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## ORIGINAL ARTICLE

### QUALITY INDICATORS IN VENTILATORY ASSISTANCE IN A UNIVERSITY HOSPITAL: DO KNOW IN NURSING

#### INDICADORES DE QUALIDADE NA ASSISTÊNCIA VENTILATÓRIA EM UM HOSPITAL UNIVERSITÁRIO: SABER FAZER NA ENFERMAGEM

#### INDICADORES DE CALIDAD EN LA ASISTENCIA VENTILATORIA EN UN HOSPITAL UNIVERSITARIO: SABER HACER EN ENFERMERÍA

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#### ABSTRACT

**Objective:** understanding the quality indicators of ventilatory support at the neonatal intensive care unit of a university hospital related to TOT, nasal CPAP, Oxy-Hood. **Method:** a non-experimental descriptive study with a quantitative approach conducted with 20 nurses in the NICU of a university hospital, through a questionnaire survey about the protocol of ventilatory support: TOT, nasal CPAP and Oxy-Hood. A statistical processing was performed, where the data were grouped and processed in Microsoft Office-Excel Program and presented in figures. The research project was approved by the Research Ethics Committee, Protocol 01660412.9.0000.5243. **Results:** the use of protection of the nasal septum, without injury, with normal standard of saturation of CPAP and TOT, beyond the grounds for withdrawal of funds. **Conclusion:** a review of the practice and use of technology is necessary to inhibit complications and errors in the interests of patient safety. **Descriptors:** Intensive Care Units; Patient Safety; Nursing Care; Nursing.

#### RESUMO

**Objetivo:** compreender os indicadores de qualidade da assistência ventilatória na unidade de terapia intensiva neonatal de um hospital universitário, relacionados ao TOT, CPAP nasal, Oxy-Hood. **Método:** estudo descritivo não experimental, com abordagem quantitativa, realizado com 20 enfermeiros na UTI Neonatal de um Hospital Universitário, por intermédio de um questionário sistematizado sobre o protocolo da assistência ventilatória: TOT, CPAP nasal e Oxy-Hood. Foi realizado tratamento estatístico, onde os dados foram agrupados e processados no Programa Microsoft Office - Excel e apresentados em figuras. O projeto de pesquisa obteve a aprovação do Comitê de Ética em Pesquisa, Protocolo nº 01660412.9.0000.5243. **Resultados:** a utilização de proteção do septo nasal, sem lesão, com padrão normal de saturação do CPAP e TOT, além dos motivos de retirada dos recursos. **Conclusão:** é necessária a revisão da prática e da utilização de tecnologias para inibir complicações e erros em prol da segurança do paciente. **Descritores:** Unidades de Terapia Intensiva; Segurança do Paciente; Cuidados de Enfermagem; Enfermagem.

#### RESUMEN

**Objetivo:** comprender los indicadores de la calidad de la asistencia ventilatoria en la unidad de cuidados intensivos neonatales de un hospital universitario relacionado con TOT, nasal CPAP, Oxy-Hood. **Método:** es un estudio descriptivo no experimental, con un enfoque cuantitativo realizado con 20 enfermeros en la UCIN de un hospital universitario, a través de un cuestionario sistemático sobre el protocolo de soporte ventilatorio: TOT, CPAP nasal y Oxy-Hood. Se realizó un tratamiento estadístico, donde los datos fueron agrupados y procesados en el programa de Microsoft Office Excel y presentados en figuras. El proyecto de investigación ha obtenido la aprobación del Comité de Ética en la Investigación, protocolo 01660412.9.0000.5243. **Resultados:** el uso de la protección del tabique nasal, sin lesión, con patrón normal de saturación de CPAP y TOT, además de los motivos para la retirada de los recursos. **Conclusión:** una revisión de la práctica y el uso de la tecnología es necesaria para inhibir las complicaciones y errores en los intereses de seguridad de los pacientes. **Descriptores:** Unidades de Cuidados Intensivos; La Seguridad del Paciente; Cuidados de Enfermería; Enfermería.

