



# Early tracheostomy in the intensive care unit: Systematic review and meta-analysis

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## Introduction

Critical care patients sometimes have difficulty being weaned from the ventilator, and mechanical ventilation/intubation is associated with a host of complications. Recent studies suggest that transition to tracheostomy within 10 days may have better outcomes than longer-term intubation. The purpose of this study was to perform a systematic review and meta-analysis of the recent literature on outcomes for early tracheostomy.

## PICO Question

**Population:** Adult ICU patients who require ventilatory support.

**Intervention:** Early ( $\leq 10$  days) versus late tracheostomy ( $> 10$  days) in mechanically ventilated patients.

**Comparison:** Outcomes of patients trached early versus late.

**Outcomes:** Mortality, ventilator-acquired pneumonia (VAP), and pneumonia.

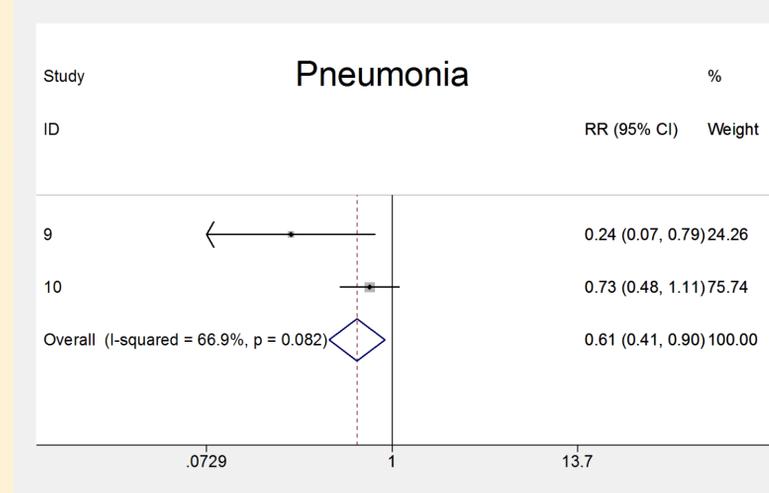
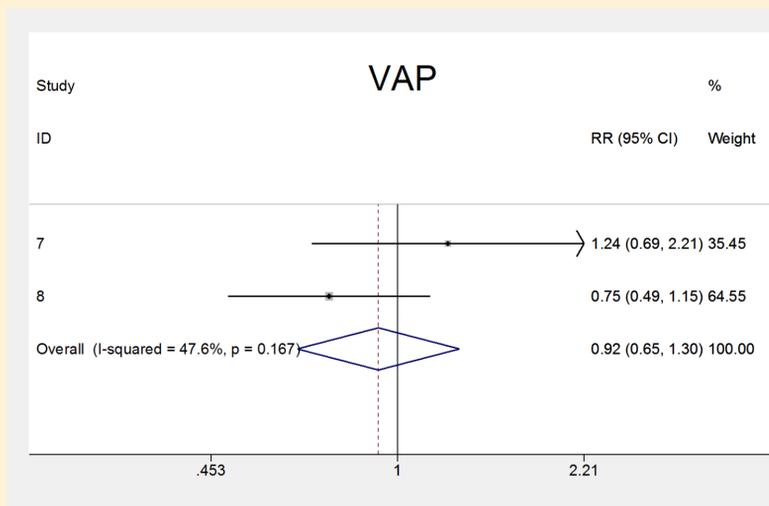
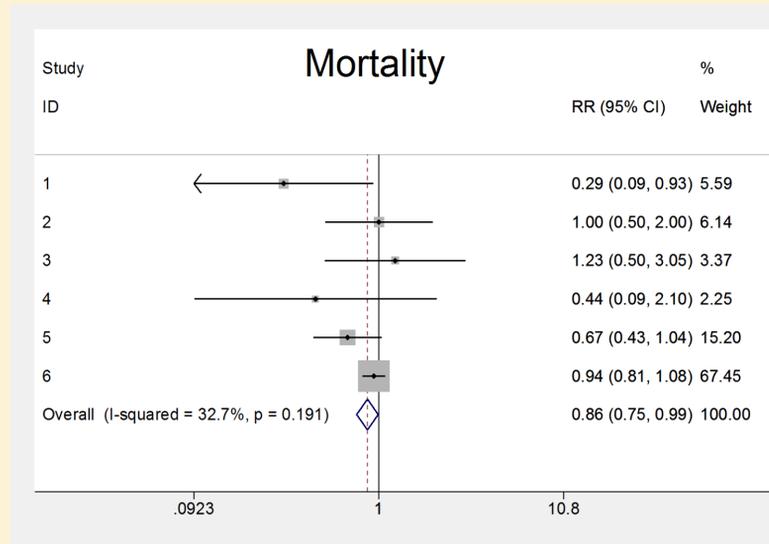
**Question:** Is early tracheostomy associated with lower rates of mortality, VAP, and pneumonia in adult critical care patients requiring mechanical ventilation relative to late tracheostomy?

## Methods

- A literature search was conducted using the Medline database.
- Key words included “early tracheostomy” and “intubation.”
- This search yielded 14 articles published between January 1, 2012 and September 24, 2013.
- There were six articles that could be combined for mortality, two articles for VAP, and two articles for pneumonia.
- Risk ratios for the outcomes across studies were pooled using the Mantel-Haenzel fixed effects model.

## Results

- Across six studies that reported mortality, patients undergoing early tracheostomy had significantly lower risk of in-hospital mortality (RR=0.86,  $p=0.038$ ).
- Across two studies that reported VAP, when combined, early tracheostomy had lower risk of VAP, but the effect was not statistically significant (RR=0.92,  $p=0.64$ ).
- Combining two studies that reported pneumonia, early tracheostomy was associated with a significantly lower rate of pneumonia (RR=0.61,  $p=0.014$ ).



## Discussion

- Early tracheostomy appears to be associated with significantly lower rates of mortality and pneumonia.
- Although the effect for VAP was not statistically significant, the lack of significance may be due to low power.

### Future actions and studies:

- Research 3-4 days for early tracheostomies instead of  $\leq 10$  days.
- Perform a larger prospective randomized trial in a multicenter study.
- Incorporate a field for intubation date in PowerChart with alerts when intubation has exceeded a specified time.
- More effective patient and family education.

## Conclusions

Early tracheostomy reduces rates of mortality and pneumonia. Patients in the ICU who are intubated should be evaluated for tracheostomy within 10 days.

## References

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