

## PREVENTION AND CONTROL OF INFECTIONS RELATED WITH HEALTH CARE IN NEONATAL UNITS

Prevenção e controle de infecções relacionadas à assistência à saúde em unidades neonatais

Prevención y control de infecciones relacionadas a la asistencia de la salud en unidades neonatales

Halline Cardoso Jurema<sup>1</sup>, Luma Lopes Cavalcante<sup>2</sup>, Naiana Mota Buges<sup>3</sup>

### How to cite this article:

Jurema HC, Cavalcante LL, Buges NM. Prevention and control of infections related with health care in neonatal units. 2021 jan/dez; 13:403-409. DOI: <http://dx.doi.org/0.9789/2175-5361.rpcfo.v13.9085>

### ABSTRACT

**Objective:** To carry out a systematic search in the literature on nursing care in the development of strategies to prevent and control the Infections Related to Health Care at Neonatal Units. **Methods:** It is about a systematic literature review using original articles published between 2008 and 2018, in Portuguese and in English, available at BVC. This review covered the following data bases: LILACS, BDNF and MEDLINE. **Results:** the final sample of the review was composed of seven articles. The studies aimed to cover newborn babies who are in a Neonatal Intensive Care Unit, nurses and the nursing team. The main results found were classified in extrinsic factors which contribute and make it difficult to reduce IRAS. **Conclusion:** the infections related to health care, which affected the newborn babies in Neonatal Units, can be prevented and controlled through simple strategies related to administrative, caring and educational measures.

**Descriptors:** Cross infection; Nursing care; Intensive care, neonatal; Intensive care units, neonatal; Neonatal nursing.

### RESUMO

**Objetivo:** Realizar uma busca sistemática na literatura sobre a assistência de enfermagem no desenvolvimento das estratégias para prevenção e controle das infecções relacionadas à assistência à saúde nas Unidades Neonatais. **Método:** Trata-se de uma revisão sistemática da literatura, que seguiu os procedimentos metodológicos descritos na literatura, a qual utiliza uma metodologia sistemática e explícita para identificar, selecionar e avaliar criticamente as pesquisas já publicadas acerca da temática, entre os anos de 2008 a 2018, nos idiomas português e inglês. **Resultados:** A amostra final da revisão foi composta por 07 artigos. Os principais resultados encontrados foram classificados em fatores extrínsecos que contribuem e dificultam a redução das infecções relacionadas a assistência à saúde. **Conclusão:** As infecções relacionadas à assistência à saúde que acometem os recém-nascidos em Unidades Neonatais, podem ser prevenidas e controladas através de estratégias simples, relacionadas a medidas administrativas, assistenciais e educativas.

**Descritores:** Infecção hospitalar; Cuidados de enfermagem; Terapia intensiva neonatal; Unidades de terapia intensiva neonatal; Enfermagem neonatal.

1 Academic, undergraduate student of Nursing at the University of Gurupi-UnirG, Gurupi-Tocantins-Brazil.

2 Academic, undergraduate student of Nursing, University of Gurupi-UnirG, Gurupi-Tocantins-Brazil.

3 Nurse. Master in Health Sciences. Professor of the Nursing course at the University of Gurupi-UnirG, Gurupi-Tocantins-Brazil.

## RESUMEN

**Objetivo:** Realizar una búsqueda sistemática en la literatura sobre cuidados de enfermería en el desarrollo de estrategias para la prevención y el control de infecciones relacionadas con la salud en unidades neonatales.

**Métodos:** Esta es una revisión sistemática de la literatura, que siguió los procedimientos metodológicos descritos en la literatura, que utiliza una metodología sistemática y explícita para identificar, seleccionar y evaluar críticamente la investigación publicada sobre el tema, desde 2008 hasta 2018, en los idiomas portugués e inglés. **Resultados:** La muestra de revisión final consistió en 07 artículos. Los principales resultados encontrados se clasificaron en factores extrínsecos que contribuyen y dificultan la reducción de las infecciones relacionadas con la atención médica. **Conclusión:** Las infecciones relacionadas con la atención médica que afectan a los recién nacidos en las unidades neonatales se pueden prevenir y controlar mediante estrategias simples relacionadas con medidas administrativas, de atención y educativas.

