

Initial Bedside Risk, Gastric Lavage Selection, and Clinically Actionable Toxicologic Events in Hospitalized Psychotropic Drug Poisoning: A 10-Year Retrospective Cohort Study

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Abstract

Background: Gastric lavage remains in use for psychotropic drug poisoning, but whether factors associated with its selection identify patients who develop clinically important toxicity is uncertain. We compared factors associated with lavage selection with factors associated with clinically actionable toxicologic events (CATEs).

Methods: We conducted a single-center retrospective cohort study of 182 patients hospitalized from 2016 to 2025. Initial high clinical risk was defined by abnormal consciousness, respiratory rate, systolic blood pressure, heart rate, oxygen saturation, or electrocardiography. Multivariable logistic regression examined factors associated with lavage and CATEs.

Results: Lavage was performed in 81 patients (44.5%), and 40 (22.0%) experienced a CATE. Arrival within 6 h was associated with lavage selection (adjusted odds ratio [aOR], 2.83; 95% confidence interval [CI], 1.50–5.33), whereas initial high risk was not (aOR, 1.41; 95% CI, 0.74–2.69). Conversely, initial high risk was associated with CATEs (aOR, 5.85; 95% CI, 2.62–13.08), whereas arrival within 6 h (aOR, 0.91; 95% CI, 0.41–2.03) and lavage (aOR, 1.46; 95% CI, 0.65–3.25) were not.

Conclusions: Lavage selection and clinically important toxicity were associated with different factors. A conventional time window should not be used as a stand-alone trigger for lavage; bedside physiology may be more informative for monitoring and escalation decisions.

1. Background

Acute psychotropic drug overdose ranges from uncomplicated exposure to coma, respiratory depression, hemodynamic instability, electrocardiographic abnormalities, and other complications requiring active treatment. Reported drug and dose alone do not reliably identify which course will follow because co-ingestants, individual susceptibility, and evolving toxicity also matter [1–5]. Early assessment must therefore distinguish exposure from clinically important poisoning.

Routine gastric lavage has not been recommended in acute poisoning for decades, and evidence of clinical benefit remains limited even in selected cases. Presentation within a conventional time window indicates only that lavage may still be technically feasible; it does not establish likely benefit or constitute an indication by itself [6–12]. Lavage decisions may nevertheless remain influenced by time since ingestion, reported dose, and the number of drugs taken. These features describe the exposure and the opportunity for decontamination, but not necessarily the patient's physiologic risk or likelihood of requiring more intensive care [13,14].

We assessed the association between gastric lavage and clinically actionable toxicologic events (CATEs), identified factors associated with lavage use, and compared the determinants of lavage with those of CATEs. We also explored whether a prespecified classification of the primary drug's intrinsic

toxicological risk contributed information beyond reported dose and a one-drug versus two-drug classification.

2. Methods

2.1. Study Design, Setting, and Cohort Eligibility

We conducted a single-center retrospective cohort study in the Department of Emergency Medicine at Anhui No. 2 Provincial People's Hospital, a tertiary public hospital in Hefei, China, and reviewed records from January 1, 2016, through December 31, 2025. Candidate cases were identified primarily through International Classification of Diseases, 10th Revision drug-poisoning codes T36–T50; self-harm or intent codes supported case finding only. Every candidate record underwent manual review. The study size was determined by all eligible cases identified during the prespecified 10-year period; no a priori power calculation was used to determine sample size.

Detailed operational definitions, exposure mappings, regression models, and sensitivity analyses are provided in Additional file 1.

This study is reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement for cohort studies; the completed checklist is provided as Additional file 2.

Patients were eligible if they were hospitalized for acute poisoning involving at least one psychotropic drug, including sedative-hypnotics or benzodiazepines, antidepressants, antipsychotics, mood stabilizers, and other or unidentified psychotropic agents. Records were excluded if acute poisoning was not confirmed, no psychotropic drug was involved, or documentation was insufficient to determine the principal exposure or in-hospital outcome.

2.2. Chart Review and Data Abstraction

Two reviewers agreed on eligibility criteria, variable definitions, coding rules, and outcome definitions before chart review [15,16]. The primary reviewer abstracted all eligible records using a standardized form and data dictionary. Data included demographics, poisoning intent, ingestion-to-arrival time, drug exposure and estimated dose, initial vital signs, Glasgow Coma Scale score, oxygen saturation, electrocardiographic findings, gastric lavage, treatment, complications, escalation of care, length of stay, and discharge outcome.

