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# Continuous Subglottic Suctioning of Intubated Patients in the ICU

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## Abstract

Ventilator associated pneumonia (VAP) is a common complication in mechanically ventilated patients. It causes substantial morbidity and mortality, as well as substantial cost to the patients and healthcare systems. One of the major risk factors identified for risk of VAP is the aspiration of secretions from the oropharynx. One intervention aimed at decreasing the incidence of secretion aspiration is an endotracheal tube (ETT) that can be hooked up to suction, providing continuous subglottic suctioning. The purpose of this paper was to explore the use of continuous subglottic suctioning and its effects on the incidence of ventilator-associated pneumonia. Review of literature explored studies including randomized control trials and meta-analyses that measured the effects of continuous subglottic suction on the incidence of VAP as well as length of time on ventilator. This information was utilized to determine if there is a statistically significant difference in the rates of VAP with continuous subglottic suction as compared to traditional oral care measures. The review demonstrated that there was a statistically significant decrease in the rates of VAP in ventilated patients that receive continuous subglottic suctioning.

## Introduction

VAP is a serious, potentially fatal lung infection that develops in ventilated patients. Hospitals have implemented many different strategies aimed at decreasing the rates of VAP, most have been met with limited success (Lahoorpour, Delpisheh, & Afkhamzadeh, 2013). Continuous subglottic suction is a relatively new therapy in which patients are intubated with a specialized endotracheal tube that has a port that allows suction to be administered below the area of the glottis. This therapy has been implemented to reduce the amount of oral secretions that migrate down the endotracheal tube into the lungs, thus possibly reducing the occurrence of pneumonia caused by these secretions. Research studies were selected based on the criteria that the researchers investigated subglottic suctioning, specifically continuous subglottic suctioning compared to traditional endotracheal tubes.

## Statement of the Problem

VAP is a serious nosocomial infection causing significant morbidity and mortality. More effective prevention measures need to be established to reduce incidence of VAP.

## Research Question

1. What constitutes a VAP?
2. What are risk factors for developing VAP in critically ill patients?
3. In ventilated patients in the ICU, does continuous subglottic suctioning compared to traditional endotracheal tubes reduce the incidence of VAP?

These questions are fundamental to understanding VAP, and eventually making informed choices that improve the lives of patients. These questions will be explored fully in the subsequent sections.

## Literature Review

VAP is defined as a pneumonia that develops 48 hours or longer after mechanical ventilation is given by means of an endotracheal tube or tracheostomy. VAP results from the invasion of the lower respiratory tract and lung parenchyma by microorganisms. Intubation compromises the integrity of the oropharynx and trachea and allows oral and gastric secretions to enter the lower airways. VAP is a substantial cost in health care both in terms of dollars spent on patient care, and in mortality and morbidity of ventilated patients.

Santana et al. 2010 states, "Cannulae combined with supra-cuff suction devices enable the suction of subglottic secretions is beneficial to critically ill patients because these devices reduce VAP incidence and, consequently, hospital costs—with no large-scale adverse effects."