**Descriptor:** Infección hospitalaria; Atención de enfermería; Cuidado intensivo neonatal; Unidades de cuidado intensivo neonatal; Enfermería neonatal.

## INTRODUCTION

Health Care-Associated Infections (HAIs) are configured as a problem that is directly related to the safety and quality of life of the client, in addition to their effects that can generate a long period of hospitalization, higher expenses and costs for health institutions and for the client and their family members, and worsen with the death of the individual.<sup>1</sup>

The HAIs associated with the Neonatal Intensive Care Units (NICU) can be obtained during the intrapartum stage, expressing up to 48 hours after birth, during the hospital period or up to 48 hours after discharge, except for infections contracted transplacentally.<sup>2</sup>

There are also some authors who delimit the definition according to the period of infection, as follows: early infection, that which comes from the contagion of the newborn through microorganisms present in the birth canal; and late infection, whose onset develops after 48 hours of life, and are usually associated with contamination of the newborn by bacteria from the microbiota of health services.<sup>3</sup>

Due to the prevalence of this problem, the Brazilian Ministry of Health, through Ordinance No. 2616/98, developed the Hospital Infection Control Program (*Programa de Controle de Infecções Hospitalares — PCIH*), which involves a group of systematized strategies and practices, which have with the purpose of eliminating the occurrence of infections.<sup>1</sup> In addition to this program, there was the insertion of the Hospital Infection Control Commission (*Comissão de Controle de Infecção Hospitalar — CCIH*), enabling greater supervision and continuous education of health professionals, which has been helping, year after year, to combat the problem that has involved since the adoption of new technologies to simple changes in the conduct of professionals, such as the correct hand hygiene technique.<sup>4</sup>

But however great the efforts of ministry of health and WHO, is still a major challenge to reduce the high prevalence of HAIs in Brazil and worldwide. Being considered a complication of high magnitude, not least because several hospitals across the country do not have a PCIH that offers quality and efficiency control.<sup>2</sup>

Since there are countless threats found in a NICU, among them: the practice of invasive procedures; the longest hospital stay; low birth weight (LBW); proximity to parents (very early); they are factors that can cause infections, which is totally harmful for the stabilization and improvement of the newborn (NB).<sup>1</sup>

It is notable that the assistance to the NB needs to be individualized and very careful, after all the main gateway for the contamination of these patients is the integumentary tissue.<sup>5</sup>

Due to the relevance of this problem, which, unfortunately, is so recurrent in everyday health services and one of the biggest causes of death in the world, the aim of the present study was to conduct a systematic search in the literature on nursing care in the development of strategies for the prevention and control of HAIs in Neonatal Units.

## METHODS

The research followed the methodological procedures described in the literature, which uses a systematic and explicit methodology to identify, select and critically evaluate the research already published on the topic, according to the methodology described by PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses).<sup>6</sup>

The following guiding question was established: “What factors contribute and hinder the reduction of HAIs in Neonatal Units?”. The review was carried out on the original articles available in the Biblioteca Virtual em Saúde (BVS) databases, which covers other databases such as: *Literatura Latino-Americana e do Caribe em Ciências da Saúde* (LILACS), *Banco de Dados em Enfermagem* (BDENF) and Medical Literature Analysis and Retrieval System Online (MEDLINE).

The search took place during the month of March 2019, in articles published between 2008 and 2018, in Portuguese and English. It was used the health terminology consulted in *Descritores em Ciências da Saúde* (DECS) and Medical Subject Headings (MeSH), by which the respective descriptors were identified: Cross infection (*Infecção hospitalar*); Nursing Care (*Cuidados de Enfermagem*); Intensive care, neonatal (*Terapia intensiva neonatal*); Intensive Care Units, Neonatal (*Unidades de Terapia Intensiva Neonatal*) and Neonatal nursing (*Enfermagem neonatal*). The combination of descriptors was performed using the Boolean operators AND and OR.

Initially, the identification of the articles was carried out by the title of the publications found in the databases, according to the established search strategy. In case of doubt, the study's summary and methodology were read. After

this refinement phase, the abstracts or articles were read in full, to identify the studies that would be part of the review.

