A STUDY TO IDENTIFY FACTORS CONTRIBUTING TO VENTILATOR ASSOCIATED PNEUMONIA IN PATIENTS IN MECHANICAL VENTILATION.

PROJECT REPORT

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In Neuro Medical ICU

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CERTIFICATE

Certified that this study to identify factors contributing to ventilator associated Pneumonia in patients who are im Mechanical Ventilation is a bonafide work of **DEVI. R. MOHAN** at **Sree Chithra Thirunal Institute of Medical Science and Technology.**

Submitted in partial fulfillment of the requirement for the **Diploma in Neurology Nursing** from the **Sree Chithra Thirunal Institute of Medical Science and Technology.**

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CONTENTS

CHAPTER - I

INTRODUCTION

Pneumonia is the leading cause of death due to nosocomial infections and the second most common nosocomial infection in United States (The Hospital Infection control Practice Advisory Committee Centre for disease control and prevention 1994).

Intubation and Mechanical Ventilation greatly increase the risk for bacterial Pneumonia because the endo tracheal tube allows direct entry of bacteria into the lower respiratory tract and there by promote bacterial colonization. Identification and prevention of risk factors will prevent the occurrance of ventilator associated Pneumonia.

BACKGROUND OF STUDY

Nosocomial Pneumonia Occuring in the setting of Mechanical Ventilation has been termed Ventilator associated Pneumonia.

Ventilator associated Pneumonia (VAP) occurs 48hrs. or more after intubation. Early onset VAP occurs during the first 4 days of continuous mechanical ventilation where as late onset VAP occurs after 4 days of continuous Mechanical Ventilation. There has been a gradual decline in the incidence of VAP in may developed Countries. This is due to the prevention of risk factors. The Risk Factors.

- ➔ Duration of Mechanical Ventilation.
- ➔ Route of Mechanical Ventilation.
- ➔ Underlying disease condition.

At Studies shows that Nasal placement of Endo tracheal tube and, GI tubes increases the risk of Sinusitis and there by produce Pneumonia.

Immuno supression or the underlying disease condition is a major factor in the development of VAP. If all these modifable risk factors are prevented, VAP also can be controlled.

The pathogens such as Pseudomonasaeruginosa and staphylo coccus are considered us the most frequently isolated pathogens for VAP.

NEED AND SIGNIFICANCE OF STUDY

Ventilator associated Pneumonia will increases the Mortality and Morbity in Hospital. This infection will aggrevate the underlying disease process and thus worsening the condition of the patient, which will lengthen the line of hospital stage. To some extent, some nursing activities will contribute to the development of ventilator associated Pneumonia. This study is done to find out the relationship of selected variables on VAP and the nursing measures that may cause VAP.

STATEMENT OF THE PROBLEM

A study to identify factors contributing to ventilator associated Pneumonia in patients who are in Mechanical Ventilation in Neuro medical ICU at Sree Chithra Thirunal Institute of Medical Science and Technology, Thiruvananthapuram.

DEFINITION OF TERMS

Contributing Factors:- In this study, refers to Type of Intubation, Reason for Intubation, Underlying disease conditions.

Ventilator associated Pneumonia:- Pneumonia that develops in Mechanically Ventilated Patients.

Mechanical Ventilation:- Patients who are put on Mechanical Ventilation from the day of intubation.

OBJECTIVES

- To analyze the incidence of Ventilator associated pneumonia in Neuromedical ICU.
- To identify the relationship of Ventilator associated pneumonia and selected variables.
- To observe the respiratory care provided by the nursing personnel to ventilated patients.

METHODOLOGY

Observational method was used in the study. The data was collected from 10 persons for the study who were put on mechanical ventilator. A Observational chart was made including the selected variables. The validity of the tool were checked by the experts of SCTIMST. The duration of the study is August to October 2005.

LIMITATIONS

This study was limited to:-

- ➔ Patients admitted in Neuro medical ICU.
- ➔ Sample size is limited to 10 samples only.
- ➔ Time for date collection is limited to one month.
- ➔ Previous history of Pneumonia excluded.

SUMMARY

This chapter deals with introduction, background of the study, need and significance of the study, statement of the problem, definitions of terms, objectives of the study, methodology and limitations.

ORGANISATION OF REPORT

Chapter II presents a summary of related studies reviewed, chapter III deals with methodology of this study, chapter IV analysis and interprets the findings and chapter V presents summary of the study, conclusion, implementation, limitation and recommendations.