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INTRODUCTION

Among the various procedures that are performed in the Neonatal Intensive Care Unit, as highlighted ventilatory assistance, which include technologies that contribute to reducing neonatal mortality, and promoting the fourth Millennium Development Goal of the United Nations (UN) to reduce mortality, and with the focus on quality of child health care. However, health professionals, especially nursing should be trained in neonatal ventilatory assistance in order to collaborate with the quality of service, because the nursing care of newborns in the Neonatal Intensive Care Unit has been evident in recent studies, configure basic interventions for health recovery and well-being of neonates.<sup>1</sup>

The assistance to be provided to the neonate search through the care offered eliminates hazards in their development ensuring survival with quality, besides the recovery of the various systems affected by prematurity, the creation and maintenance of family ties and cure of disease.<sup>2</sup>

The guiding challenge for practice is the sense of caring, it detonates a need beyond the maintenance of life, because it allows the creation and strengthening of family ties and the health care team. The practice of care imposed upon the need to examine the practice of health professionals looking for a care quality.<sup>3</sup> Thus, the quality of care is being discussed among health care professionals and many challenges are derived in order to meet the demands efficiently and effectively in pursuit of an audience of excellent quality.

Quality is a set of attributes that includes the level of professional excellence, efficient use of resources, minimal risk and high degree of user satisfaction, considering essentially the existing social values. The pursuit of quality in the health service has been developed in programs such as hospital accreditation, ISO certification, integrated management system in hospital organization, medical record audits, accounting, risk, among others.<sup>4</sup>

The neonatal nurse plays a role of paramount importance, since coordinate assistance and remains with the newborn for 24 hours. In addition to reporting the observations recorded by the newborn and relates directly to the family, parents and grandparents. All these activities require professional nursing a scientific technical knowledge, and balance for interventions in

work processes and quality care with minimal aggravation.

Among the various care provided by nurses in a neonatal ICU is ventilatory assistance, aimed at improvement of the condition of the newborn, because due to the immaturity of the respiratory system it needs a support to maintain adequate oxygenation. After birth, the newborn must make a number of adaptations to extrauterine life, including morphophysiological and biochemical maturation of the lung parenchyma. Newborn infants, particularly preterm infants, do not have adequate pulmonary function, and in most cases, require the use of oxygen after birth. The ventilatory assistance is to provide therapeutic adequate tissue oxygenation and that will ensure gas exchange, improving alveolar ventilation, reducing the work of breathing and re-expanding atelectasis areas.<sup>5</sup>

In the course of this job will be evaluated the quality indicators of the installation and maintenance of: TOT (orotracheal Tube), nasal CPAP (Continuous Positive Airway Pressure) and Oxy-Hood. Indicators of quality of nursing care in a neonatal unit are those related to the application of knowledge and technology, in the development of techniques in the care that result in minimization or elimination of changes in newborns admitted to the unit. And that result in minimal or no sequel in the future; ensuring not only the survival, but survival with quality.

Indicators are another contribution to healthcare institutions that care about improving their performance with customers. Administer quality refers to the commitment to providing a good product or service to customers or users. In the case of a health service, the ideal would be to offer assistance that the desired effect, conformed to the expectations of users, providers of technical assistance, the service managers, financiers and even the suppliers of materials and equipment, enter other privileged actors.<sup>6</sup>

OBJECTIVES

- Understand the quality indicators of ventilatory support in the neonatal intensive care unit of a university hospital related to TOT, nasal CPAP, Oxy-Hood.

METHOD

This is a descriptive non-experimental study with a quantitative approach, in order to analyze the quality indicators in nursing given to newborns in the Neonatal Intensive Care Unit, University Hospital Antonio Pedro (HUAP), linked to the Federal Fluminense University, State of Rio de Janeiro, Brazil.

The studied population consisted of 20 nurses from the neonatal ICU of the University Hospital Antonio Pedro. All signed an informed consent form (ICF) conditioned on their participation, ensuring anonymity and confidentiality of information. The inclusion criteria took into consideration: 1) the Nurse of NICU; 2) Nurses who performed the work process; 3) Interest to participate in the study.

