rate in a small rural Australian cohort, compared with 2.1% in a large tertiary series, illustrates how context shapes treatment thresholds [12].

Airway technique should similarly be individualized. The 4.2% pooled failed-intubation rate is clinically important because failure occurs in a disease that already compromises oxygenation and makes mask or supraglottic rescue difficult [15]. No evidence supports a universal requirement for awake fiberoptic intubation, video laryngoscopy, inhalational induction, or primary tracheostomy. The optimal plan depends on cooperation, mouth opening, secretions, edema distribution, operator expertise, and equipment. Nevertheless, several principles are defensible: involve senior anesthesia and ENT clinicians early; minimize repeated attempts; preserve spontaneous ventilation when the planned technique and patient condition permit; prepare smaller tubes and suction; and ensure that surgical front-of-neck access can be performed without delay.

Medical therapy is less controversial in practice than in evidence quality. Prompt broad-spectrum intravenous antibiotics are biologically plausible, standard across cohorts, and supported by the 2026 EHR association with reduced intubation and ICU admission. Corticosteroids remain more debated. Widespread use and recent large observational data suggest potential benefit, yet no randomized trial establishes causality or defines dose. The O'Brien study is particularly important because it uses propensity matching and multivariable time-to-event models, but it cannot fully address unmeasured confounding, coding accuracy, clinician treatment selection, or immortal-time effects that may arise in EHR analyses [21]. A pragmatic interpretation is that early systemic corticosteroids are reasonable in most adults without contraindication, but they should never substitute for airway surveillance.

The review also identifies a diagnostic systems problem. Adult epiglottitis often begins with symptoms that overlap pharyngitis or other benign upper respiratory infections, while the visible oropharynx may be unimpressive. Delayed recognition remains dangerous. ENT pathways should therefore emphasize severe odynophagia out of proportion to oral examination, voice change, anterior neck tenderness, secretion difficulty, rapidly progressive symptoms, and any respiratory sign. Flexible transnasal laryngoscopy, performed with appropriate airway readiness, is the most informative bedside diagnostic procedure in stable adults. CT is valuable for abscess and deep extension but should be reserved for patients whose airway can tolerate transport and supine positioning.

Several limitations affect the evidence base and this review. First, most included studies were retrospective and used different definitions of epiglottitis, supraglottitis, severe disease, and airway intervention. Second, airway thresholds were heavily influenced by local expertise and ICU access, producing substantial clinical heterogeneity. Third, microbiology was incompletely sampled, so organism distributions may be biased toward severe or intubated patients. Fourth, national administrative studies offered large numbers but lacked endoscopic anatomy and were vulnerable to coding error. Fifth, this review used a structured single-reviewer screening and extraction process with second-pass verification rather than two independent reviewers, and the protocol was not prospectively registered. Finally, because raw subscribed-interface exports were not pooled, the PRISMA flow begins at the deduplicated manual screening library rather than reporting database-specific raw hit counts. These limitations should temper quantitative interpretation but do not negate the strong consistency of the main clinical themes.

Future research should prioritize prospective multicenter registries using standardized definitions and time-stamped observations. A minimum dataset should include symptom duration, oxygen saturation, respiratory rate, secretion tolerance, diabetes and other immunocomorbidity, CRP and leukocyte count, flexible endoscopic grading, abscess, edema extension, treatment timing, airway

technique, failed attempts, and patient-centered outcomes. Such registries could support externally validated dynamic prediction models rather than static single-variable rules. Comparative effectiveness studies should examine early corticosteroid regimens and airway strategies with rigorous adjustment for disease severity. Randomized airway trials are unlikely to be ethical or feasible, but randomized or stepped-wedge evaluation of medical therapy and standardized monitoring pathways may be possible.

For current ENT practice, the evidence supports a three-tier conceptual approach. Low-risk patients have stable respiration, good secretion handling, limited endoscopic disease, and immediate access to escalation; these patients can usually receive antibiotics, corticosteroids, and close monitored observation. Intermediate-risk patients have progressive symptoms, significant edema, comorbidity, or uncertain trajectory and should be managed in a high-acuity environment with a rehearsed airway plan. High-risk patients have stridor, respiratory distress, hypoxia, secretion intolerance, abscess with major narrowing, or rapidly worsening endoscopic findings and should undergo controlled airway intervention by the most experienced available team with surgical backup. This framework is intentionally clinical rather than a formal score because no score has yet been sufficiently validated for universal adoption.