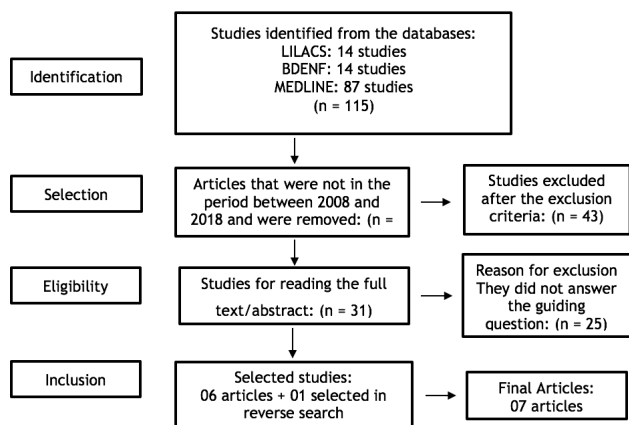
115 publications were found and, as inclusion criteria, the research included articles in full text (of the original type) free of charge, studies that addressed the guiding question, with a time frame from 2008 to 2018 and studies available in Portuguese and English. The established time frame was due to the interest in conducting a review with contemporary studies.

Initially, articles that were outside the time frame were excluded, with 74 studies remaining, subsequently, were applied filters of: language and full text, therefore, 43 documents were excluded at this stage, as they are not in the selected languages or are not available in full; thus, for the analysis of titles and abstracts, 31 articles were included, in this stage, non-original studies (literature reviews) were excluded, in addition to those that were not related to the research question.

In the case of duplicate articles in the databases, they were considered only once. At the end, 6 studies were found that were found during the selection and 1 that was selected by reverse search, so the review consisted of 7 articles.

To better illustrate the search and the reasons for exclusion of the studies, a flowchart was created (Figure 1).

**Figure 1** - PRISMA flowchart of the identification and selection of articles for the systematic review of nursing care that professionals adopt for the prevention and control of HAIs in Neonatal Units. Gurupi, TO, Brazil, 2019

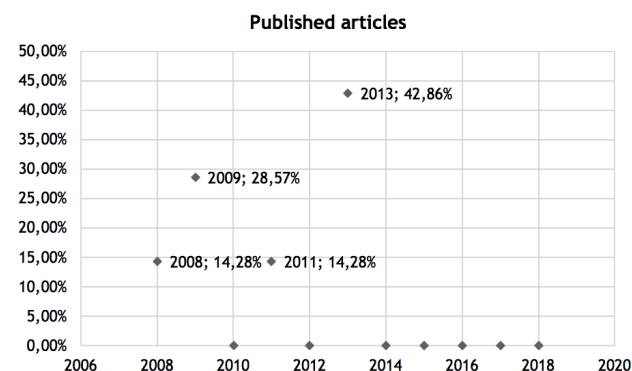


## RESULTS

The final sample of the review consisted of 07 articles. The studies had as target population: newborns hospitalized in NICU, nurses and the nursing staff. With regard to language, in the final sample of the 7 articles, only studies in Portuguese remained. Regarding the frequency and number of studies according to the years, they were: 1 (14.28%) in 2008, 2 (28.57%) in 2009, 1 (14.28%) in

2011, and 3 (42, 86%) in 2013 (Figure 2). Beforehand, it was possible to observe the scarcity of studies related to the theme, which demonstrates the relevance of carrying out more studies that address this issue, and collaborate with methods for the prevention and control of infections in the NICU, since the deficit in the assistance provided is a major risk factor for the newborn.

**Figure 2** - Frequency of articles found in the LILACS, BDNF and MEDLINE databases, which met the research criteria, from 2008 to 2018. Gurupi, TO, Brazil, 2019



The main results found were classified into: extrinsic factors which contribute to and make it difficult to reduce HAIs in Neonatal Units.

The implementation of continuing education; improvement of the physical structure; use of Nursing Care Systematization (NCS); hand hygiene; use of personal protective equipment, standardization of aseptic techniques in carrying out procedures; continuity of care, and strict care with the catheters, were the main extrinsic factors that contribute to the reduction of HAIs in Neonatal Units.

