Risk factors favoring pneumonia...
INTRODUCTION

It is known that the Intensive Care Units (ICUs) emerged as a response to the treatment of severe users, constituting hospital areas destined to critical users who require highly complex care, as well as strict control.  

It is identified that, in Brazil, ICUs began in the 1970s, enabling the mission of providing excellence care, aiming at the recovery of the severe patient by constant monitoring, using adequate operational resources, generating and disseminating knowledge through scientific research and always maintaining a holistic view.  

It is emphasized that nurses have an important role in mechanical ventilatory assistance, since it is they who plan, conduct and supervise the care provided to the patient who needs this support.  

It is observed that some precautions are essential to reduce the adverse effects of mechanical ventilator installation and maintenance, such as: monitoring ventilatory parameters; controlling the general conditions of the patient; maintain humidification of the heating of inhaled gases under appropriate conditions, in addition to the mobilization and withdrawal of secretions when necessary.  

A degree of experience is required in planning ventilatory care and it should be administered by persons with appropriate training and with proven ability.  

It is shown that the vast majority of critically ill patients hospitalized in an intensive care unit (ICU) need mechanical ventilation (MV). It is reported that during this period, the patient undergoes a process of mechanical ventilation transition. It is shown that mechanical ventilation totally or partially replaces spontaneous ventilation and is indicated for acute or chronic acute respiratory failure.

The improvement of gas exchange and the reduction of respiratory work is favored by mechanical ventilation, and can be used non-invasively, through an external interface, usually a face mask, and in an invasive way, by means of a tube endotracheal tube or tracheostomy cannula.  

Mechanical ventilation is constituted in a supportive method for the treatment of patients with acute or chronic respiratory insufficiency with objectives, besides maintaining the gas exchanges, to alleviate the work of the respiratory muscles which, in acute situations of high demand metabolic, is high; reverse or prevent respiratory muscle fatigue; reduce oxygen consumption by reducing respiratory discomfort and allowing the application of specific therapies.  

Nursing diagnoses (ND), once inserted in care, are allowed a unique language, since they make it possible to understand and facilitate decision-making regarding the necessary interventions for each patient, thus improving the quality of care provided.  

The method is divided into two groups: invasive mechanical ventilation and noninvasive ventilation. It is shown that, in both situations, artificial ventilation is achieved with the application of positive airway pressure.  

The two methods are differentiated by the form of pressure release: whereas in invasive ventilation a prosthesis introduced into the airway is used, that is, a oro or nasotracheal tube (less common) or a tracheostomy cannula, in non-invasive ventilation used a mask as the interface between the patient and the artificial ventilator. It is noticed that, in patients submitted to prolonged ventilatory support, it is important to measure their muscular strength, respiratory drive and chest mechanics conditions for appropriate weaning of these cases.  

Mechanical ventilation is indicated in the following cases: in Acute Respiratory Insufficiency - ARI secondary to heart failure, pneumonia, sepsis and asthma; exacerbations of chronic respiratory failure secondary to surgical complications and trauma; acute lung injury and Acute Respiratory Distress Syndrome; cardiorespiratory resuscitation; neuromuscular diseases and intraoperative ventilatory support.  

Acute respiratory insufficiency is commonly observed in this group of patients, being caused by infections, primary pulmonary disease or even cardiogenic pulmonary edema after 16 chemotherapies. It should be noted that some studies with adults and pediatric patients have reported an unsatisfactory outcome and a very high mortality rate in immunosuppressed patients requiring mechanical ventilation.  

The indications are varied according to the objectives to be achieved, ie in emergency situations, especially when life risk does not allow a good evaluation of respiratory function, clinical impression is the most important point in the indication of assisted MV by some laboratory parameters.  

Ventilatory assistance can be understood as maintaining patients’ oxygenation and/or ventilation artificially until they are able to...
reassumed. This care is important for patients undergoing general anesthesia and for those hospitalized in intensive care units with respiratory insufficiency.