Variables were coded only when documented in emergency, inpatient, nursing, procedure, or discharge records. When exact ingestion time was unavailable, the best available documentation was used to classify arrival as 2 hours or less, 2–6 hours, or more than 6 hours. Ambiguous records were resolved by review of the source record and consensus. The database and operational definitions were locked before analysis.

2.3. Drug-Exposure Mapping and Operational Definitions

Charted drug names and formulations were standardized with a prespecified registry and pharmacologic mapping dictionary. The primary exposure variable was single-drug versus two-drug exposure. The primary drug was also assigned to a study-defined 3-level intrinsic-risk category: Level I for drugs capable of life-threatening toxicity in single-drug overdose or with a narrow therapeutic index, Level II for intermediate risk, and Level III for drugs with a wider safety margin and less frequent severe toxicity. Mixed exposures were assigned the highest level among their components. The full mapping is provided in Supplementary Table S8 and was used only in exploratory analyses.

2.4. Initial Bedside Clinical Risk

Initial clinical risk was based on the earliest objective findings recorded on arrival. High risk was defined by any of the following: Glasgow Coma Scale score of 12 or lower, respiratory rate below 10 or above 30 breaths/min, systolic blood pressure below 90 mm Hg, heart rate above 150 beats/min, oxygen saturation below 90%, or a clinically significant electrocardiographic abnormality. Electrocardiographic abnormalities included QRS widening, QTc prolongation, atrioventricular block, ventricular arrhythmia, marked bradycardia or tachycardia, or another abnormality requiring monitoring or treatment. Patients with none of these findings were classified as low risk. All 6 components were available for all patients.

This arrival-based classification was not designed as a prediction score and was not intended to replace the Poisoning Severity Score, an early warning score, or a validated discharge tool [17]. The Poisoning Severity Score was not used as the primary severity measure because it grades the worst severity over the full clinical course and can include later manifestations that overlap with the study outcome.

2.5. Gastric Lavage and Outcomes

Gastric lavage was coded from explicit documentation in the medical record. It was performed at the treating clinician's discretion; no uniform institutional lavage algorithm was in place. Exposure variables included ingestion-to-arrival time, reported dose of at least 3 times the maximum daily dose, two-drug exposure, intrinsic drug-risk level, and age.

The primary outcome was a study-defined composite of CATEs: toxicologic manifestations, complications, organ dysfunction, or other clinically relevant abnormalities that prompted active treatment, targeted toxicologic therapy, a procedure other than gastric lavage, intensified monitoring, or escalation of care. Gastric lavage alone, routine observation, general supportive care, transient minor symptoms, and isolated laboratory abnormalities without additional management did not qualify. The secondary outcome was major adverse clinical events (MAEs), defined as intensive care or critical care, extracorporeal treatment or hemoperfusion, intubation or mechanical ventilation, respiratory failure, shock, serious arrhythmia, or death. Because 19 MAEs occurred, they were analyzed descriptively.

2.6. Outcome-Overlap Adjudication and Reproducibility

All 40 CATE-positive records were re-reviewed to assess overlap with initial high-risk findings. A broad overlap-robust outcome excluded cases involving only immediate stabilization of an abnormality already present at arrival and cases with a weak or unclear outcome basis. A strict low-overlap outcome retained only events that did not reproduce any initial-risk criterion and was used as a diagnostic analysis. Adjudication categories are shown in Supplementary Table S13.

A second reviewer, unaware of the primary classifications, independently reassessed a random sample of 25 records. Agreement was summarized by crude agreement and Cohen's kappa; disagreements were resolved by consensus.

2.7. Statistical Analysis

Continuous variables were summarized as medians with interquartile ranges and categorical variables as counts and percentages. Comparisons used the Mann–Whitney U test, chi-square test, or Fisher exact test, as appropriate. Exploratory analyses were not adjusted for multiple comparisons.

