



# 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 oral intubation. The purpose of this study was to perform a systematic review and meta-analysis of 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

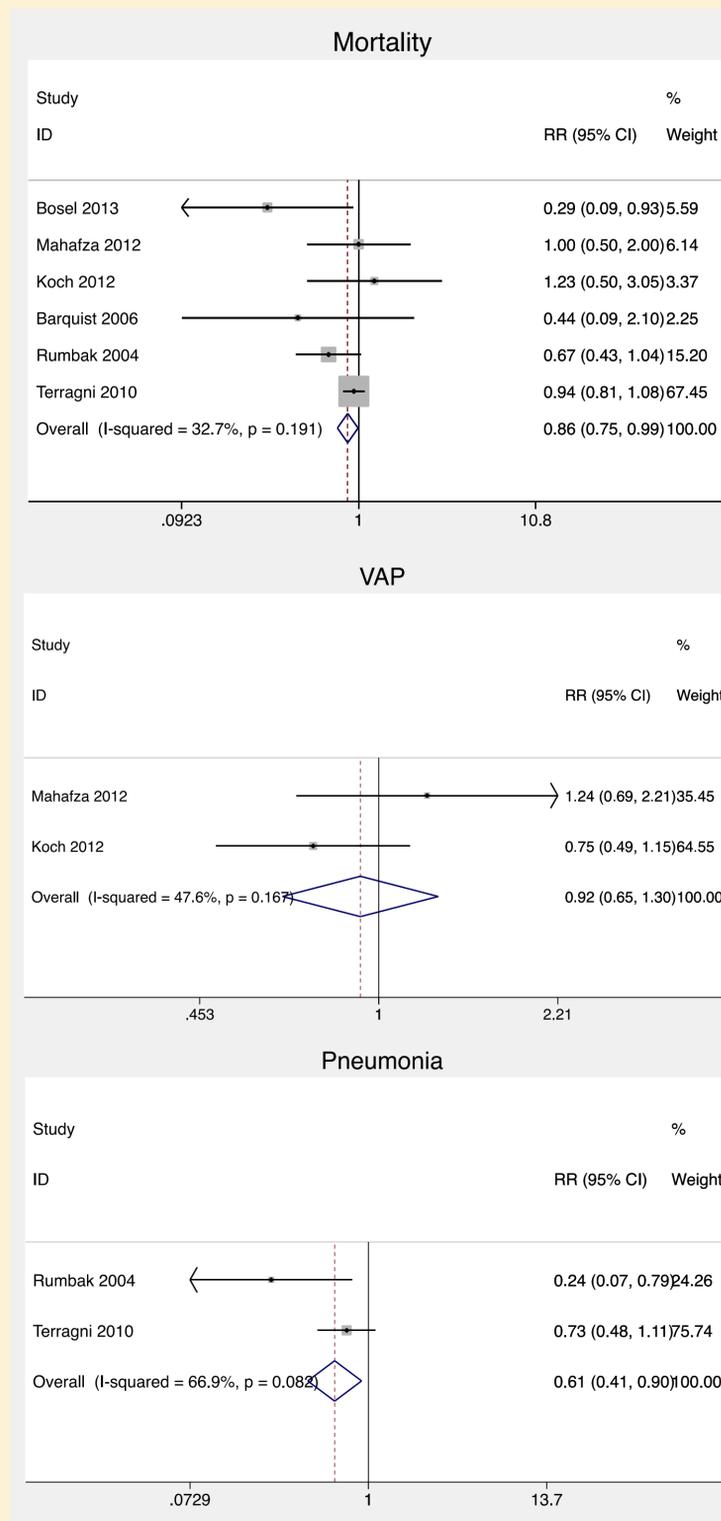
- Conducted literature search using the Medline database.
  - Key words included “early tracheostomy” and “intubation.”
- Yielded 14 articles published between January 1, 2012 and September 24, 2013.
- Six articles were combined for mortality, two articles for VAP, and two articles for pneumonia.
- Risk ratios (RR) for outcomes across studies were pooled using Mantel-Haenzel fixed effects model.

## Results

- For six studies that reported mortality, patients undergoing early tracheostomy had significantly lower risk of in-hospital mortality (RR=0.86,  $p=0.038$ ).
- Two studies for VAP, when combined, showed early tracheostomy had lower risk of VAP, but 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,  $p=0.014$ ).

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## Plots of Risk Ratio for Studies



## Discussion and Implications

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 (small number of studies evaluated).

- Document within the electronic medical record number of days a patient is intubated. Create a field for intubation date and alerts when intubation has exceeded a specified time.
- Create standard assessment tool for RNs and MDs to evaluate need for tracheostomy.
- Begin discussion early with patients and families. Provide written education.
- Continue research: early tracheostomy at 3-4 days instead of  $\leq 10$  days.
- Perform a larger prospective randomized trial in a multicenter study.

## Conclusions

Early tracheostomy reduces rates of mortality and pneumonia. ICU patients who are intubated should be evaluated for tracheostomy within 10 days. Providing patients and families with information on benefits and risks of tracheostomy is important for informed decisions.

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