Nursing interventions are referred to any care, based on the judgment and clinical knowledge of the nurse, based on a scientifically based action, performed and planned for the benefit of the patient and in response to a Nursing diagnosis. It is noted that the Nursing Interventions Classification (NIC) contains interventions and activities performed by nurses in an orderly and structured manner. It should be noted that each nursing diagnosis is related to several interventions, being divided into priority, suggested and additional optional. It is reported that the priorities relate well to the cause of the diagnosis and have more activities and interventions likely to solve the problem.

It is verified that Nursing care for a patient in MV requires technical and interpersonal competence. It is reported that the nurse needs to perceive the changes in the health status of the patients, to interpret and intervene correctly using the Nursing process.

It is explained that pneumonia is an inflammation that arises in the pulmonary parenchyma affecting not only the lung tissue but also the respiratory bronchioles, alveoli and interstices, which are full of inflammatory exudates, leading to a reduction in gas exchange. It is described that this inflammation occurs when a microorganism or infectious agent, such as bacteria, viruses, fungi, protozoa, immunomodulating agents, among others, reach the pulmonary parenchyma causing this inflammation of the lung tissue.

It should be pointed out that pneumonia associated with mechanical ventilation (VAP) occurs in approximately 25% of patients in ventilatory assistance caused by multiresistant (MR) bacteria, which constitute a challenge in clinical practice and in the care of critically ill patients in Brazil, Latin America and all around the world.

Mechanically ventilated (MV) is known to be strongly associated with the development of nosocomial pneumonia. It is shown that pneumonia is an inflammatory response due to penetration and uncontrolled multiplication of microorganisms in the lower respiratory tract.

The risk factors for the development of VAPs are classified as modifiable and non-modifiable. It is determined that the non-modifiable are: age, severity score at ICU admission, and presence of comorbidities. It should be noted that the modifiable factors are related to the microbiota of the ICU itself, justifying the importance of knowing the most frequent agents in each specific place. It is revealed that knowledge of the local microbiota improves the prescription of antimicrobials, which should be done as soon as there is suspicion of VAP.

However, the pathogenesis in question is conceptualized as avoidable because it is related to "the use of invasive equipment and/or specific procedures, presenting, at its origin, some possibly alterable event".

It is complemented that the VAP is generally of aspirative origin, the main source being the secretions of the upper pathways followed by the exogenous inoculation of contaminated material or the reflux of the gastrointestinal tract. These aspirations are generally shown to be silent microaspirations, rarely with macroaspirations that, when they do occur, present severe and rapidly progressive respiratory insufficiency.

This ventilatory support is complemented by ventilator-associated pneumonia (VAP), being the main cause of death due to hospital infection. It is considered that among the factors that trigger this infection is oropharyngeal colonization, which can be minimized through preventive care.

A high volume, intensity and complexity of care is required in the care environment for critical patients, aiming at the early definition of clinical disorders and technology, requiring the constant updating of the Nursing corps which, when printing its technology, requiring the constant updating of the Nursing corps which, when printing its technology, requires different knowledge and skills.

Variables are related to patient care in invasive ventilatory support constituting the main focus of the research and having been extensively explored. It is noted. In this sense, that the care that stood out the most was the strict monitoring of water balance and respiratory rate, as well as the hygiene of the hands before the development of procedures to the user, besides the change of decubitus.

The interaction between the pathogen, the host and the epidemiological variables that facilitate this dynamics is involved in the pathogenesis of health care-related pneumonia. It is emphasized that several mechanisms contribute to the occurrence of these infections, but the role of each of these factors remains controversial, and may vary...
Risk factors favoring pneumonia...main factors of ventilator-associated pneumonia; articles published in English and Portuguese in the period between 2005 and 2017.

The articles in Portuguese resulted in 5,330 studies. Those who were not in full and still chose the full texts were excluded, from which were selected the articles that were in the proposed period, adding 500, refined by the subject, that is, pneumonia associated with mechanical ventilation, there are 234 articles. It is reported that, with the exclusion of the oldest articles, only 27 articles remained, of which 20 were analyzed with six different variables.