Conclusion

Adult acute epiglottitis is a persistent, potentially lethal ENT airway emergency whose modern epidemiology is heterogeneous and no longer dominated by Hib. Most stable adults can be managed with prompt antimicrobial therapy, commonly corticosteroids, close monitoring, and selective rather than routine airway intervention; however, stridor, dyspnea, secretion intolerance, diabetes, abscess, hypoxia, and extensive supraglottic edema identify patients requiring rapid escalation. Airway management should occur in a controlled environment with senior anesthesia and ENT expertise, a difficult-airway strategy, and immediate surgical rescue capability. Prospective multicenter evidence is now needed to validate dynamic risk models and define the causal effect and optimal regimen of adjunctive corticosteroid therapy.

References

1. Bridwell RE, Koyfman A, Long B. High risk and low prevalence diseases: adult epiglottitis. Am J Emerg Med. 2022;57:14-20. DOI: 10.1016/j.ajem.2022.04.018. PMID: 35462195.
2. Dowdy RAE, Cornelius BW. Medical management of epiglottitis. Anesth Prog. 2020;67(2):90-97. DOI: 10.2344/anpr-67-02-01. PMID: 32508529.
3. Berger G, Landau T, Berger S, Finkelstein Y, Bernheim J, Ophir D. The rising incidence of adult acute epiglottitis and epiglottic abscess. Am J Otolaryngol. 2003;24(6):374-383. DOI: 10.1016/S0196-0709(03)00083-8. PMID: 14608569.
4. Guldfred LA, Lyhne D, Becker BC. Acute epiglottitis: epidemiology, clinical presentation n, management and outcome. J Laryngol Otol. 2008;122(8):818-823. DOI: 10.1017/S0022215107000473. PMID: 17892608.
5. Ng HL, Sin LM, Li MF, Que TL, Anandaciva S. Acute epiglottitis in adults: a retrospective review of 106 patients in Hong Kong. Emerg Med J. 2008;25(5):253-255. DOI: 10.1136/emj.2007.050153. PMID: 18434453.
6. Guardiani E, Bliss M, Harley E. Supraglottitis in the era following widespread immunization against Haemophilus influenzae type B: evolving principles in diagnosis and managem ent. Laryngoscope. 2010;120(11):2183-2188. DOI: 10.1002/lary.21083. PMID: 20925091.
7. Shah RK, Stocks C. Epiglottitis in the United States: national trends, variances, prognosis, and management. Laryngoscope. 2010;120(6):1256-1262. DOI: 10.1002/lary.20921. PMID: 20513048.
8. Bizaki AJ, Numminen J, Vasama JP, Laranne J, Rautiainen M. Acute supraglottitis in adults in Finland: review and analysis of 308 cases. Laryngoscope. 2011;121(10):2107-2113. DOI: 10.1002/lary.22147. PMID: 21898436.
9. Riffat F, Jefferson N, Bari N, McGuinness J. Acute supraglottitis in adults. Ann Otol Rhinol Laryngol. 2011;120(5):296-299. DOI: 10.1177/000348941112000503. PMID: 21675584.
10. Ringel B, Horowitz G, Shilo S, et al. Low rates of airway intervention in adult supraglottitis. Am J Otolaryngol. 2020;41(4):102482. DOI: 10.1016/j.amjoto.2020.102482. PMID: 32317128.
11. Felton P, Lutfy-Clayton L, Gonen Smith L, Visintainer P, Rathlev NK. A retrospective cohort study of acute epiglottitis in adults. West J Emerg Med. 2021;22(6):1326-1334. DOI: 10.5811/westjem.2021.8.52657. PMID: 34787558.
12. Sideris A, Holmes TR, Cumming B, Havas T. A systematic review and meta-analysis of predictors of airway intervention in adult epiglottitis. Laryngoscope. 2020;130(2):465-473. DOI: 10.1002/lary.28076. PMID: 31173373.
13. Booth AWG, Pungsornruk K, Llewellyn S, Sturgess D, Vidhani K. Airway management of adult epiglottitis: a systematic review and meta-analysis. BJA Open. 2024;9:100250.