CHAPTER - II
REVIEW OF RELATED LITERATURE

Review of Literature is an important aspect of any research project from beginning to end. It gives character insight into problem and helps in selecting methodology, tool and analyzing data. Related literature was reviewed in depth, so as to broaden the sunderstanding of selected problem.

1. Studies on diagnosis of Ventilator associated Pneumonia.

W. Michal Scheld (1991) conducted a study in district hospital of Virgina. In his study 100 mechanically ventilated patients who received sucralfate or antacids . After exclusion of patients patients. 10% of patients developed VAP. The most commonly isolated pathogen was Pseudomonasaeruginosa and staphylococcus auerus.

J.J. Inglis (1993) conducted a twelve month review causus of VAP is an Neuro intensive care unit, During 12 months 640 pts where admitted in ICU among 27 pts were found to be infected. The pathogen isolated was staphylo coccus and the Route of intubation was oral route. On the Basis of study, the risk of staphylo coccas Pneumonia is common in neurological conditions.

2. Studies on Effect of Rist factors on VAP

A. Martini Gobi (2003) conducted examine the effect of a closed Endo tracheal sectioning on VAP. The study was conducted in ICU of an University Hospital Texas. Data collected from July to October 2003. In mechanically ventilated patients were randomnly divides into 2 groups 32 for closed Endo tracheal sectioning 38 for open section. Time of sectioning in CES was shorter that open. On conclusion CES prevented VAP and was cost effective.

3. Studies on Prevention of VAP

Cutler. J. R.N (2003) conducted a study to find out the importance of oral care in patients receiving mechanical ventilation oral care practices were observed for 253 patients on Base line period, oral cleansing was by suctionswabs . After introduction of interventional period, only 13% of patients had VAP. By this study as evidance based oral cleansing prptocol was developed.

Mary Jo (2004) conducted to describe the need of Back rest elevation on the prevention of ventilator associated Pneumonia 66 [ts were monitored 276 patient days. Mean back rest elevation for the entire study period was 21.7. Back rest elevations were less than 30. A model for predicting clinical pulmonaly infection score at day 4. On conclusion, combination of early low back rest elevation and severity of illness affected the incidence of ventilator associated Pneumonia.

SETTINGS

The study was conducted in **Sree Chithra Thirunal Institute for Medical Science and Technology, Trivandrum.**

The rationale for selecting SCTIMST for study was the familarity of investigator with this institution. It is a tertiary refferal hospital.

POPULATION

The population for the study was the patients admitted in Neuro Medical ICU in SCTIMST and intubated for the first time.

SAMPLE AND SAMPLING TECHNIQUES

Convenient sampling technique was used to select the samples for the study. The investigator took 10 samples for study from four weeks duration. The duration of study from four weeks duration. The duration of study period included from August 2005 to October 2005.

CRITERIA FOR SAMPLE COLLECTION

Inclusion Criteria

- Patients admitted in Neuro medical ICU.
- Patients intubated for the first time.

CHAPTER -III
METHODOLOGY

INTRODUCTION

Methodology is a way of Systemically solving the problem. This chapter provides a brief description of different steps takes to conduct this study. It included research approach research design, setting, the sample and sampling techinique, development of tool, description of tool, pilot study, data collection procedure and plan of analysis.

RESEARCH APPROACH

Observational method was selected. The objectives of study were:-

(1) To analze the incidence of Ventilator associated Pneumonia in Neuro Medical ICU.

(2) To identify the relationship of VAP and selected variables.

(3) To observe the respiratary care provided by the nursing personel to ventilated patients.

RESEARCH DESIGN

Research design is concerned with overall frame work for conducting the study. For fulfilling the objectives of the study, the following design an utilized for collection and analysis of data.

EXCLUSION CRITERIA

Patients who previousely had Pneumonia.

DEVELOPMENT OF TOOL

An extensive review and study of literature helped in preparing items for the tool.The tools were examined and content validity is tested by the experts of SCTIMST. An observational chart was prepared based on the literature including the selected variables.

Steps taken for the development of tools are:-

Step - 1 : A observational chart containing the selected variables such as Reason for intubation, type of intubation etc was made based on the literature reviewed and on experts opinion.

Step - 2 : The tool was pilot tested on 2 patients. They were observed for 1st 72 hrs of intubation.