There were used the quality indicators and patient safety from the National Health

$$n = \frac{z^2 p \cdot q \cdot N}{d^2 (N - 1) + z^2 \cdot p \cdot q}$$

Figure1. Formula of discrete variable of finite population

It was used for the calculation of the sample a confidence level of 95%, and then the sampling error of 5%; the smaller the number of the population, the greater the number of the sample. The prevalence was 50% as a weighting factor, since it ensures the largest possible sample size. Considering that the total number is 105 facilities during the work processes of nursing in the neonatal unit, and that it was distributed by type of assistance, the minimum sample size is 95.

To collect data a systematized questionnaire was constructed with objective questions about the clinical protocol for the development of procedures for the nursing work, the mechanical ventilation: TOT, nasal CPAP and Oxy-Hood, during the period from December 2012 to April 2013.

The information was collected through the completion of the questionnaire by the nurse. Each neonate had its individual questionnaire. After the entry of each newborn who required ventilatory assistance for CPAP, TOT or Oxy-Hood, the filling in of questionnaires was conducted, these are incorporated into a database, and where they are organized according to the purpose of the research. Each questionnaire was only closed after discharge from the newborn or after it no longer requires ventilatory assistance.

Variables are defined by any events, situations, behaviors or individual characteristics those take at least two discriminative values. In other words are the aspects, characteristics or actual or potential measured through the values they assume and discriminate an object of study factors.

The variables included during the data collection were the type of assistance given (CPAP, TOT, OXY-HOOD), monitoring of oxygen saturation, whether it was inside or outside the established patterns of saturation (86-93%), protection septum, septum injury,

Surveillance Agency (ANVISA - 2013) were used as the type of care used, monitoring of SpO<sub>2</sub>, the presence of protective nasal septum, the presence of hyperemia of the nasal septum, and the reasons for withdrawal, to assess the quality of ventilation achieved during care, run by nurses in nursing work processes in the Neonatal Unit of the University Hospital Antonio Pedro/UFF. To calculate the required sample size formula was used for discrete variables finite population, as follows figure 1 below:

reasons for withdrawal. All factors considered critical to quality care.

To analyze the data a daily survey was conducted in the book statistics of NICU/HUAP with a total of 76 hospitalizations during the pre-set period. Despite the number of 76 hospitalizations won't be this amount used, since the interest is the process of ventilatory assistance.

For statistical analysis, the data were grouped into a database and processed in Microsoft Office software - Excel/Windows, and presented in tables and organized by group of variables depending on the objectives of the study.

The quality was evaluated based on the adequacy of practice within safety standards, according to international quality protocols of the World Health Organization (WHO) for which assistance is appropriate, and quality is required to provide safety without events adverse, errors and failures.<sup>7</sup>

The investigation was carried out after the examination and approval of the Ethics Committee of the Faculty of Medicine HUAP/UFF, being approved under Protocol 01660412.9.0000.5243.

## RESULTS AND DISCUSSION

The 105 total installations of ventilation, sixty-two (62) are of the CPAP, the minimum sample of this assistance was 54, and the number of installation TOT won 34, with a sample of 32, and Oxy-Hood had nine installations, with the same value of the sample; recalling that the smaller the number of my population, the greater will be the required sample. With a minimum sample for the reliability study, we obtain these values; however, the study took 100 % of the population, being the same a simple random.

The sample of this study was of 95 plants divided in the following categories: Oxy-Hood

nine; CPAP 62 and TOT 34. It is contemplated a total of 48 newborn which the number of premises vary with each case and each newborn. Since a newborn may require more than one type of ventilatory support. Thus, the number of completed questionnaires was 80, being nine (11%) of Oxy-Hood, 29 (36%) of TOT, and 42 (53%) of CPAP.