Articles containing foreign languages were excluded or other features not applicable to this analysis were included. The following controlled descriptors were used in the article search: Mechanical Ventilation; Associated pneumonia; Intensive care; Prevention.

In a second moment, a summary of the bibliographic material obtained, with an exploratory character, was carried out in order to verify the interest in the research. It is reported that the sample consisted of 20 articles that were submitted to selective reading to select the materials that really interested the research with an analytical reading to order the information present in the sources and, finally, the interpretive reading, more complex, to relate what is said by the author with the subject in question.

Primary variables: Sex; Age; Prevention; Stage of disease; Environment; Professionals.
Secondary variables: Procedures performed; Recurrence; Diagnosis; Hygiene.

It is stated that, in general, the research was finished with 20 scientific articles, whose objectives coincided with the objectives of this research, having as main subject the risk factors of pneumonia associated with MV. It is emphasized that this evidence was not defined as inclusion criterion, but as a random finding.

It should be noted that the year 2011 presented a more expressive number of productions than the other years. Studies with emphasis on the importance of preventive measures in the ICUs for the control of VAP,
decision making for the control and prevention of the disease, and the reduction of the occurrence of diseases are observed.

It should be emphasized that, in terms of objectives, all articles adequately met those of this study and were presented in a way that facilitated understanding. It was verified among the sample of articles analyzed, that all discriminated the method used. An overview of the analyzed articles is presented in Figure 1.
Mechanically ventilated pneumonia (VAP) is studied as a serious problem. It is noted that the one of the most feared adverse effects in the relevance of rapid and accurate multiprofessional team that works the intensive care setting. It is noted that diagnoses for the identification of VAP wasin the ICU has knowledge to avoid in order to apply some therapeutic, and it could avoid the future proliferation of bacteria that intervention, the first step is the complications. It is understood that there are few studies evaluating the epidemiology of VAP in Brazil.

It is emphasized that there is a considerable discrepancy in the results of epidemiological studies. It is reported that there is a need for studies about the pathways related to the pathogenesis of VAP, in order to provide new knowledge for the prevention of VAP. It is considered that the prevention of VAP only has benefits for the hospital and, above all, for the patient, so that the treatment of this pathology, besides having a high cost, patient recovery.

It is reported that there is a need to work together to reduce the risk factors that cause this disease. It is noted that the occurrence of VAP in patients with and without VAP, others demonstrate similar survival between these groups. It is reported that there is a need for studies about the pathways related to the pathogenesis of VAP, in order to provide new knowledge for the prevention of VAP.

It is considered that the prevention of VAP should be outlined with the adoption of preventive interventions. A series of measures are needed that can maximize the prevention of VAP only has benefits for the hospital and, above all, for the patient, so that the treatment of this pathology, besides having a high cost, patient recovery.