Step - 3 : The pilot study gave information regarding the feasibility and effectiveness of study. For each patient CPIS score was done. Then the study was continued.

DESCRIPTION OF TOOL

The tool used for study consisted of two parts.

Part - I :- It comprised of demographic characteristics of ventilated patients such as Age, Sex, diagnosis, date of intubation, length of hospital stay.

Part - II :- It consists of time schedule for the observation. The clinical pulmonary infection score, Reason for intubation, type of intubation underlying diseases.

For each patient, all the data is collected 3 times a during the study, within 24hrs of intubation, at 48 to 71 hrs after intubation and 72 to 96 hrs of intubation. Each variable is assigned points and a total CPIS is obtained (0-12) is obtained. This helped in analysis.

PILOT STUDY

After obtaining permission from the authorities study started on 26/08/05. The purpose of this pilot study was to modify the tools and check the feasibility of the study with necessary modification tool was pilot tested on a convenient sample of 2 patients initially. Each responds scoring also done, this study was continued with clinical pulmonary infection score.

DATA COLLECTION

The data were collected from the Neuro Medical ICU of SCTIMST. Formal permission was obtained from the authorities of SCTIMST. Period of data collection was from 2nd September 2005.

PLAN OF ANALYSIS

A plan for data analysis was developed by the investigator after pilot study. The data obtained from the observation would be analysed by descriptive analysis. Percentages would be used for describing the sample. Both pie up bar diagram would be used to represent the distribution of scores in different content areas.

SUMMARY

This chapter presented the research approach used for the study, design of the study, settings of the study, sample and sampling techniques development of description of tool, pilot study data collection proceedure and plan of analysis.

CHAPTER - IV

ANALYSIS AND INTERPRETATION

This chapter analyses and interprets the data obtained from observational study done on ventilated patients in Neuro Medical ICU in SCTIMST, Trivandrum.

The purpose of the present study was to identify the relationship of VAP and selected variables.

The analyzing of data are presented as

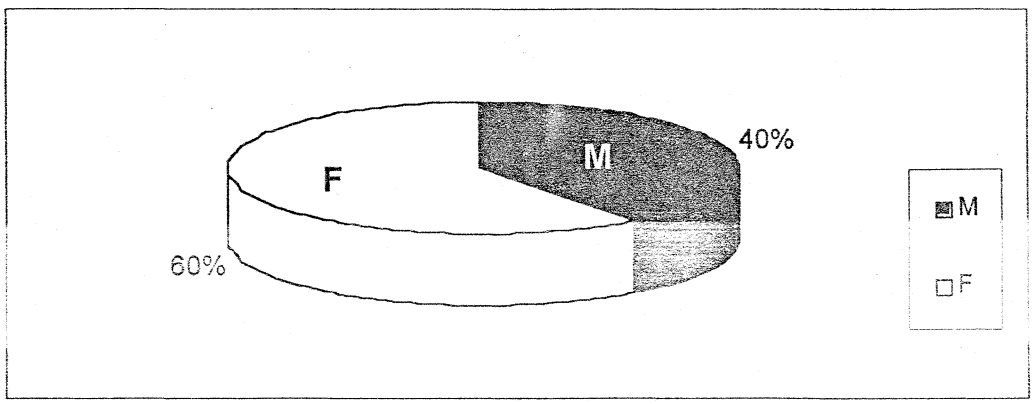
1. **Sample characteristics**
2. **Data on the patients with risks factors to VAP.**

I. Description on Sample Characteristics

Sample of 10 ventilated patients were selected for the study. The demographic data included were age, sex and diagnosis.