It is noteworthy that the residence time of the NB in the unit is extended, reducing the turnover of beds. Data analysis was performed based on the concept of security, according to ANVISA, and IOM of quality and effectiveness.<sup>2,8</sup>

Safety is to prevent injuries and damage in patients who carry the care that aims to help them, ie, corresponds to the minimum acceptable risk of unnecessary harm associated with health care. Safety is one of quality extensions. Quality and safety are inseparable attributes in its work<sup>8</sup>, it brings a quality care is one that produces the best health outcomes (between benefits and harms). This quality is given by a product of two factors: science and technology, and the application of these health practices. You could say that unsafe care adds a risk of harm to the patient expendable, making negative the results from the health care and effectiveness, is when the expected improvements in health conditions are indeed met, ie, occurs when care is based on scientific knowledge for the benefit of the patient.<sup>8</sup>

The assistance most used was with the CPAP, with fifty-nine (59%), in second TOT with 32 (32%), and Oxy-Hood was the least

used at the time of data collection with only nine (9%) of total number of installations.

Can relate these values with the fact of the neonatal intensive care unit cater mostly newborn preterm infants who require a more targeted oxygen delivery, since it does not possess the necessary maturation of the lungs and is being adapted to stage extra uterine.

The use of CPAP occurs on a larger scale than the TOT because it is less invasive and less harmful to the newborn. The choice for the TOT is only made when the CPAP is not meeting the needs of the newborn respiratory, or when it is born with difficulty in breathing and need oxygen administração that is more focused.

This positive pressure can be offered by different interfaces, and for the newborn is recommended to use the nasal prong. The physiological effects of CPAP are: increased transpulmonary pressure, increased capacity and functional residual volume, improved lung compliance, prevention of atelectasis, conservation of endogenous surfactant, stabilizing the airways, helps promote regularity of the respiratory rhythm, among others.<sup>9</sup>

Working with the reviews of the indicators of the number of facilities for each installation, a new ventilation is initiated, there was a total of ventilatory assistance in facilities that strikes us as in figure 2:

Assistance	Rn	Instalations	Average
CPAP	42	62	1,47
TOT	29	34	1,17
OXYHOOD	9	9	1

Figure 2. Average of ventilatory installations assistance.

The CPAP was assistance with more facilities, their average installation was 1,47 for each newborn. As the number of installations of 62 to 42 newborns. Reinstalling CPAP exposes the newborn, as the damage the integrity of the nasal septum, which can cause injuries septum, resulting in tissue necrosis. Besides exposing the newborn to concentrations of oxygen if not monitored , which can be detrimental, leading to adverse events such as hyperoxia and retinopathy of prematurity.

The use of CPAP on a larger scale , is justified because it is less invasive, and meet the need for oxygenation of the newborn, without performing a more invasive procedure such as TOT be necessary. However, the use of CPAP is associated with higher risk of

barotrauma, air leak syndromes, abdominal distension and facial injuries. It is noteworthy, therefore, the need for careful monitoring of newborns undergoing this type of technique.<sup>9</sup>

The average of TOT installations , was 1,17, taking into account the number of installations was 34, and the number of newborns was 29. This occurs because , when you leave the CPAP, which he sometimes is not meeting the need for a good saturation of the recent born, it is necessary to install the TOT. When there is improved by it, the TOT is taken to make weaning happens again with CPAP. But sometimes occurs not the appropriate response to this weaning, then it is necessary to return to TOT.

When installing the TOT in newborn, we are opening spaces for possible adverse



events, as is inserting a foreign body, and injuring the oral mucosa. In this sense, it shows how event: accidental extubation, which sometimes caused by the mismatch in the setting, and the obstruction of the tube. When talking about obstruction of all it is necessary to say about the importance of aspiration, in order to avoid such situations. Since it prevents the accumulation of secretions , which may compromise the oxygenation of newborn, sometimes having to be removed and reinstalled.

When talking about Oxy-Hood, its installations' number was nine in nine newborns, with an average of one Oxy-Hood installed. The Oxy Hood is used when the newborn is breathing-espotaneamente, and does not require high oxygen concentrations. Its use is low because in most newborns admitted to a neonatal intensive care unit, need a higher concentration to be offered.

CPAP (Continuous Positive Airway Pressure Air) is a simple resource applied

noninvasively. It is necessary to take certain precautions during ventilation with CPAP as the integrity of the nasal septum, saturation levels, and avoidable reasons for withdrawal.