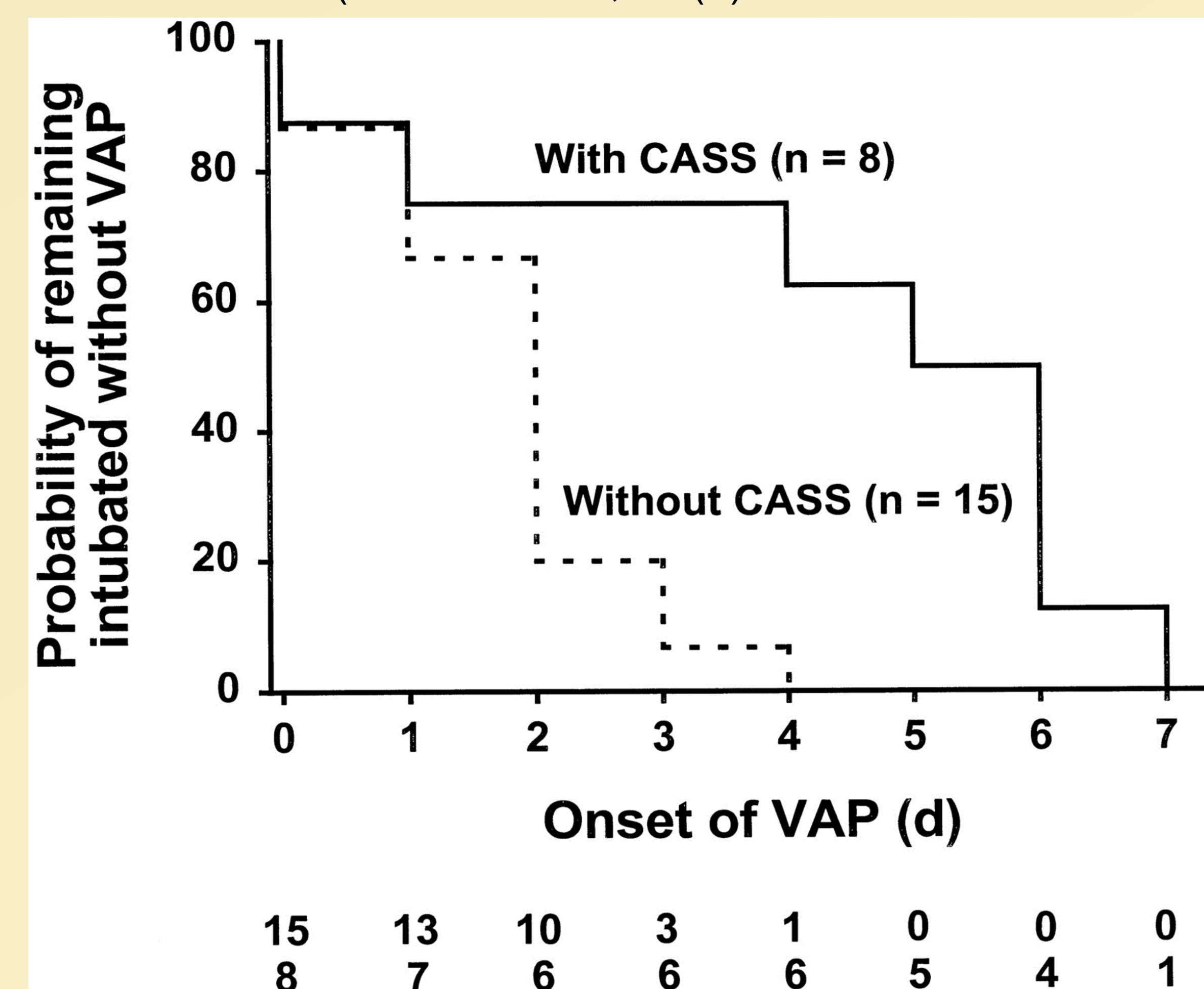
Artigas et al. 1995 found, "We found that the use of continuous aspiration of subglottic secretions in intubated patients reduced the incidence of ventilator-associated pneumonia by 43.4%."

In summary, ventilator associated pneumonia has been shown to be a significant problem for intubated patients in the ICU. It has shown to increase morbidity and mortality, and most prevention efforts have little or no effectiveness. The literature review provided evidence regarding the effectiveness of continuous subglottic suctioning in decreasing the incidence of VAP in a cost effective way. There is some question as to their overall safety, and this is an area of continued research. The discussion will answer the question of whether continuous subglottic suction has the ability to decrease the incidence of VAP.