Among the main extrinsic factors that hinder the reduction of HAIs in Neonatal Units were found: lack of previous recognition of contact with infectious diseases; performing unnecessary invasive procedures (orogastric tube; invasive mechanical ventilation; and umbilical catheter); high rate of hospital stay, indiscriminate use of antibiotics empirically; inadequate hand hygiene or non-hygiene; use of adornments; over crowded; complications with patients, and inadequate sizing. For the organization of these studies, the results were categorized in a descriptive way, being analyzed based on the literature, according to the topic, being presented in Table 1.

**Table 1** - Scientific publications found in the LILACS, BDNF and MEDLINE databases, from 2009 to 2018, according to the author, year, country, title, objective and type of study/sample. Gurupi, TO, Brazil, 2019

AUTHOR/YEAR/ COUNTRY	TITLE	OBJECTIVE	TYPE OF STUDY/SAMPLE
Silva ND; Vieira MRR/2008/Brazil	A atuação da equipe de enfermagem na assistência ao recém-nascido de risco em um hospital de ensino.	To characterize nursing care for at-risk newborns, according to the care provided, the factors that favor the improvement of care and the presence of the family for the baby's recovery.	Exploratory descriptive/19 nursing assistants and 3 nurses.
Bittencourt WO et al/2009/Brazil	Taxas de infecção hospitalar em uma unidade de terapia intensiva neonatal.	To identify rates of nosocomial infection related to the vascular tract in newborns hospitalized in the Neonatal Intensive Care Unit of a University Hospital located in the state of Rio de Janeiro in the period from 2005 to 2007.	Quantitative descriptive, with a sample consisting of all newborns hospitalized in 2005 and 2007.
Martinez MR et al/2009/Brazil	Adesão à técnica de lavagem de mãos em unidade de terapia intensiva neonatal.	To evaluate compliance with the hand washing technique employed in a neonatal intensive care unit (NICU) by health professionals and visitors.	Prospective and observational study at a University NICU in Santos (SP).
Tomaz VS et al/2011/Brazil	Medidas de prevenção e controle de infecções neonatais: opinião da equipe de enfermagem.	To know the opinion of the nursing staff on measures for the prevention and control of neonatal infections in newborns.	Descriptive study with 52 nursing professionals.
Cunha KJB et al/2013/Brazil	Representações sociais de infecção neonatal elaboradas por enfermeiras.	To apprehend the social representations of neonatal infection elaborated by nurses and to analyze the relationship of these representations with the assistance to the newborn with infection.	Descriptive and exploratory research conducted with 25 nurses from a public maternity hospital in Teresina-PI, from March to April 2010.
Oliveira COP et al/2013	Caracterização das infecções relacionadas à assistência à saúde em uma unidade de terapia intensiva neonatal.	To characterize neonatal infections related to health care in a neonatal intensive care unit (NICU) of a maternity school in Natal, Rio Grande do Norte.	The study is quantitative, retrospective, of documentary type and was carried out using a form applied to 70 medical records of neonates admitted to the NICU in 2009.
Lorenzini E; Costa TC; Silva EF/ 2013/Brazil	Infection prevention and control in a neonatal intensive care unit	Identify the knowledge of the nursing staff of a Neonatal Intensive Care Unit (NICU) about infection control, identifying the factors that facilitate or hinder the control and prevention of Health Care-Related Infections (IRAS).	Descriptive study with a qualitative approach, carried out with three nurses and 15 nursing technicians, who work in a NICU of a philanthropic institution, in the south region of Brazil.

## DISCUSSION

At birth, the newborn has an absence of bacterial flora, being acquired in the first days of life through the environment, maternal flora, colonization by food, among others. The susceptibility to infection by bacteria and fungi is higher in preterm, LBW and extremely low birth weight neonates, due to the deficiency of the immune system, physiological instability, fragility of the cutaneous and mucous barriers and to the increase of their permeability, prolonged use of antimicrobials, percutaneous catheterization, insertion of a central venous catheter, total parenteral nutrition, mechanical ventilation, and also for staying longer in the NICU.<sup>7</sup>

The importance of quality nursing care is indispensable and evident in Neonatal Units, since it is based on the planning and organization that regulate hospital service.