The prespecified CATE model included initial high clinical risk, gastric lavage, reported dose of at least 3 times the maximum daily dose, two-drug exposure, and age per 10-year increase. A sensitivity model added arrival within 6 hours, and an exploratory model added intrinsic drug-risk level. The lavage model included initial high risk, arrival time, reported dose, two-drug exposure, intrinsic drug-risk level, and age. Sensitivity analyses dichotomized arrival at 6 hours and modeled dose in 3 categories. For Figure 2, the lavage model was refitted using the same core covariates as the CATE sensitivity model; the CATE model additionally included gastric lavage.

The broad overlap-robust outcome used the primary CATE covariate structure. The strict low-overlap outcome was diagnostic only because few events remained. Tests were 2-sided with $P < 0.05$ considered significant. All model variables were complete for all 182 patients; no imputation was performed. Analyses used Python 3.14.4 with pandas 3.0.3, SciPy 1.17.1, statsmodels 0.14.6, and NumPy 2.4.6.

2.8. Ethics

The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of Anhui No. 2 Provincial People's Hospital (approval no. [R]2026-075; June 17, 2026). The requirement for informed consent was waived because the study used de-identified retrospective clinical data.

2.9. Use of Generative AI in Manuscript Preparation

During manuscript preparation, the authors used OpenAI ChatGPT (GPT-5.6) to assist with English-language editing, translation of the authors' own text, manuscript organization, and preparation of manuscript files. It was not used to generate or alter study data or statistical results. All generated material was reviewed and verified by the authors, who take full responsibility for the manuscript.

3. Results

3.1. Cohort Selection and Overall Characteristics

Of 314 hospitalized drug-poisoning records screened, 182 met the eligibility criteria. The remaining 132 were excluded because acute poisoning was not confirmed, no psychotropic drug was involved, or documentation was insufficient to determine the primary exposure or in-hospital outcome. Median age was 25 years, 128 patients (70.3%) were female, and most cases were intentional self-poisoning.

Arrival occurred within 2 hours in 22 patients (12.1%), at 2–6 hours in 82 (45.1%), and after 6 hours in 78 (42.9%). Ninety-six patients (52.7%) had single-drug exposure and 86 (47.3%) had two-drug exposure. Intrinsic drug risk was Level I in 18 patients (9.9%), Level II in 48 (26.4%), and Level III in 116 (63.7%). Initial high clinical risk was present in 71 patients (39.0%), lavage was performed in 81 (44.5%), 40 (22.0%) experienced a CATE, and 19 (10.4%) experienced an MAE (Table 1).

Table 1. Baseline characteristics of the inpatient cohort.

Characteristic	Overall cohort (n = 182)
Age, years	25 (16–48)
Female sex	128 (70.3%)
Intentional self-poisoning	169 (92.9%)
Time from ingestion to ED arrival:	
≤2 h	22 (12.1%)
2–6 h	82 (45.1%)
>6 h	78 (42.9%)
Exposure pattern:	
Single-drug exposure	96 (52.7%)
Two-drug exposure	86 (47.3%)
Intrinsic toxicological risk of the primary drug:	
Level I / high intrinsic risk	18 (9.9%)
Level II / intermediate intrinsic risk	48 (26.4%)
Level III / low intrinsic risk	116 (63.7%)
Dose category:	
<3 times maximum daily dose	44 (24.2%)
≥3 to <6 times maximum daily dose	77 (42.3%)
≥6 times maximum daily dose	61 (33.5%)
Initial high clinical risk	71 (39.0%)
Gastric lavage	81 (44.5%)
Clinically actionable toxicologic events (CATEs)	40 (22.0%)
Major adverse clinical events (MAEs)	19 (10.4%)
Length of stay, days	3 (2–4)

Values are n (%) or median (IQR). ED = emergency department; IQR = interquartile range. Exposure pattern was assigned using predefined pharmacological mapping. The intrinsic toxicological risk classification was study-defined and not externally validated. CATEs were the study-defined primary outcome; MAEs included ICU admission or intensive care, blood purification or hemoperfusion, endotracheal intubation or mechanical ventilation, respiratory failure, shock, serious arrhythmia, or death. The binary variable ≥3 times maximum daily dose was retained for the prespecified regression models; the 3-level dose category is shown descriptively.