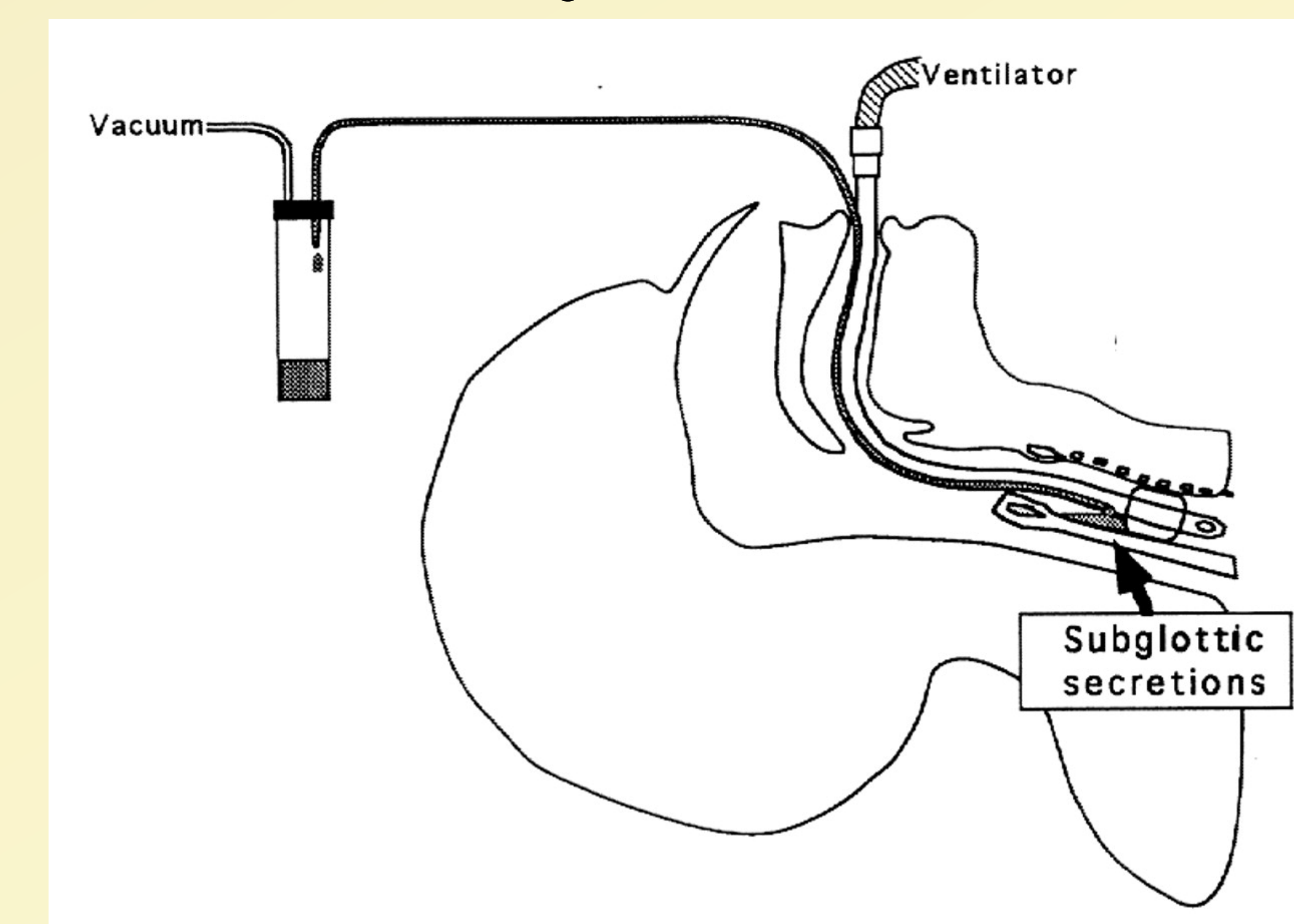
## Discussion

There is a litany of information available on the subject of VAP prevention; the articles reviewed here have shown that prevention is multifactorial. Continuous subglottic suctioning is a very helpful tool that can aide in VAP prevention. As medicine progresses, it is vital that we use evidence based medicine to change our practices to best serve our patient populations.

Continuous Aspiration of Subglottic Secretions, and it's effect on VAP (CHEST. 1999;116(5)1339-1346.



## Continuous Subglottic Suction Catheter



## Applicability to Clinical Practice

In order for continuous subglottic suction catheters to become implemented into clinical practice in hospitals, there needs to be push from physicians. As continuous subglottic suctioning becomes more and more accepted into medical literature along with numerous trials showing almost complete consensus that VAP rates can be significantly lowered with subglottic suctioning, the path towards implementation will become clearer. If there becomes a clear consensus on the medical benefit of continuous subglottic suctioning, the burden falls on the manufacturers to demonstrate cost-effectiveness with their product. The reality is that in order for continuous subglottic suctioning to be feasible, there needs to be a way to assess patients at higher risk for VAP. It would most certainly be too expensive to implement an across the board change to subglottic suction endotracheal tubes. There are many hospital patients that have minimal risk for VAP such as patients intubated for OR cases, or patients intubated in the Emergency Department for drug overdoses, which typically are extubated in less than 48 hours, these patients would not need the more costly continuous subglottic catheter. This will need to be a gradual implementation.

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