

## " Effects of Quality Tools Implementation on Reducing the Risk of Ventilator Associated Pneumonia at El - Mabarrah Hospital in Port said Governorate "

### Authors

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### **Abstract:**

### **Background:**

VAP is still one of the problems facing hospitals and increases the risk of Nosocomial infection (1).

VAP has a close association with increased attributable deaths (2).

The most common risk factor to VAP the aspiration of contaminated pharyngeal,

Accumulation of secretions in the endotracheal tube, Tubes with cuffs made of polyurethane

rather than polyvinyl chloride (3).

**METHODS:**

- Check list
- Flow chart

**Conclusion :- IMPROVE HEALTH CARE.**

- The aim to Establishment of quality standards tools to reduce the risk of Ventilator association pneumonia.
- Implementation of policy and procedures for reducing the Risk of VAP.

**Keywords :**

Quality tools - reduce the risk of VAP - Ventilator association pneumonia - intensive car

## Introduction

Hospital-acquired pneumonia (HAP) is the most common infection in the intensive care unit (ICU). This infection includes two different pathways:

- **Ventilator-associated pneumonia (VAP):** pneumonia associated with mechanical ventilation
- **Severe pneumonia developed during the hospital stay (HAP)**

The incidence of VAP ranges from 1.9 to 3.8 per 1000 days of mechanical ventilation in the US and exceeds 18 per 1000 days of mechanical ventilation in Europe. (Koulenti D, Tsigou E, Rello J, 2016).

Nosocomial pneumonia is the most common infection in ICU, when considering the timing of these infections. Non-ventilator (HAP) occurs in patients admitted to the hospital for at least 48 hours and VAP is defined as occurring more than 48 hours after the initiation of mechanical ventilation. Accurate data on their epidemiology are limited by the lack of standardised diagnostic criteria.

In the US, the incidence of HAP was 1.6%, representing a rate of 3.63 per 1000 patient-days (Giuliano .KK, Baker. D, Quinn .B,2017). <sup>(4)</sup>

Quality improvement (QI) in organisations does special efforts to enhance the quality of care and customer outcomes (Finney et al. 2000; Chong et al. 2003; Raposo et al. 2009; Lee et al. 2012). <sup>(5)</sup>

The process of QI requires the active use of management quality tools by organization managers to improve the quality of production.

Recently, there are many quality management tools, so selecting the appropriate tools is not always easy (Krakowiak-Bal and Salamon, 2011).

Statistics has a unique place in the modern society (Máchal et al., 2013). It is used in the analysis of social and economic phenomena, not only in science and research, but also as an important instrument of state policy (Kadnár et al., 2014).

<sup>(6)</sup>

## **Aim of work**

### **The research project is aiming to:**

- Establishment of quality standards tools to reduce the risk of association pneumonia in ICU at El-Mabarah Hospital.
- Application of select quality tools to reduce the risk of association pneumonia in ICU at El-Mabarah Hospital.

## **Methodology**

Methodology about implementation on reducing the risk of ventilator associated pneumonia at El mabarah Hospital in Port Said governorate by collecting data using Quality tools.

### Quality tools used in the study:

#### **1- Check list**

##### **Definition:**

Checklist is type of job help used to reduce risk Failure by compensating for damages and set potential limits of human memory and draw the attention  
Checklist is Tasks are accomplished based on a schedule that specifies the tasks to be performed according to the time of day or other Factors  
A basic example is the 'to do list'. <sup>(7)</sup>

##### **Purpose** <sup>(8)</sup>

**Organization:** Checklists help us implement tasks in a larger order and make sure we don't skip any step in the work and are also efficient and easy to use

**Motivation:** Checklists motivate us to complete tasks and carry out actions

**Productivity:** By having a checklist, you can perform repetitive tasks faster, more efficiently, and with fewer errors.