3.2. Gastric Lavage Use and Selection

Lavage was performed in 57 of 104 patients (54.8%) arriving within 6 hours and 24 of 78 (30.8%) arriving later ($P=0.001$). Two-drug exposure was more common among patients who underwent lavage, whereas initial-risk, dose-category, and intrinsic drug-risk distributions were similar between groups (Supplementary Tables S2 and S3). CATE and MAE rates did not differ significantly by lavage status.

In the multivariable lavage model, arrival within 2 hours (adjusted odds ratio [aOR], 4.09; 95% confidence interval [CI], 1.46–11.41) and arrival at 2–6 hours (aOR, 2.55; 95% CI, 1.30–5.02) were associated with lavage compared with arrival after 6 hours. Initial high clinical risk was not associated with lavage (aOR, 1.38; 95% CI, 0.71–2.68), and neither were reported dose, two-drug exposure, intrinsic drug risk, or age (Table 2). Results were similar when arrival was dichotomized at 6 hours (aOR, 2.83; 95% CI, 1.49–5.37) (Supplementary Table S9).

Table 2. Factors independently associated with gastric lavage use.

Factor	Adjusted OR (95% CI)	P value
Initial high clinical risk vs. low risk	1.38 (0.71–2.68)	0.348
Time from ingestion to ED arrival:		0.003
≤2 h vs. >6 h	4.09 (1.46–11.41)	0.007
2–6 h vs. >6 h	2.55 (1.30–5.02)	0.007
≥3 times maximum daily dose	1.41 (0.67–2.99)	0.370
Two-drug exposure	1.70 (0.86–3.36)	0.126
Intrinsic toxicological risk of the primary drug:		0.996
Level I vs. Level III	0.96 (0.32–2.87)	0.940
Level II vs. Level III	1.01 (0.48–2.13)	0.972
Age, per 10-year increase	0.93 (0.80–1.09)	0.386

Outcome: gastric lavage. The adjusted model included all listed factors. Overall P values for the 3-level arrival-time and drug-risk variables are from 2-df likelihood-ratio tests; reference categories were arrival >6 hours and Level III. Model likelihood-ratio $P = 0.019$; C-statistic = 0.682; maximum variance inflation factor = 2.85; the model converged without evidence of separation. OR = odds ratio; CI = confidence interval.

3.3. Initial Bedside Risk and Clinical Outcomes

Lavage rates were similar in low- and high-risk patients (41.4% vs 49.3%; $P=0.298$). CATEs occurred in 9.9% of low-risk and 40.8% of high-risk patients ($P<0.001$), and MAEs in 0% and 26.8%, respectively ($P<0.001$). Median length of stay was 3 versus 4 days ($P=0.001$) (Table 3 and Figure 1).

Table 3. Clinical characteristics, treatment intensity, and outcomes according to initial clinical risk status.

Characteristic	Low clinical risk (n = 111)	High clinical risk (n = 71)	P value
Age, years	24 (16–39)	31 (18–69.5)	0.011
Female sex	80 (72.1%)	48 (67.6%)	0.520
Intentional self-poisoning	108 (97.3%)	61 (85.9%)	0.004
Intrinsic toxicological risk of the primary drug:			0.031
Level I / high intrinsic risk	8 (7.2%)	10 (14.1%)	
Level II / intermediate intrinsic risk	24 (21.6%)	24 (33.8%)	
Level III / low intrinsic risk	79 (71.2%)	37 (52.1%)	
Dose category:			0.892
<3 times maximum daily dose	28 (25.2%)	16 (22.5%)	
≥3 to <6 times maximum daily dose	47 (42.3%)	30 (42.3%)	
≥6 times maximum daily dose	36 (32.4%)	25 (35.2%)	
Two-drug exposure	53/111 (47.7%)	33/71 (46.5%)	0.867
Gastric lavage	46 (41.4%)	35 (49.3%)	0.298
CATEs	11 (9.9%)	29 (40.8%)	<0.001
MAEs	0 (0.0%)	19 (26.8%)	<0.001
Length of stay, days	3 (2–3)	4 (2–6)	0.001

Values are n (%) or median (IQR). P values are from chi-square or Fisher exact tests for categorical variables, as appropriate, and Mann–Whitney U tests for continuous variables. Initial high clinical risk was defined by any initial finding of GCS ≤12, respiratory rate <10 or >30 breaths/min, systolic blood pressure <90 mmHg, heart rate >150 bpm, SpO2 <90%, or a clinically significant ECG abnormality. GCS = Glasgow Coma Scale; ECG = electrocardiography; IQR = interquartile range.