This feature brings many benefits to the newborn requiring ventilatory support, however, CPAP, despite the benefits, it also has a number of disadvantages that should be considered dais which we can mention: pneumothorax secondary to alveolar distention, nasal obstruction accumulation of secretions, gastric distension by air leaking into the stomach, and the most common injury or even necrosis of the nasal septum due to malposition of the nasal device.<sup>10</sup>

We can see in Figure 3 the findings of the study, which found protection nasal septum newborn; injury of the nasal septum, the pattern of saturation of CPAP; beyond the reason for withdrawal of ventilatory feature.

Protection of nasal septum		
With protection	50	81%
Without protection	12	19%
Injury of nasal septum		
With injury	4	6%
Without injury	58	94%
Saturation pattern - CPAP		
Within the standard	36	58%
Nonstandard	26	42%
Reason for withdrawal of the CPAP		
Clinical worsening	14	23%
End of statement	44	72%
Withdrawal through injury	3	5%

Figure 3. Ventilatory assistance for CPAP.

The protection of the nasal septum is an indicator of quality, recommended by the National Agency of Sanitary and Ministry of Health in order to prevent complications such as damage to the nasal septum surveillance. Therefore you must always be aware of the appearance of the wings and the nasal septum for the presence of ischemia and necrosis.<sup>2</sup>

As Figure 3 shows, 81% of CPAP presented with protection nasal septum, being an indicator of quality, however, 19% did not have the protection of the nasal septum during nursing care. The protection of the nasal septum exists in order to avoid injury by the use of CPAP, where the prongs, is in direct contact with the nostrils of the newborn.

A care to avoid injury to the nasal septum is the prong does not touch the nasal septum and without excessive mobility, since friction can cause serious injuries, with disastrous

aesthetic consequences.<sup>2</sup> It is necessary to choose the size of the prongs had run so that there are no exhaust gases through the nostrils, in order to avoid injury use protection nasal septum is always indicated.

In addition to pay attention to the placement and method of attachment. Another caution in order to avoid and so there is injury prevention, it is necessary that occurs inspection of the mucosa of newborn continuously, being necessary to the removal of the prongs. It is important also to carry out rotational movements in the nostrils , so that there is stimulation of movement of this area.<sup>10</sup> As protection nasal septum may use transparent film dressing and/or hydrocolloid to protect the soft parts of the nose and septum.<sup>2</sup> Thus allows the insertion of a caution to avoid injury to the nasal septum.

It is necessary when using the CPAP to pay attention to some important factors, besides the integrity of the upper airway, such as heating and humidification and proper choice of the appropriate material. By leaving the protection of the nasal septum be used without assistance we are providing security to the newborn, since we are exposing the possible adverse events, which affect the quality of care. The lesion of nasal septum is considered an adverse event.

The National Patient Safety program, behind what it takes to prevent and reduce the incidence of adverse events related to health care in health services. For such events cause harm to patients and losses associated with health care, arising from processes or structures of care.<sup>7</sup> Due to the lack of use of protection nasal septum, as adverse effects have the occurrence of lesions in the nasal septum of the newborn. These lesions are six (6%) of all newborns who used CPAP. The stages of lesion formation of the nasal septum are: introduction of nasal artifact; ischemia of the nasal mucosa and epidermis; hyperemia of the nasal mucosa and epidermis, nasal edema with or without bleeding, and necrosis, which may cause deviated septum.<sup>10</sup>

This adverse effect occurs unfortunately only for identification of lesions occur mostly when the process is advanced, presenting nasal edema or necrosis. The U.S. Institute of Medicine says that one of the problems of quality in health services, is the underutilization, which refers to the lack of provision of health care when it could produce benefits for patients.<sup>7</sup> In this case the lack of use of protection nasal septum, and inadequate achievement with the nasal prongs, nasal septum cause injuries. Then, when that is not offered to newborn protection nasal septum, is refusing to even care. There are several factors that predispose to the development of secondary to the use of nasal CPAP nasal lesions, among them we can mention the gestational age, the continued use and aspects relating to the quality and suitability of the material as well as nursing care directed the newborn.

