



# Does non-invasive airway management lead to better outcomes in comatose patients with suspected acute poisoning?

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**Ratings:** *Methods*—(4/5); *Usefulness*—(4/5)

## Objectives

To determine the effect of withholding intubation vs routine practice on clinical outcomes of acutely poisoned patients with depressed LOC.

## Methods

### Design

Multicenter randomized control trial (RCT).

### Setting

Twenty emergency departments and one intensive care unit in France.

### Subjects

Patients  $\geq 18$  years of age with suspected acute poisoning and a Glasgow coma score (GCS)  $< 9$ .

### Intervention

Withholding intubation unless an emergency intubation criterion was met within 4 h of presentation, or up to when the patient had an increase in GCS  $> 8$ .

### Comparison

Intubation at the discretion of the treating physician.

## Introduction

### Background

Poisoned patients with depressed levels of consciousness (LOC) may be at increased risk for aspiration and related complications. Intubation is often recommended for airway protection.

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## Outcomes

The primary outcome was a hierarchical composite of in-hospital death, length of ICU stay and length of hospital stay. This was expressed as a win ratio where each patient-to-patient comparison was assigned a win, loss or tie based on a hierarchy of end points ordered by clinical importance. Secondary outcomes of this study included adverse events secondary to intubation and pneumonia within 48 h.

## Main results

225 patients were randomized into the intervention ( $n = 116$ ) and control groups ( $n = 109$ ). Most patients were male (62%), with a median GCS of 6 [IQR, 3–7]. Associated toxins included alcohol (67%) followed by benzodiazepines (39%). Some patients had multiple exposures. The composite endpoint was significantly better in the intervention group, with a win ratio of 1.85 (95% CI, 1.33–2.58) (Fig. 1). This was driven by a shorter length of ICU stay (RR = 0.39, 95% CI 0.24–0.66) and length of hospitalization (RR = 0.74, 95% CI 0.53–1.03) since there were no deaths in either group. Secondary outcomes were more favourable among the intervention group with fewer ICU admissions (39.7% vs 66.1%; absolute risk difference, – 29.2 percentage points [95% CI – 41.0–17.4]), fewer adverse events during intubation (6.0% vs 14.7%; absolute risk difference – 8.6 percentage points, 95% CI, – 16.6–0.7) and fewer occurrences of pneumonia (6.9% vs 14.7%; absolute risk difference – 7.8 percentage points, 95% CI, – 15.9–0.3).

## Appraisal

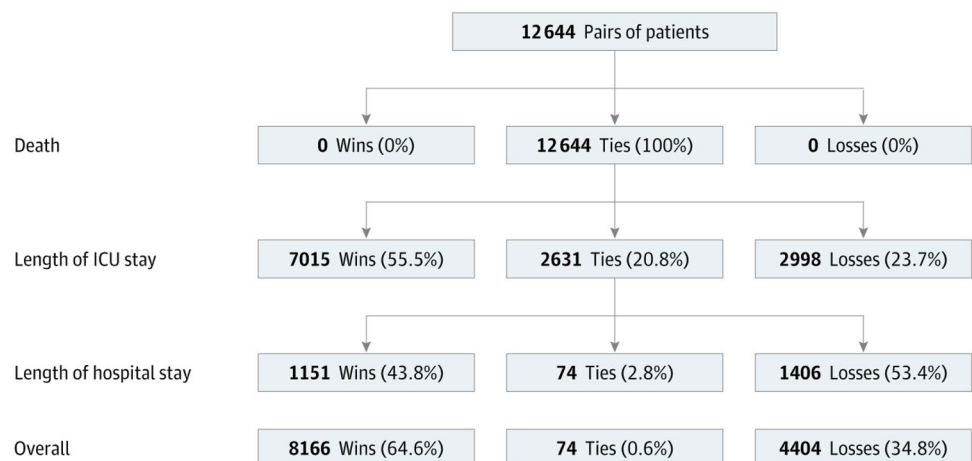
### Strengths

- Prospective multicenter RCT.
- First RCT to study this important clinical question.
- Intention-to-treat primary analysis.
- Important, patient-oriented outcomes.
- Equal distribution of substances ingested between groups including benzodiazepines and GHB.
- Included many patients with profoundly decreased LOC (GCS = 3).

### Limitations

- Unblinded trial; cannot control for potential Hawthorne effect.
- Primary composite outcome included in-hospital mortality without any patient deaths in either group.
- Inadequate explanation of adverse events. It is unclear where the  $n = 113$  (intervention group) and  $n = 107$  (control group) were derived. Furthermore, adverse events from intubation should not be reported among patients who were not intubated.
- Cohort of primarily alcohol intoxicated patients for whom intubation is rarely indicated, with a lack of granularity with respect to coingestants between groups.
- Excluded patients who overdosed on cardiotoxic medications or substances with a reversal agent.
- Lack of generalizability in the Canadian context where prehospital assessments are not routinely done by physicians.
- No measurement of impact on ED workflow, where intervention shifts care from ICU to ED team.

**Fig. 1** Distribution of Wins, Ties and Losses for Patients



## Context

The Glasgow coma scale was initially developed to aid assessment of head injured trauma patients. Over time, a low composite GCS score evolved into a surrogate marker for an unprotected airway, driving the mantra “GCS  $\leq$  8, then intubate” [1]. Observational studies suggest that a low GCS score does not necessarily predict the need for intubation among poisoned patients, where depth and duration of impairment is a manifestation of drug toxicity and not structural brain injury [2, 3]. Among Toronto emergency medicine and medical toxicology experts, decisions to intubate poisoned patients are based on expected clinical course, informed by ingestion history, and physiologic parameters indicating inadequate ventilation.

### Bottom line

This study adds to the evidence that using a conservative airway management strategy among poisoned patients with a depressed LOC may lead to better outcomes including fewer ICU admissions and decreased length of hospitalization.

## Declarations

**Conflict of interest** All authors declare they have no conflicts of interest.

## References

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