3.4. Factors Associated with CATEs

In the prespecified model, initial high clinical risk was associated with CATEs (aOR, 5.82; 95% CI, 2.61–12.98), whereas lavage was not (aOR, 1.42; 95% CI, 0.66–3.07). Reported dose, two-drug exposure, and age were also not associated with CATEs (Table 4).

Table 4. Factors associated with clinically actionable toxicologic events.

Factor	Unadjusted OR (95% CI)	P value	Adjusted OR (95% CI)	P value
Initial high clinical risk vs. low risk	6.28 (2.87–13.72)	<0.001	5.82 (2.61–12.98)	<0.001
Gastric lavage	1.51 (0.75–3.05)	0.251	1.42 (0.66–3.07)	0.374
≥3 times maximum daily dose	1.08 (0.47–2.50)	0.849	1.05 (0.42–2.61)	0.924
Two-drug exposure	1.01 (0.50–2.04)	0.972	1.09 (0.48–2.48)	0.832
Age, per 10-year increase	1.13 (0.97–1.32)	0.110	1.06 (0.89–1.26)	0.512

Outcome: clinically actionable toxicologic events (CATEs). The prespecified adjusted model included all listed factors; all 182 patients had complete data and were included in the analysis. OR = odds ratio; CI = confidence interval.

Adding arrival within 6 hours did not materially change the high-risk estimate (aOR, 5.85; 95% CI, 2.62–13.08). Arrival within 6 hours (aOR, 0.91; 95% CI, 0.41–2.03) and lavage (aOR, 1.46; 95% CI, 0.65–3.25) remained unassociated with CATEs. Figure 2 presents the paired model estimates (Supplementary Tables S9 and S10).

In the exploratory drug-risk model, initial high risk remained associated with CATEs, and intrinsic drug risk was associated with CATEs overall (2-df likelihood-ratio $P=0.026$). Level I, but not Level II, differed from Level III (Supplementary Table S12). CATE rates were 50.0%, 27.1%, and 15.5% across Levels I, II, and III, respectively; lavage rates were similar (Supplementary Table S7).

3.5. Outcome-Overlap and Reproducibility Analyses

After excluding 10 immediate-stabilization-only cases and 3 cases with a weak or unclear outcome basis, 27 events remained in the broad overlap-robust outcome. Initial high risk remained associated with this outcome (aOR, 3.22; 95% CI, 1.34–7.73). The strict low-overlap definition retained 13 events and was diagnostic only (Supplementary Tables S13 and S14).

In the independent sample of 25 records, reviewers agreed on 24 classifications (96.0%; Cohen's kappa=0.884). The discrepant case was resolved by consensus.

4. Discussion

Lavage selection and clinically important toxicity were associated with different factors. Arrival within 6 hours was associated with lavage but not with CATEs, whereas initial high clinical risk was associated with CATEs but not with lavage. Lavage was used in 44.5% of patients and was not associated with lower adjusted odds of CATEs.

Guidelines have discouraged routine gastric lavage for nearly 30 years because clinical benefit has not been established [6–9]. The present findings reinforce the distinction between procedural eligibility and

clinical indication. A short ingestion-to-arrival interval may mean that lavage remains technically feasible, but it should not serve as a stand-alone trigger. Lavage should be considered only when a clinically meaningful reduction in absorption is expected to outweigh procedural burden. Initial bedside risk, by contrast, can guide observation, monitoring, and escalation of care. These data do not establish treatment effectiveness or validate a decision rule [6–14].

Initial high risk remained associated with CATEs after removal of events most likely to overlap with presenting abnormalities. The 6 criteria should not be treated as a lavage score. They summarize physiology at arrival and depend less on an often uncertain ingestion history; their role is to identify patients who may need closer monitoring or active treatment, not to determine decontamination by themselves [18].