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<th>5</th>
<th>Intervention and proposed activities for the diagnosis of impaired spontaneous ventilation</th>
<th>Santos, Figueiredo(^*) 2010</th>
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<td>It is demonstrated that pneumonia is associated with mechanical ventilation infections that affect patients dependent on caused by bacteria. Thus, the main cause of death due to nosocomial pneumonia is possible patient affected by it becomes infected. It is reported that it is necessary preventable since there is an enormous need more susceptible to other to have a detailed care of the health care decrease the facilities of external infections and the care with professional where prevention is a decisive intervention.</td>
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<th>Pneumonia associated with mechanical ventilation: Esquivel, Silva, 2011</th>
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<td>It is defined that the knowledge of risk is verified, according to the propit is understood that, there are factors for VAP is of fundamental importance for decision-making in the mechanical ventilation, the great importance significantly to the contagion of the disease. It is shown that the risk factors of VAP are: age above 70 years; consciousness; tracheal intubation and reintubation; immune conditions; use of immunosuppressive drugs; prolonged mechanical ventilation longer than seven days; condensate aspirated from the fan circuits; nutriment; exogenous contamination; antibiotic therapy as prophylaxis; microbial colonization.</td>
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<th>Mechanical ventilation: how to start</th>
<th>Machado, Cynthia, Sérgio 2011</th>
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<td>It is noted that the use of invasive ventilation was verified that the necessity of ventilation should be noted that, according mechanical ventilation and non-invasive for nurses for the observation of the possibility of the patient's clinical picture, it is revealed that in both need to change the method of mechanical ventilation. It is critical in the exchange situations, artificial ventilation is achieved ventilation.</td>
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<th>8</th>
<th>Mechanical ventilation pneumonia: preventive measures</th>
<th>Cruz, Meneses, Serra, Barbosa 2011</th>
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<td>It is emphasized that the risk factors in the clinical picture can be there to reduce VAP due to the consequences for the host. Three categories: related to the host, the reduced by 50% or more using various techniques for the reduction.</td>
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measures devices and the team. Host factors are interventions to prevent colonization and patient. It has been shown that reported to include preexisting conditions as aspiration of secretions and gastric contents. Preventive measures considered as such as immunosuppression, chronic is pointed out that prevention should be simple and adequate within the obstructive pulmonary disease, acute part of VAP management strategies. Respiratory syndrome, level of consciousness, number of intubations, and medications in use. It is noted that device-related risk factors include the endotracheal tube, the ventilator circuit, and the presence of a nasogastric tube. Incorrect hand washing, resulting in cross-contamination of patients, is reported to be the major risk factor related to the team.

9 Pneumonia associated with mechanical ventilation: Silva, Silvestre, 2011

It is shown that risk factors for their should be emphasized that preventative is noticed that, among the development of VAP, can be divided into factor that involves constant hand possible contamination of contamination of modifiable and non-modifiable. Non-hygiene, maintenance of the patient's the pneumonia associated with modifiable variables are: age, severity elevated decubitus, care in the mechanical ventilation, the score at ICU admission, and presence of administration of the enteral diet and contamination of the place is an comorbidities. It is emphasized that inadequate techniques of aspiration and alarming factor so that the health professional needs to redouble the hygiene of the patient, as well as the place where it is found.

10 Pneumonia associated with Mataruna, 2011

It is determined that pneumonia often is reported that hand washing is widely recognized as a fundamental preventative measure in materials containing microorganisms or is measure. It is noted that it’s practice related to VAP, among others, are consequent to bacteremias originating from transmission of bacteria from the washing of the hands and the foci distant from infection. It is be patient to patient and is especially effective hygiene of the materials used in noted that intravascular catheters, urinary mucous membranes, respiratory the patient, infections and bacterial translocation can be secretions or objects that have come in produce bacteremias and pneumonias. It is contact with respiratory secretions.

11 Pneumonia associated with Sousa, Rêgo, Sousa, 2012

It is known that health-care related pneumonia is usually of private origin, of pneumonia associated with mechanical the ICU is easily affected by where the main source is secretions from ventilation, it was identified that, in additional ventilator-associated pneumonia, the upper Airways followed by exogenous internal factors, external factors, Among the most relevant factors inoculation of contaminated material. It is especially contaminated material, contribute to the infected or poorly sanitized stated that these aspirations are generally considerably to the aggravation of this materials. It is shown that, in this
Risk factors favoring pneumonia

12 Recommendations! Barbas, Ísola, 2013
Brazilian mechanical ventilation companies 2013

It is reported that, with the advent of increasingly sophisticated ventilators and analyzes made, it is of paramount importance monitoring of the patient in the ways of fine-tuning sensitivity and of several triggering mechanisms of different velocities and inspiratory flow adjustments in the device used. Several inspiratory timeout mechanisms and several monitoring options, there is the possibility of adjusting the patient's synchrony with the mechanical ventilator and mechanical ventilation according to the respiratory disease presented by the patients.