**Delegation:** By breaking down tasks into specific task.

**Excellence:** Checklists allow us to deliver health care in an effective manner

**First : Check lists** <sup>(9)</sup>

Name of Nurse / -

Date of inspection / -

Items /Description	Observation	Yes	No	N/A	Comments
<b>First:- general policy (PPE)</b>					
1 - Hands should be washed hygienically before installing the laryngeal tube for a patient					
2 - Hands should be washed routinely between the patient and the other, and dried thoroughly and the other					
3- Gloves must be changed between the patient and the patient					
4 - Protective clothing must be worn while handling the patient					
5 - A mask must be worn when dealing with the patient or suctioning					
<b>Second: - When caring for a patient connected to a respirator</b>					
1 - The patient's head and shoulders should be placed at an angle of 30 to 45 degrees					
2 - The fluid or any collection in the laryngeal tube must be suctioned periodically According to the patient's condition, using a suction catheter new every time					
3 - All connections of the respirator between the patient and the other must be changed to be sterilized or disinfected before the next use					
4 - All connections to the ventilator for a single patient must be changed and if contaminated at any time					

5 - The circuit and connection of the respirator for the same patient must be changed every 3-4 days or if the contamination occurs at any time				
6 - A sterile solution should be used when using the nebulizer				
7 - The nebulizer and the connection must be cleaned under running water, then soaked in soapy water for 5 minutes, then dried well, then Clean with alcohol and leave to dry until the smell is gone before next use or soak in peracetic acid for 10 minutes then rinse with a solution of salt or water previously boiled and then dried between use and the other, even if the same patient				
8 - The date the filter was installed is recorded on the filter itself				
9 - The viral bacterial filter must be changed every 24 hours or when contaminated with secretions				
<b>Cleaning and disinfecting the respirator:</b>				
1- The general hygiene of the respirator from the outside must always be maintained.				
2- The ventilator is cleaned from the outside with a cloth containing soapy water at the beginning of each day (in the morning). And when any visible dirt occurs between the patient and the other.				

3- The respirator is disinfected with chlorine 0 100 ppm at the beginning of each day and when any dirt occurs Visible and between the patient and the other.				
4- A circuit (the ventilator connection) is sent to the central sterilization unit to be dealt with when it is changed The patient’s soul or between the patient and the other to be sterilized after cleaning with ethylene oxide, if any, or an autoclave If it is a type that can withstand heat or disinfection with perastic acid after cleaning, as in the policy Use of disinfectants.				
5 - The manufacturer's instructions are followed when wiping the screen part (computer) or 70% alcohol if you allow it.				