DOI: 10.1016/j.bjao.2023.100250. PMID: 38230383.
14. Katori H, Tsukuda M. Acute epiglottitis: analysis of factors associated with airway intervention. J Laryngol Otol. 2005;119(12):967-972. DOI: 10.1258/002221505775010823. PMID: 16354360.
15. Shapira Galitz Y, Shoffel-Havakuk H, Cohen O, Halperin D, Lahav Y. Adult acute supraglottitis: analysis of 358 patients for predictors of airway intervention. Laryngoscope. 2017;127(9):2106-2112. DOI: 10.1002/lary.26609. PMID: 28493349.
16. Vaid P, Farrell E, Donnelly M. Predictors of airway intervention in acute supraglottitis (AS), a recent 7-year experience. Am J Otolaryngol. 2021;42(6):103084. DOI: 10.1016/j.amjoto.2021.103084. PMID: 34044211.
17. Pineau PM, Gautier J, Pineau A, Emam N, Laccourreye L, Boucher S. Intubation decision criteria in adult epiglottitis. Eur Ann Otorhinolaryngol Head Neck Dis. 2021;138(5):329-332. DOI: 10.1016/j.anorl.2020.12.001. PMID: 33358682.
18. Penella A, Mesalles Ruiz M, Portillo A, Gonzalez-Compta X. Acute infectious supraglottitis in adult population: epidemiology, management, outcomes and predictors of airway intervention. Eur Arch Otorhinolaryngol. 2022;279(8):4033-4041. DOI: 10.1007/s00405-022-07365-z. PMID: 35396955.
19. O'Brien J, Muccio DR, Schrock JW. Association of early steroid and antibiotic therapy with airway outcomes in adult epiglottitis: a 10-year multicenter retrospective cohort study. Acad Emerg Med. 2026;33(4):e70285. DOI: 10.1111/acem.70285. PMID: 42023439.
20. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ. 2021;372:n71. DOI: 10.1136/bmj.n71. PMID: 33782057.
21. Cheung CSK, Man SY, Graham CA, Mak PSK, Cheung PS, Chan BC, et al. Adult epiglottitis: 6 years experience in a university teaching hospital in Hong Kong. Eur J Emerg Med. 2009;16(4):221-226. DOI: 10.1097/MEJ.0b013e328320ad2f. PMID: 19282760.
22. Suzuki S, Yasunaga H, Matsui H, Fushimi K, Yamasoba T. Factors associated with severe epiglottitis in adults: analysis of a Japanese inpatient database. Laryngoscope. 2015;125(9):2072-2078. DOI: 10.1002/lary.25114. PMID: 25546701.
23. Chroboczek T, Cour M, Hernu R, et al. Long-term outcome of critically ill adult patients with acute epiglottitis. PLoS One. 2015;10(5):e0125736. DOI: 10.1371/journal.pone.0125736. PMID: 25945804.
24. Baird SM, Marsh PA, Padiglione A, et al. Review of epiglottitis in the post Haemophilus influenzae type-b vaccine era. ANZ J Surg. 2018;88(11):1135-1140. DOI: 10.1111/ans.14787. PMID: 30207030.
25. Hanna J, Brauer PR, Berson E, Mehra S. Adult epiglottitis: trends and predictors of mortality in over 30 thousand cases from 2007 to 2014. Laryngoscope. 2019;129(5):1107-1112. DOI: 10.1002/lary.27741. PMID: 30582183.
26. Tapiovaara LK, Aro KLS, Back LJJ, Koskinen AIM. Comparison of intubation and trache otomy in adult patients with acute epiglottitis or supraglottitis. Eur Arch Otorhinolaryngol. 2019;276(11):3173-3177. DOI: 10.1007/s00405-019-05624-0. PMID: 31489494.
27. Fan Z, et al. Epidemiology, presentation, management and outcomes of patients with acute epiglottitis: a 10-year retrospective study based on a tertiary hospital in northern China. Eur Arch Otorhinolaryngol. 2025;282:333-340. DOI: 10.1007/s00405-024-09042-9. PMID: 39433571.
28. Schnitzler N, et al. Presentation and management of acute epiglottitis over a 10-year period in a rural setting: a retrospective cohort study. Aust J Otolaryngol. 2025;8:19. DOI: 10.21037/ajo-24-87.
29. Stang A. Critical evaluation of the Newcastle-Ottawa scale for the assessment of the quality of nonrandomized studies in meta-analyses. Eur J Epidemiol. 2010;25(9):603-605. DOI: 10.1007/s10654-010-9491-z. PMID: 20652370.