Bedside status is only one component of toxicological risk. A patient may initially appear stable after ingesting a drug with a narrow therapeutic index, delayed toxicity, or important cardiotoxicity. Intrinsic drug risk was associated with CATEs overall in exploratory analysis, and Level I differed from Level III, but the sample did not show a consistent gradient across all 3 levels. Published data also show important differences among benzodiazepines, tricyclic antidepressants, lithium, and bupropion in severe toxicity, therapeutic margin, and specific treatment requirements[3–5,19–24]. A larger multicenter dataset is needed to develop and validate a reproducible psychotropic-drug risk hierarchy.

Two-drug exposure accounted for nearly half of the cohort but was not independently associated with CATEs. This binary variable collapses clinically distinct combinations into a single category. Additive sedation, QT prolongation, serotonergic effects, cardiotoxicity, and other interactions depend on the specific agents involved. The null result should therefore not be interpreted as evidence that mixed exposure is unimportant. Future studies should classify common combinations by mechanism and observed outcomes [25–28].

Terminology also matters. At presentation, overdose is an exposure history, whereas poisoning is a clinical diagnosis that becomes clearer as symptoms, physiology, and organ effects evolve. Treating every overdose as equivalent poisoning may encourage uniform management despite substantial heterogeneity. A staged description—suspected overdose at presentation, refined as objective toxicity emerges—may better reflect the clinical course.

This study has limitations. It included hospitalized patients at one center, limiting generalizability to lower-risk patients and other hospitals. Practice may have changed over 10 years, and secular trends in lavage use were not modeled. Retrospective records incompletely captured ingestion time, dose, exact agents, and treatment decisions; indications, contraindications, airway-protection decisions, and clinician rationale for lavage could not be fully analyzed. Lavage was not randomized, and residual confounding by indication prevents causal inference. The study assessed risk of CATEs rather than differential treatment benefit and cannot determine whether high-risk patients benefit more from lavage. CATEs were study-defined and partially overlapped with the initial-risk criteria, although the overlap-robust analysis was similar. The drug-risk classification requires external evaluation.

5. Conclusions

Among hospitalized patients with psychotropic drug poisoning, lavage use was related chiefly to ingestion-to-arrival time, whereas CATEs were related chiefly to initial bedside risk. Drug-specific toxicological risk provided an exploratory signal. Multicenter studies should test whether decisions based on bedside physiology, drug-specific risk, and clinically meaningful co-exposures can reduce low-yield lavage while preserving access for patients likely to benefit.

Abbreviations

aOR, adjusted odds ratio; CATE, clinically actionable toxicologic event; CI, confidence interval; ECG, electrocardiogram; ED, emergency department; GCS, Glasgow Coma Scale; IQR, interquartile range; MAE, major adverse event; OR, odds ratio; SpO₂, peripheral oxygen saturation; STROBE, Strengthening the Reporting of Observational Studies in Epidemiology.

Declarations

Ethics approval and consent to participate

The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of Anhui No. 2 Provincial People's Hospital (approval no. [R]2026-075; June 17, 2026). The requirement for informed consent to participate was waived because this retrospective study used de-identified clinical record data.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and/or analysed during the current study are not publicly available because they contain retrospective clinical record data, but de-identified analytic data may be available from the corresponding author on reasonable request, subject to institutional and ethics approval requirements.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

XR conceptualized the study, developed the methodology, performed the investigation and data curation, contributed to formal analysis and visualization, and drafted the manuscript. ZW contributed to validation, formal analysis, and critical revision of the manuscript. YX supervised the study and critically revised the manuscript. All authors read and approved the final manuscript.