13 Pneumonia associated with Nascimento, Farias, 2014
use of invasive procedures Mantovani, Kalinke

It is noteworthy that some factors may contribute to the contamination of patients with mechanical ventilation and they are three times more likely to acquire pneumonia. It is said that the ICU's hospitalization and poor oral hygiene increase the susceptibility. It is defined that the chewing of hard foods, movement of the tongue and speech perform a process of natural cleaning of the mouth. It is confirmed that the use of some drugs reduces the salivary flow and contributes to the increase of biofilm in the oral cavity contributing to oral colonization by respiratory pathogens.

14 Nursing care for the patient Melo, Teixeira, 2014
under mechanical ventilation Oliveira, Almeida, care unit

It should be pointed out that the significant number of pneumonias increase associated with mechanical ventilation is due to the patient's lack of care with the patient's oral hygiene. By respiratory pathogens, drugs reduces the salivary flow and contributes to the increase of biofilm in the oral cavity contributing to oral colonization by respiratory pathogens.
| 15 | Modifiable risk factors for *Pneumococcal*, ventilator-associated pneumonia in intensive care | 2014 | It is stated that the risk factors for VAP are related to the category of most and non-modifiable. It is emphasized that the occurrence of VAP are inherent to the ICU's own microbiota and to the four pathways associated with the pathogenesis of VAP: aspiration of oropharyngeal contents; contamination of respiratory equipment; transmission from one patient to another.

It is argued that an important source of infection from mechanical ventilation of pneumonia should be pointed out that the prevention is understood that pneumonia is the pathogen transference implementation of standard precautions, the ventilation can be avoided between patients through health care of the antimicrobial prescription protocols. Considerably by means of the professionals or pathogens that are and, mainly, the reduction of the maximum hygiene procedures performed by characteristic of the equipment used intime of intubation.

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It is reported that the measures of prevention of VAP can be divided into oropharyngeal colonization and were measures considered as pharmacological and non-pharmacological, performed as the use of antiseptic oral measures known but the latter were highlighted due to their hygiene. Among the products used, as non-pharmacological have the greater viability, effectiveness and chlorhexidine, an antimicrobial agent with desired effect and avoid broad spectrum of activity against gram-consequent complications of positive (including resistant) microorganisms infections caused mainly by the bacilli.

It is known that in addition to the measures considered as pharmacological, measures known as non-pharmacological have the desired effect and avoid consequent complications of infections caused mainly by the lack or lack of hygiene.

It is emphasized that VAP is a common infection in the ICU, but its diagnosis is necessary because it has a high diagnosis of a VAP is of remains challenging. It is known that the sensitivity, but low specificity, since the fundamental importance for the diagnosis is made when the patient fever may be caused by a drug reaction or patient so that once diagnosed develops a new pulmonary infiltrate at the other extrapulmonary infection, and with this infection treatment is imaging examination accompanied by the pulmonary infiltrates may be due to initiated immediately so that there presence of fever, leukocytosis and purulent tracheal secretion.

It is reported that criteria to diagnose VAP is reported that the early diagnosis of a VAP is of fundamental importance for the patient so that once diagnosed initiation of treatment is of no greater impairment of the patient's health. Microbiological examinations, by collecting samples of material from the lower respiratory tract, by performing quantitative cultures in order to establish an accurate diagnosis.

Figure 1. Characterization of the scientific production regarding the risk factors that favor ventilation-associated pneumonia. João Pessoa (PB), Brazil, 2018.
It is reported that the selected studies demonstrated a great diversity of pneumonia associated with mechanical ventilation: measures of control and prevention of pneumonia in the ICUs, but this was not the only topic addressed, other issues emerged, such as: origin, diagnostic forms, major sources of infection and classification of risk factors for VAP.

The following thematic categories emerged after the analysis of the publications: Relationship of risk factors in the development of VAP; Definition of preventive measures in the ICUs for the reduction of VAP.

It is evident that these subjects are of paramount importance for all health professionals who live daily with patients who are in the ICUs, since it corroborates the reflection regarding the care to be taken to reduce the occurrence of this pathology.

It is pointed out that the occurrence of hospital infection depends basically on the existence of a source of pathogens, the transmission of the agent and the susceptibility of the patient. It should be pointed out that, in order to prevent infections acquired in the hospital, this cycle should be interrupted by having, as support, the detailed attention of the health professional.