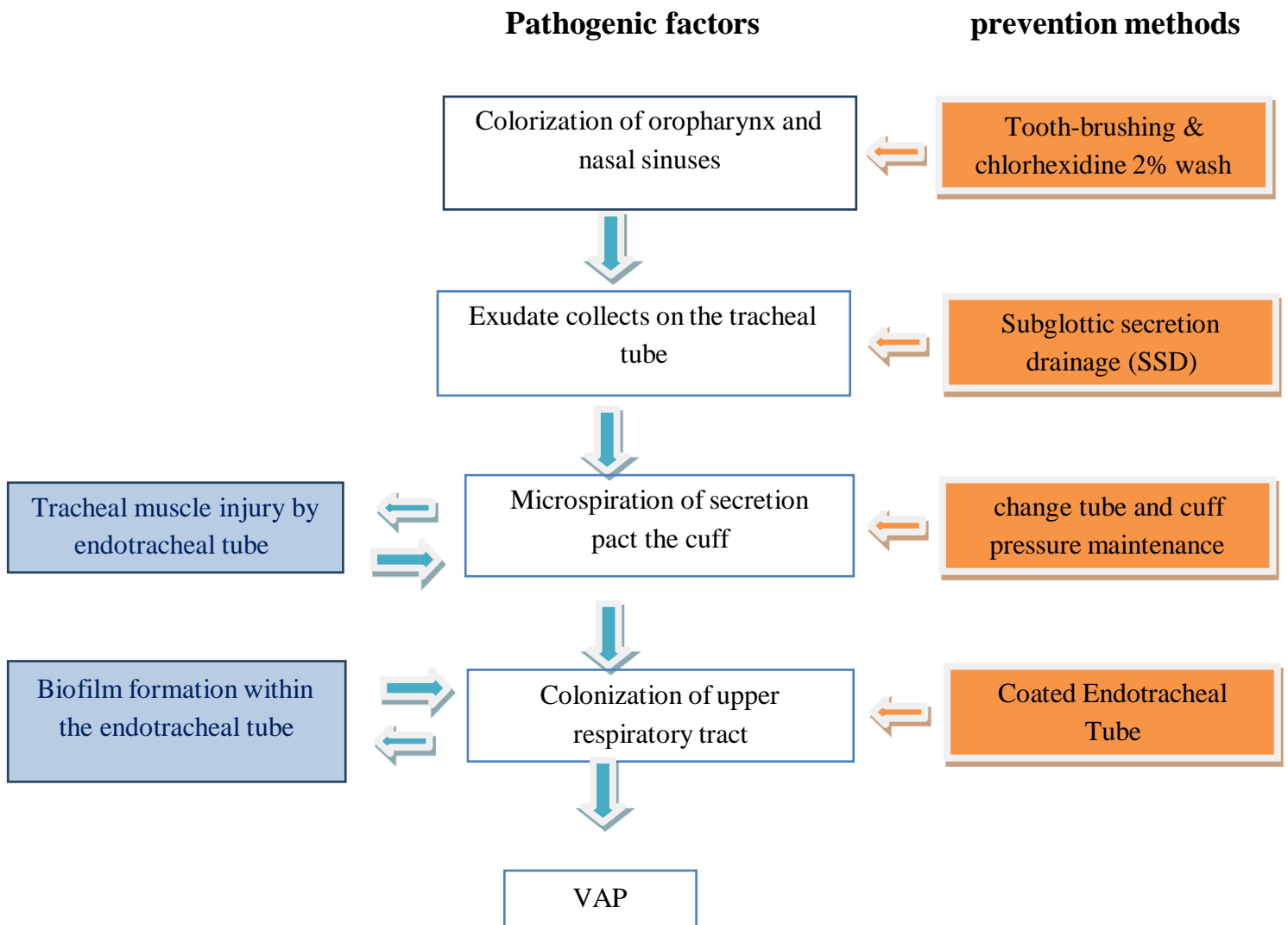
**Table 1: checklist**

**2 - Flow chart :** <sup>(10)</sup>

- 1- Allow all health care team to flow sequence of events in the process of services. 1
- 2- Show unexpected complexity ,problems areas
- 3- 3. Compares and contrasts the actual VS the idea flow to identify improvement opportunist
- 4- 4 .Allow teams to come to an agreement
- 5- Identifies location where additional data are needed
- 6- Servese as training aid for understanding and completing the process.



## Second : Flow chart <sup>(11)</sup>



**Source:** Zolfaghari and Wyncoll 2011

### Conclusion

**This research concluded that**

- The prevalence of hospital acquired pneumonia due to decreased compliance of the medical team to the quality instructions & techniques and sterilization
- Quality improvement focus primarily on efforts that would enhance the quality of care

and customer outcomes

- Establishment of quality standards tools to reduce the risk of VAP in ICU
- Methods used to improve quality including - Regular assessing endotracheal Cuff pressure and frequent suctioning
- Avoid gastric distention and supine position
- regular hand cleaning of soap and alcohol
- Maintenance cuff pressure of endotracheal tube more than or 20 mmhg reduce nosocomial pneumonia and decrease passage of oropharyngeal content into the trachea
- Oral intubation is prefer over nasal intubation
- The previous methods usual on the research had decreased the VAP and increased the patient outcome and less mortality.

## **Recommendation**

**From the conclusion of this research and after studying and using different quality tools, the following are recommended by this research group:**

- The following points should be considered such as regular assessment of endotracheal cuff pressure, maintenance endotracheal suction aspiration procedure, avoidance of gastric distension, and avoid the flat position
- Consideration should be given to treatment of modifiable agents such as tracheostomy and nasogastric tube, tracheostomy, re-intubation, enteral feeding, corticosteroid administration, gastric pH-modifying agents, flat position, history of antibiotic use, absence of infection control practice, contaminated breathing equipment or medications or water.
- Maintenance cuff pressure at 20 mm Hg to reduce VAP, This is by reducing the entry of the contents of the mouth and pharynx through the trachea
- The patient should be kept in a semi-seated position to reduce the risk of injury aspiration pneumonia
- Should be focus on Oral intubation over nasal intubation.
- Care should be taken to closely monitor the retained secretions and subsequent airway obstruction. Continuous suction of subglottic secretions through the tracheal tubes will reduce the incidence of VAP.
- Oral disinfection with chlorhexidine has been shown to reduce the incidence of VAP.

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