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Figures

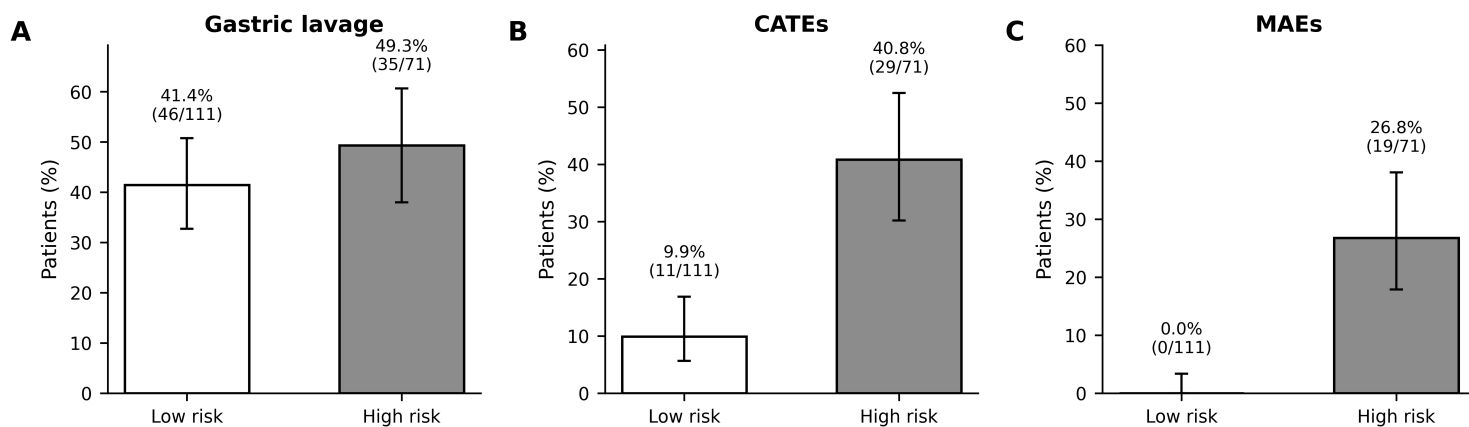


Figure 1

Gastric lavage use and clinical outcomes according to initial clinical risk. (A) Gastric lavage use; (B) clinically actionable toxicologic events (CATEs); and (C) major adverse clinical events (MAEs). Values above the bars are percentages and event counts. Error bars are Wilson 95% confidence intervals for the corresponding proportions.