There are needs to be standardized the techniques for installing and maintaining the system as well as for the use of nasal prongs, with the special attention on the size and anatomical shape of it, and about the monitoring and positioning of the device by the nursing staff.

ANVISA notes that to have quality in health care is necessary that the patient has security, and this includes the absence of injury to health care that is supposed to be beneficial. Health insurance systems reduce

the risk of harm to patients. Thus, it is essential to the health of newborn assistance one quality, and that the health service is committed to the quality of assistance and the training of health professionals strat, intervening in the work process.<sup>7</sup>

However small the number of newborns with nasal septal injury, it is not acceptable at any level, since the patient becomes unsafe environment. This makes poor care, since security has been identified as a priority attribute on the issue of quality in health care. The World Health Organization says that the lack of security is unnecessary, actual or potential damages associated with health care.<sup>7</sup>

You can then understand that to be reduced to a minimum, or no risk of harm to the patient, is raising the level of quality of service. The data collected also direct the issue of the level of saturation of NB using CPAP. We know that the saturation levels should be kept between 86% to 93% to good oxygenation.<sup>2</sup>

Figure 3 shows a total of 42% of newborns who used CPAP, were outside the standards of saturation. In this case, all those newborns who were nonstandard, were saturating above 93%.

It is important to point out the importance of being dentro patterns of saturation because saturation is lower case, no adequate oxygenation and enter into newborn hypoxia ( $\text{SatO}_2 < 86\%$ ), if the saturation is higher than the recommended newborn enters hyperoxia ( $\text{SatO}_2 > 93\%$ ), bringing damage to many newborn as hyperventilation, and risk of retinopathy of prematurity.<sup>2,11-2</sup> From this perspective, we come to another category defined by the U.S. Institute of Medicine that includes quality problems in health services beyond the underutilization cited above, it is the misuse that you are referring to preventable problems associated to health care and are related to the field of patient safety.

At the moment when the saturation of the newborn lies outside of those recommended standards by the Ministry of Health, the technology that allows me the good oxygenation of the infant is being used incorrectly and can cause complications for newborns by saturation above standards. May lead them to serious sequelae. Thus, to justify such high levels of newborns saturating, is the lack of updating of professionals. Saturation levels were recently changed to 86 to 93%  $\text{SatO}_2$ .<sup>2,11-2</sup>

It is noticeable in this case the importance of continuing education, as it is one of the points that appear at every level in hospital

accreditation manual, and especially with regard to neonatal units. The updating of professionals is extremely important because it avoids problems such as this indicated during the course of data collection. Updated with professionals, there is a reduction of adverse events, providing care to newborn safely .

Thus, an unsafe care is expressed at increased risk of unnecessary harm to the patient and may cause negative results in relation to health care.<sup>8</sup> From the moment that saturation is not adequate, the patient is exposed to unnecessary risks, and avoidable, and the care provided in care outside of the standards established and expected quality, which is the best possible quality, 0% of adverse events and situations that lead me to such problems.

As stated previously, an unsafe care, lower quality of care, and flees the proposed standard for quality, the gold standard. Another important point to be seen is the reason for withdrawal, which was found during the collection, was removed for clinical worsening, with 23% by the end of the statement with 72%, and withdrawal through injury of 5%. These indicators, which seek the reasons for withdrawal, are preventable if given quality care and safety.

The CPAP aims to improve arterial oxygenation and decrease the work of breathing, allowing the reduction of oxygen consumption and conservation of spontaneous breathing.<sup>13</sup> However, if no improvement, is

the suspension of CPAP and begins mechanical ventilation, ie worsening of the clinical as a reason for withdrawal, does not necessarily indicate an adverse event or inadequate care, because it depends not only a matter of practicing professionals as well as the body's response to the proposal of newborn care.

At the end of the statement, ie, the improvement of the respiratory condition, the reason for withdrawal through injury indicates an adverse event, this event previously described when speaking of protection septum and septal lesions.