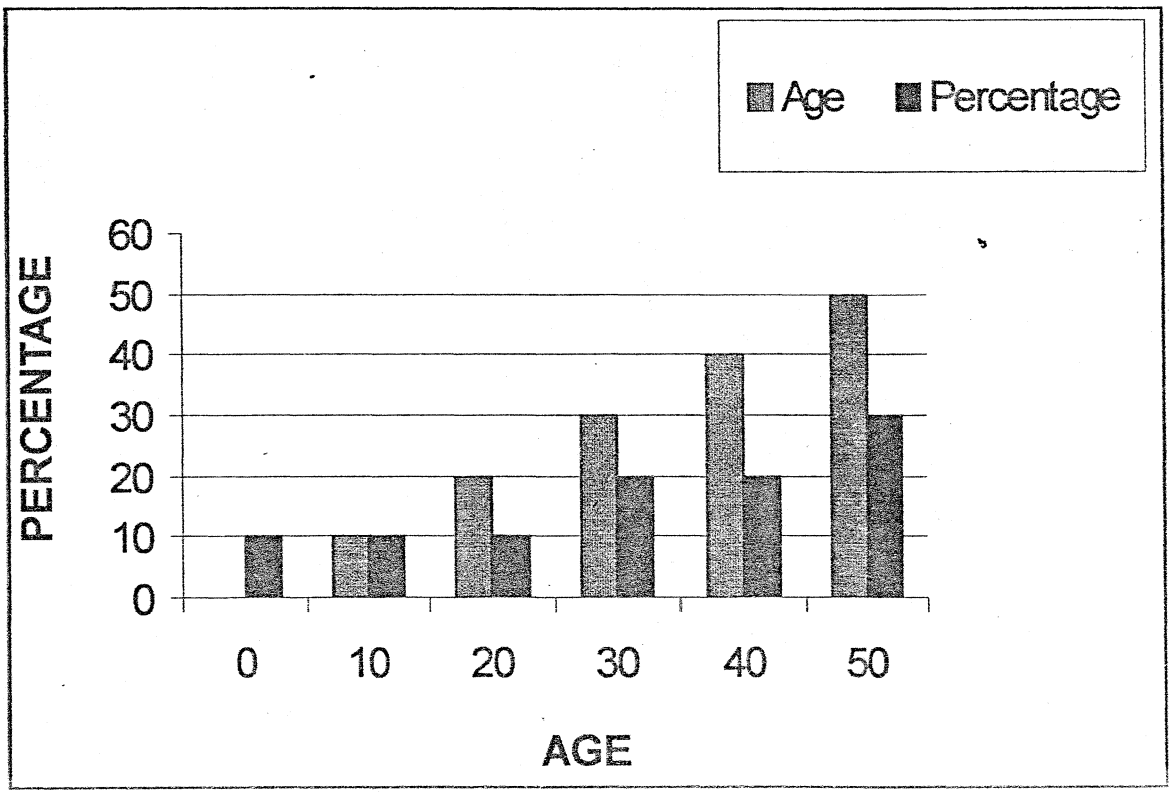
Distribution on Sex

Sex	No. of Patients	Percentage
M	4	40%
F	6	60%



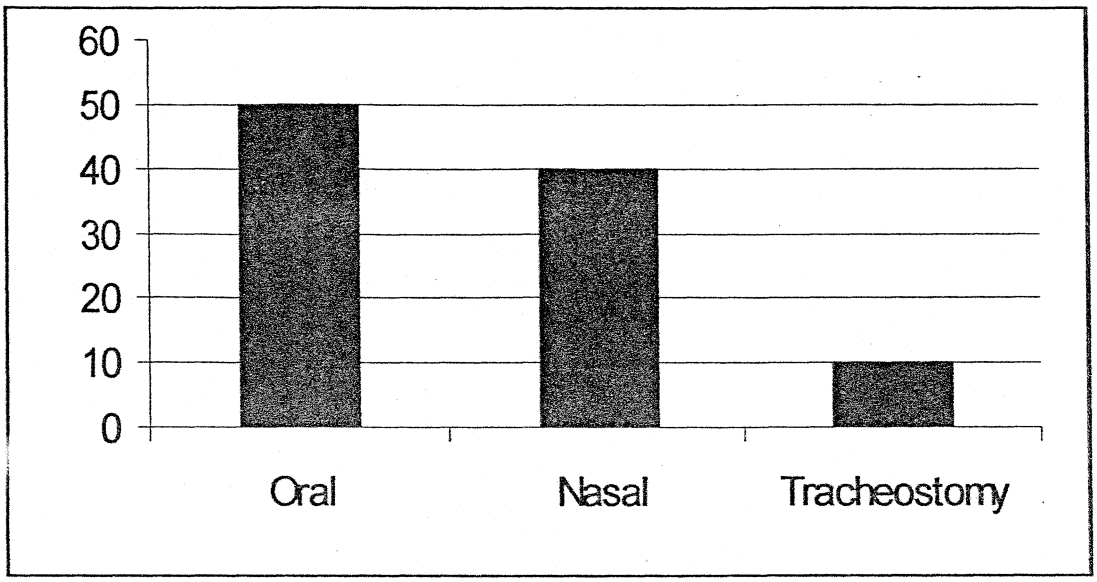
Age distributions

Age	Total Number	Percentage
0-9 Yrs	1	10%
10-19 Yrs	1	10%
20-29 Yrs.	1	10%
30-39 Yrs.	2	20%
40-49 Yrs.	2	20%
50-60 Yrs.	3	30%