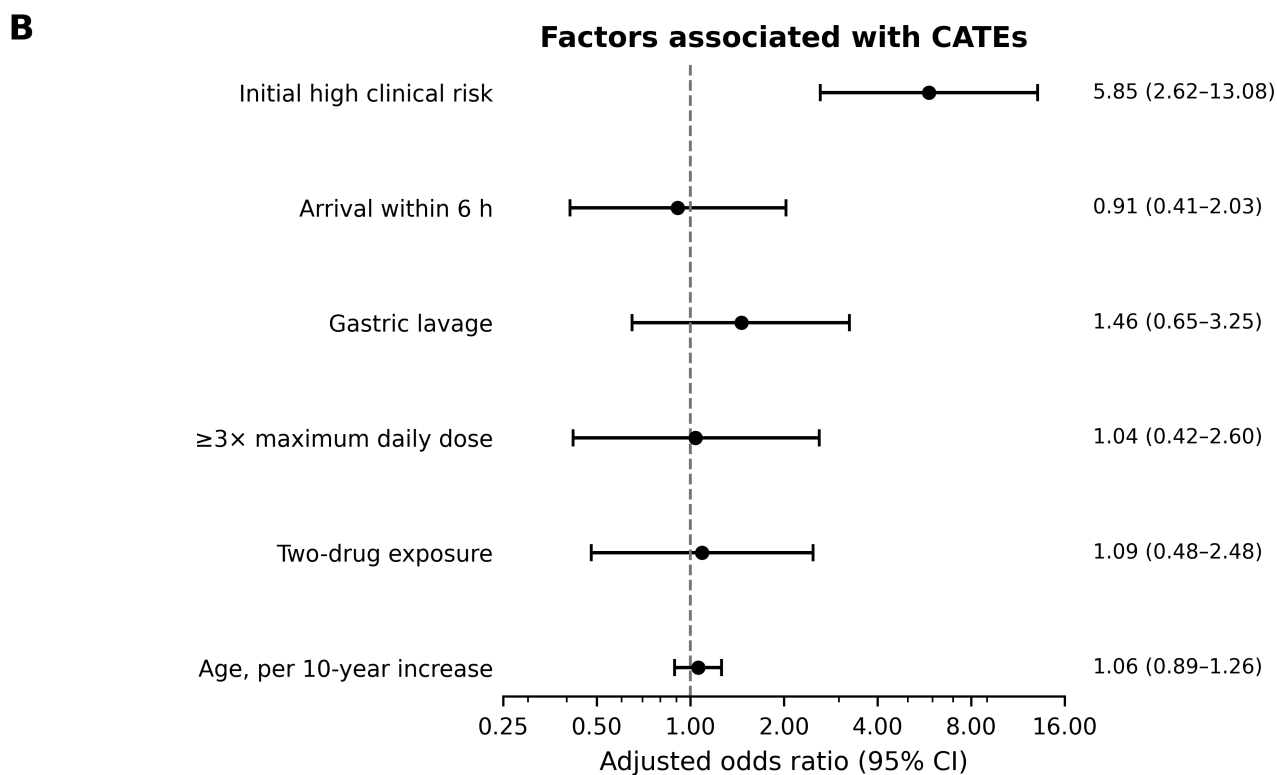
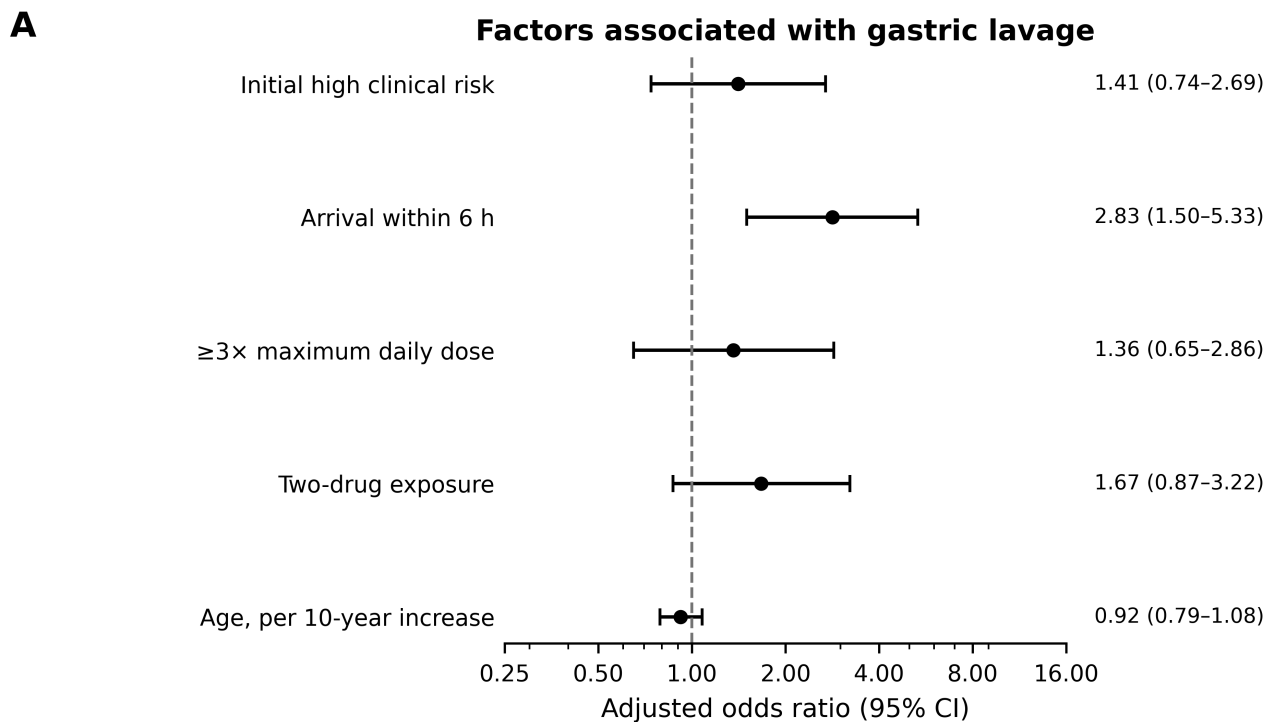


Figure 2

Adjusted associations with gastric lavage use and clinically actionable toxicologic events. (A) Paired-comparison model for gastric lavage use. (B) CATE sensitivity model additionally including gastric lavage as a covariate. Shared variables were initial high clinical risk, arrival within 6 h, ingestion of at least 3 times the maximum daily dose, two-drug exposure, and age per 10-year increase. Points are adjusted odds ratios and horizontal lines are 95% confidence intervals; the dashed vertical line indicates

an odds ratio of 1.0. Exact estimates are reported in Supplementary Tables S9 and S10. CATEs = clinically actionable toxicologic events.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Additionalfile1SupplementaryTablesS1S14.docx](#)
- [Additionalfile2STROBEChecklist.docx](#)