The promotion of care requires nurses to have knowledge, responsibility and competence, thus offering appropriate care for the development of newborns and their adaptation to the external environment, promoting: stimulating the newborn; maintaining thermal balance; the adequate supply of humidity, light and sound; continuous monitoring of the clinical condition; providing adequate nutrition to meet the metabolic needs of developing organ systems (if possible, through breastfeeding); educating parents/family members, preparing and maintaining an educational plan, for the organization, administration and coordination of nursing care for newborns and mothers; in addition, the development of multidisciplinary activities, to provide guidance and supervision of the care provided by the entire team.<sup>8,9</sup>

NCS is an important tool for reducing risk factors and HAI rates in the NICU, and thus raising efforts to reduce the high rates of neonatal morbidity and mortality, based on adequate technical and epidemiological knowledge.<sup>10,11</sup>

The hand hygiene technique highlighted in 4 of the 7 studies, including one carried out with nursing professionals, showed that hand hygiene is cited as the most important form of infection prevention.<sup>12</sup> It was found that the nursing team knows the factors that contribute and those that hinder the prevention and control of HAIs in the NICU, demonstrating that the proper way to hand wash was also the most mentioned by all study participants.<sup>2</sup>

Although hand hygiene is considered the main measure to reduce hospital infections and even though it is a simple and inexpensive procedure, the lack of adherence by health professionals is a problem. In one of the studies found in this review, carried out with members of the multidisciplinary team, professors, residents and medical students and family members, it was observed that 70% of the studied population did not perform the procedure upon entering the NICU, as well as the correct technique was not performed in any professional category.<sup>3</sup>

It should be noted that the practices of simple measures and low operational cost, such as simple hand hygiene, before and after procedures and the proper use of personal protective equipment, are the main ways of preventing infections, especially in the case of newborns.<sup>13</sup>

For the prevention of HAIs, in addition to the use of PPE's, it is necessary to control and carry out the procedures in an aseptic manner through standardization, which is the protective factor for blocking the spread of pathogens among the assisted population.

It should be included in the routine of care with the newborn, maintenance of temperature and humidity of the environment, positioning, use of skin solutions for antisepsis, care in performing invasive procedures, such as venous or arterial punctures, and fixation of devices, removal of adhesives used to fix life support devices and equipment and body hygiene routines, and also perform the hygiene of the umbilical region, as this is an important protective factor against omphalitis.<sup>14</sup>

Furthermore, strict care with catheters and connectors, antibiotic prophylaxis, availability of individual material for the newborn, cleaning of the unit, disinfection of materials and use of sterile material are also important.<sup>12</sup>

Preterm newborns (PTNB) are at high risk for developing infections, due to the physiological conditions present and the need for a wide variety of procedures when hospitalized. All procedures and devices predispose them to the formation of skin lesions. The lesion, in turn, is more subject to contamination by microorganisms present in the environment and on the PTNB's own skin. In addition to preserving skin integrity, skin care should prevent chemical toxicity resulting from the destruction of the protective lipid barrier.<sup>14</sup>

It was observed that neonatal nosocomial infection is the cause of high costs and infant mortality, however they reveal that adopting attitudes and behaviors that promote continuity of care and the cooperation of the team could bring benefits to reduce these parameters.<sup>15</sup>

Among the risk factors for newborns themselves, birth weight stands out, because the lower the weight, the greater the risk of contracting some type of infection, it is estimated that for every 100g less after birth, the risk of contracting an infection increases by 9%. The more premature the NB, the more immature his humoral and cellular immunity will be, the greater the need for invasive procedures to be performed, and this causes newborns to be colonized by bacteria from the hospital environment, often resistant to antibiotics and with greater virulence. On the other hand, the main risk factors related to local conditions of hospitalization are related to the disproportion between the number of newborns hospitalized and the number of professionals in the health team, the physical area and the availability of human resources at the units, outside the standards recommended by Anvisa (Brazilian National Health Surveillance Agency).<sup>16</sup>