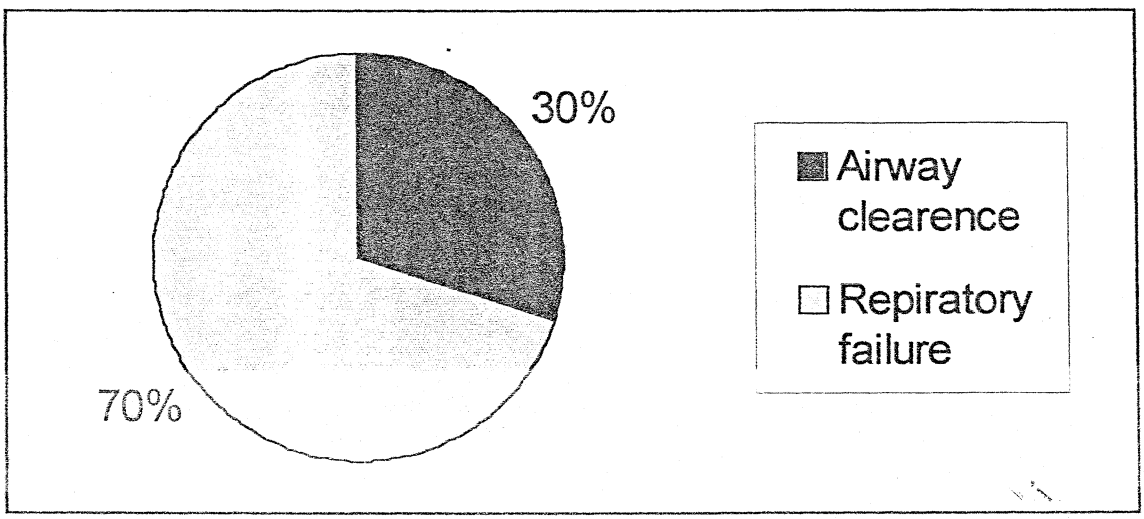
Data on the varies Risk factors on this part of analysis shows the risk factors VAP.