When removing a CPAP for injury, this can be exposing the newborn to a more invasive type of procedure. This type of circumstance is avoided with the correct use of protective septum, and the general care of the nasal prongs. The reason for withdrawal through injury is avoided using protection septum is used hydrolocoideous,<sup>2</sup> similar findings with another study,<sup>9</sup> where the use of hydrocolloid aims to protect the septum.

Although in percentage compared to the other grounds for withdrawal, be low to injury, this event is not accepted by the standards of safety and quality, since they are preventable and predictable, so it is necessary that there is a planning and structuring work process so that such an event will not occur.

Besides CPAP, we can see in Figure 4 the findings of the study, which found the default saturation of TOT; beyond reason for withdrawal of ventilatory feature.

Saturation standard - TOT		
Within the standard	19	56%
Nonstandard	15	44%
Reason for withdrawal of the TOT		
End of statement	26	76%
Accidental extubation	3	9%
Obstruction	1	3%
Obit	2	6%
Other	2	6%

Figure 4. Ventilatory assistance by TOT.

In TOT, indicators taking into account the standard of saturation and the reason for withdrawal were identified. As in the standard CPAP saturation should be around 86% to 93% to prevent hypoxia SatO2 is below 86% and hyperoxia was SatO2 greater than 93% saturation. The use of TOT occurs during mechanical ventilation, being an invasive technique. Therefore care must be more thorough, since the supply of oxygen is being directed straight into the trachea, bronchi close to.

It is known that oxygen is toxic in excess, and therefore one should always pay attention

to these standards. Patient safety is a peculiarity within the characteristic quality, because contrary to what you are used to thinking aims in the absence of damage, rather than the production of any direct benefit to the patient.<sup>7</sup>

In the case of oxygen therapy by mechanical ventilation using TOT, it has as function the aid in gas exchange of the newborn, for good oxygenation of tissues and organs within the safety standards, and according to the parameters already mentioned, to avoid occurrence of any damages caused by TOT/oxygen is necessary

that these standards are respected in order to avoid undesirable as retinopathy of prematurity events.

Safety initiatives in health care and in neonatal ICU should prioritize the identification and reduction of preventable adverse events. One of these actions is then maintain saturation levels within the standards.

As the table above, 44% of newborns who used TOT shows, met with defaults saturation outside the recommended by the Ministry of Health, which is the value of 86 to 93%. In this case all changes were for more, ie, above 93%.<sup>2,7</sup>

This saturation value, exceeding the recommended, brings the same damage cited in the analysis of CPAP, hyperventilation, hyperoxia and retinopathy of prematurity, which should be avoided, since the hyperoxia may promote reductions in brain and/or blood flow to aggravate injury caused by free radicals, and hyperventilation may lead to excessive hypocapnia, which may reduce cerebral blood flow. This causes brain impairment in newborns inherent quality of care offered.<sup>2,7</sup>

In this case we are talking again about inappropriate use, where preventable problems associated with health care are related to the field of patient safety; entered in the same case as mentioned in the CPAP. Where it is needed with the new technologies that patient safety is constantly updated to use the same, and therefore not offering the proper saturation to the newborn; I'm using improperly the ventilatory support.

The importance of the quality of nursing in the intensive care unit is based on the planning and organization of the service, following established standards governing documents in this hospital. Planning is highlighted as a possibility to modify reality, involving issues such as management, participation, human resources and transformation.<sup>14</sup>

There is also the lack of updating of professionals related to the new saturation limits informed by the Ministry of Health. Thus, the Ordinance 198/2004 was created for the continuing education of health professionals, which provides on National Policies for Continuing Education in health, as a strategy for training and development of employees.<sup>15</sup> If you use this technique of continuing education within the unit, is to reduce risk, improve care and provided quality, and these being performed safely, skill and competence.

The strategy of patient safety for safe care learning from mistakes, creating redundancies and crosschecks, communication and working together, the team of proper care, well trained and rested.<sup>16</sup> As it can be seen, it is a part of safe care, having a well trained staff and updated, in order to have quality.

When speaking on the grounds for removal, it is expected that the reasons are for the end of the statement, ie, improvement of the condition of the newborn. During the research, the reasons for withdrawal were: end of statement with seventy-six (76%), accidental extubation with nine (9%), with six deaths (6%), obstruction of three (3%), and other subjects with six (6%).