It is revealed that the main risk factors that trigger pneumonia associated with mechanical ventilation are divided into modifiable and non-modifiable, where the main modifiable factor is age and severity score and, on the other hand, a non-modifiable factor is the microbiota, therefore, in a hospital ICU, it is inevitable the emergence of these microorganisms. It is reported that both are constantly inserted in an ICU, and preventive measures are necessary to reduce them.

With this assumption, in his article, one of the main ways to contract pneumonia associated with mechanical ventilation is the use of some contaminated equipment, since the patient, in the ICU bed, using ventilation mechanics, is susceptible to several diseases, mainly infectious. It is emphasized that, in this way, the correct use of this equipment, as well as the cleaning thereof, can be a way to prevent infection through existing pathogens in the equipment.

It is reported that the knowledge of the indispensable risk factors of the patient's involvement due to pneumonia associated with mechanical ventilation by the health professional is an approach in order to demonstrate the importance of care, above all, avoiding the possible causes of complication. It is necessary then that the health professional carries out the necessary precautions for the reduction of risks for the affection of this pathology.

In this sense, one of the most relevant risk factors for pneumonia associated with mechanical ventilation is through infections transmitted by the health care provider, and especially by pathogens in some of the equipment that the patient uses. a direct contamination.

It is exposed, through his research, that the lack of care of the nurse related to the hygiene of the patient is considered a more present risk factor in the ICUs of the hospitals, since the hygiene becomes indispensable in the recovery of the patient who makes use of the mechanical ventilator and is affected by pneumonia associated with mechanical ventilation, since hygiene, in addition to preventing diseases, can aid in patient evolution.

However, the health professional's perception about the preventive care of ventilator-associated pneumonia is important. Considering the main risk factors for ventilator-associated pneumonia mentioned above, special attention should be paid in the prevention of them, especially in the hygiene of the patient and the bed, since the patient who uses mechanical ventilation is predisposed to several pathologies that can be avoided, mainly, by means of an intensified hygiene.

It is summarized, according to the authors mentioned above, that the main risk factors that cause ventilator-associated pneumonia are: age; the severity score; the pathogens found in the equipment used by the patient; the lack of hygiene care and the transmission of infection through the health professional. The reduction of these factors is observed through preventive measures.

The results of this study are expected to provide support for discussions and new investigations focused on the main factors favoring the emergence of Mechanical Ventilation-Associated Pneumonia.

It is understood that mechanical ventilation is an increasing procedure in the ICU, in contrast, the increase of pathologies caused due to the use of the mechanical...
Mechanical Ventilation-Associated Pneumonia (VAP).

In view of this significant increase, the main risk factors that favor the emergence of this pathology were addressed. It is reported that the chosen articles clearly and objectively describe these factors, addressing the main preventive actions, especially the intensification of patient hygiene, since it was understood that many infections arise from the lack of care with the hygiene of the patient.

It is inferred that, despite the importance of the care given to patients on mechanical ventilation, many health professionals do not perform them correctly. Therefore, it was identified the need for specific care for the treatment of this pathology in order to obtain a gradual improvement of the patient.

It is important, in addition to applied care, to educate Nursing teams in the proper handling of the mechanical ventilator or any other equipment present in the intensive environment, so that they are factors that interfere in the prognosis.

It is described, in an article, that a professional can transmit external infections to the patient in the ICU, since the health of the patient is very debilitated.

However, it is noted that pneumonia associated with mechanical ventilation, although it is an infection that can be avoided by nursing care, few nurses carry out preventive measures. It is reported that the index of this pathology is increasing, mainly due to the lack of specific care for the patient.

It is concluded that, among the main risk factors for pneumonia associated with mechanical ventilation, the most relevant is the inefficient practice or even the lack of hygiene of the patient performed by the health team, considering the existence of innumerable opportunistic pathogens that could easily be eliminated through efficient hygiene.

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