Data on type of intubation



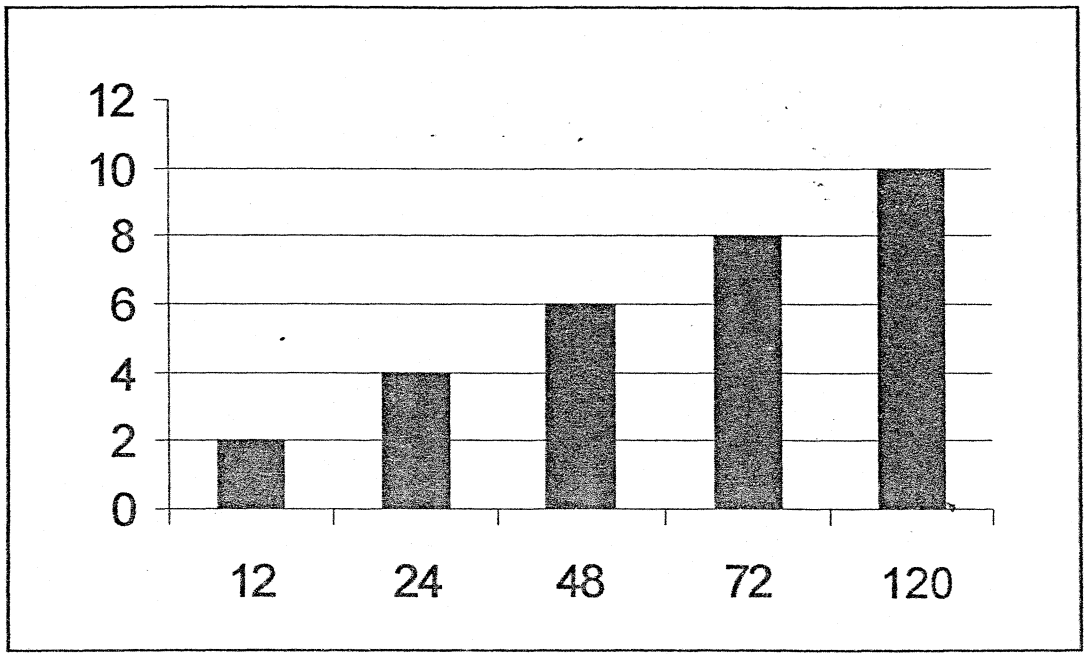
Data on Reason for intubation

Reaspn for intubation	Percentage
Airway clearence	30%
Repiratory failure	70%



Data on clinical pulmocary infection score (CPIS)

The CPIS was determined 3 times during the study within 24 hrs of intubation 48 to 71 hrs or 72 hrs-96 hrs of intubation. And on the data collected the VAP occurred after 48 hrs of intubation. The score was 9 and 12 each variable was assigned points (0,1,2) and a total CPIS (range 0-12) was obtained.



SUMMARY

The chapter dealt with analysis and interpretation of data collct from ventilated patients. Descriptive statistics was used for the analysis. Bar diagrams and pie diagrams were used to describe the contributing factors of the ventilator associated Pneumonia in samples.

CHAPTER - V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter given a brief account of the present study including conclusions drawn from the findings and possible applications of the result. Recommendations for future research and suggestions for improving the present study are also presented.

SUMMARY

This study was undertaken to identify the factors contributing to ventilator associated Pneumonia in mechanically ventilated patients in Neuro medical ICU in SCTIMST, Trivandrum.

The Specific Objectives of the Study are:-

1) To analyze the incidence of ventilator associated Pneumonia in Neuro Medical ICU.
2) To identify the relationship of ventilator associated Pneumonia and selected variables.
3) To observe the respiratory care provided by the nursing personnel to ventilated patients.

Need of the study was the careful attention to the known risk factors leads to as appreciable reduction in long term morbidity and mortality rate. Controlling the modifiable risk factors is one of the method for preventing VAP.

The review of literature helped the investigator in understanding the risk factors determing methodology and developing the tool and prepare pamphlet on risk factor modification.

A structured observation chart was developed content validity was determined and pilot testing was done.

The study was conducted in Sree Chitra Thirunal Institute of Medical Science and Technology at Neuro Medical ICU, Trivandrum, Kerala in September 2005.

The sample comprised of 10 ventilated patients in NMICU. The data obtained were analyzed by using descriptive statistics. Both Bar and Pie diagrams were utilized to represent the distribution of Risk factors on basis of scores obtained from the CPIS score and the specific content areas. Reason for intubation. Type of intubation, Age, Diagnosis.

The Major Findings of the Study

- ➔ The ventilated patients above the 50Yrs developed VAP.
- ➔ The VAP developed after 72 hrs of intubation.
- ➔ The Nasally intubated patients are more prove to develop VAP.
- ➔ The underlying disease condition also interfere with development of VAP.

Limitations

The limitation of the study are:-

- ☞ The tool has been developed by the investigator as no standarlized tool was available.
- ☞ The study was limited to Neuro Medical ICU in SCTIMST, Trivandrum.

CONCLUSION

Based on the findings of the study, the following conclusions were drawn.

- ➔ Nasally intubated patients (40 %) are more prone to development of VAP.
- ➔ The underlying disease condition will also contribute to development of VAP.
- ➔ Age more than 50Yrs (30 %) are more prone to develop ventilator associated Pneumonia.

RECOMMENDATIONS

The following recommendations are made as basis of present study.

1. A similar study can be conducted in other health care Institutions.
2. A study can be done to find out the relationship of various risk factors on VAP.

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APPENDICES

A tool for obtaining information on the contributing factors of ventilator associated Pneumonia on patients on Mechanical Ventilation.

OBSERVATIONAL CHART

Name :

Age :

Sex :

DIAGNOSIS :-

REASON FOR INTUBATION

ROUTE FOR INTUBATION

DATE & TIME OF INTUBTION

Scores (0,1,2)	TIME OF OBSERVATION Within 24hr of Intubation	Within 48hrs	Within 72 hrs	CPIS Sc Score
Elevation of Body temperature (>38^0 C)				
Leukocytosis (> 10,000)				
Number of tracheal suctions (>3)				