Summing all causes for removal of TOT excluding the end of the statement, we have an average of 24%. The complications related to ventilatory assistance in the use of TOT, such as obstruction, accidental extubation, represent a challenge to the multidisciplinary team that provides care to the newborn in the Intensive Care Unit.<sup>5</sup>

When aiming at removal of TOT because of obstruction, it is necessary to think about the causes leading to this event, of which the non-systematic aspiration that remains closely linked to the clogging process; one of the most common causes of obstruction of TOT, and lack of aspiration. For the accumulation of secretions in the tube occurs, preventing the passage of oxygen. This causes discomfort for secretion, and withdrawal, and new installation, which occurs in many cases. Another cause of obstruction, the tube is bent.<sup>2,7</sup>

When not performing aspiration, besides causing obstruction in the TOT, it brings to the newborn respiratory discomfort and poor oxygenation due to difficulty of oxygen reaching the alveoli and performs gas exchange. In addition to the discomfort of other future intubation, damaging the mucosa of the newborn, as well as being a very invasive procedure, especially because of premature newborn.

Another reason was found accidental extubation. Accidental extubation is any sudden extubation due to patient agitation or handling team of caregivers. This usually occurs by the looseness of the TOT,<sup>2</sup> and the Ministry of Health meant that adequate fixation of the tube and clinical and radiological examination to check the positioning of the endotracheal tube is required.

The Institute of Medicine of the United States brings six dimensions of quality-oriented assistance, and they are: safety,



effectiveness, patient-centered care, timely service, efficiency, and equity. 17 As noted, safety should always be present in any type of assistance provided, and it is through a secure service, you can have the same effectiveness. When there are spaces between security assistance, opens space for that adverse events occur.

The Institute points to the adverse event may be preventable and not preventable. By bringing this information to the grounds for withdrawal related to TOT, we can say that the twenty-four (24%) of the reasons are preventable nature because measures were sufficient to bring care and benefits and which would provide the maintenance of the TOT, such as aspiration, care at the time of fixation, etc., so they were not removed.

## CONCLUSION

By analyzing the indicators identified and correlated it with practice through the data collected, it was realized a deficit when it comes to quality, and especially if followed from the gold standard, the best possible quality, in this case based on the security of newborn.

Security is one of the most important questions when we talk about quality dimension, and when you want to prevent adverse events during the working process, it must be followed that thought to what actually occurs safe care and to obtain the best possible quality .

While the numbers found during the search, according to the quality indicators, regarding injuries, grounds for withdrawal patterns and saturation, presented themselves always below 50 % and more than 50% of the care provided within the safety and effectiveness, is not an acceptable number within the quality standards proposed and expected by the national health surveillance agency, hospital accreditation and the Institute of medicine, as all events and throughout the work process and situations that pose risks to newborns can be avoided during the period of hospitalization and during the assists provided. Therefore, there is a need to rethink the number of personnel established to be acting in a neonatal ICU in order to meet the requisites essential quality, and especially the safety of RN.

Upgrading professionals also says a lot about quality, and it is necessary that occurs constantly, as new technologies appear all the time, and information to improve care, assistance. The importance of lifelong learning is seen from notification of events and causes analyzed, these subsidies for a

better care process, preventing recurrence and undesired damage to newborns.

The process of continuing health education should be present on the day to day, from questioning the method of work, which then changing practices those will take place from the scientific-technical update, because it represents a tool which allows Professional review of the technical use of nasal CPAP, TOT and Oxy-Hood.

The key to quality improvement is the reduction of events that may cause harm; there are standards and protocols. Upgrading existing protocols and techniques for the creation of new procedures and assists the unit that still does not have, is a major pillar of the quality of health services. For them, it must contain the tools, rules, routines, procedures and information necessary to perform adequate assistance, and therefore quality. Through this information, and the increasing supply of technologies in our daily lives, it is essential to review the practice, and know that it is possible to reduce the complications and possible harm to the patient.

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