The results of the studies show that continuing education is another important measure that aims to establish and maintain adherence to techniques and, perhaps, campaigns that perpetuate their fulfillment.<sup>3</sup>

The length of stay in the NICU is one of the main risk factors for colonization and infection by hospital germs. Early contact with the mother and breastfeeding promotes the colonization of newborns by microorganisms of the maternal flora, protecting it, in part, against colonization by hospital germs. Therefore, the clinical practice of health professionals and the infrastructure for assistance can interfere in the rates of infection and mortality for inpatients, regardless of the place of birth.<sup>17</sup>

The diagnosis of infections in newborns is often difficult, since the clinical manifestations are nonspecific and can be confused with other diseases of this age group. Infections can manifest by one or more of the following signs: deterioration of the general condition, hypothermia or hyperthermia, hyperglycemia, apnea, food waste, respiratory failure, shock and bleeding.<sup>16</sup>

It was observed that in order to be effective in combating infections in neonatal units, professionals need administrative support from the institution.<sup>18</sup> And for that, it is mentioned that the scales are exclusive to one or two professionals trained on duty to handle central venous devices; that a control map of intravenous devices be created to record the conditions for handling these as well as the professionals involved.<sup>13</sup>

Regarding human resources, in addition to the need to maintain an adequate proportion between team members and the number of newborns assisted, the training of professionals is important. It is essential to have a trained team to perform all invasive procedures with the use of appropriate technique.<sup>16</sup>

For the prevention and control of HAIs, the establishment of priorities is indispensable, there must be the establishment of policies, standardization of implantation and maintenance of invasive devices in health institutions.<sup>19</sup>

Professional training is required, a topic on which it is observed that approximately 31% of professionals have not taken specific courses for specific problems in the last five years.<sup>12</sup> These training courses must be developed in conjunction with the CCIH.<sup>19</sup>

In this perspective, it is important to highlight the role of nurses in the prevention and control of infections, as they act in direct contact with clients, manipulate and control equipment, instruments and medications, in addition to many of these professionals taking on a prominent role in the CCIH's, and other spaces in the health sector that specifically address this issue.<sup>20</sup>

It is noted through the study that neonatal infection is not associated only with the care provided by the nursing team, but by everyone who works to assist the newborn either directly or indirectly, however, it is worth highlighting the potential educating role of the professional nurse in front of the team and companions/visitors, who, in addition to the duty to know the infection prevention alternatives, need to spread this information to the team and the public in question.

## CONCLUSION

It was evidenced through the study that the HAIs that affect the NBs in Neonatal Units can be prevented and controlled through simple strategies, related to administrative, assistance and educational measures.

Nurses are important agents in this context, as they collaborate, through the management of their team, applying and directing them as to the appropriate practices and adoption of the correct techniques in the management of the patient, since the contact, be it direct or indirect, is the most common and important mechanism in colonization and/or infection to the NB.

The use of NCS is the main instrument for managing the performance of the nursing team, minimizing risk factors and high rates of HAIs in these units, and through this tool, contributing to the reduction of neonatal morbidity and mortality rates.

However, it is not enough that the nursing team acts as a transforming agent of preventive care, health institutions must adapt and offer administrative and educational support to the entire multidisciplinary team, promoting qualifications and training, after all, it is necessary that they are updated and in constant learning to exercise more effectively and efficiently the assistance that is required.

The use of a simple and standardized tool by all professionals involved in care avoids harm and thus significantly reduces the mortality resulting from HAIs in Neonatal Units, it is

suggested that neonatal care services carry out their actions based on protocols, taking into account the basis of the local epidemiological study, so the teams will be able to have an operational guide with a view to preventive measures.

## REFERENCES

1. Barros MMA, Pereira ED, Cardoso FN, Silva RAD. O enfermeiro na prevenção e controle de infecções relacionadas à assistência à saúde. [Online Publishing]; 2016. Accessed on August 25, 2018. Available at: <<https://www.publicacoesacademicas.uniceub.br/cienciasaude/article/viewFile/3411/3066>>
2. Lorenzini E, Costa TC, Silva EF. Prevenção e controle de infecção em unidade de terapia intensiva neonatal. *Revista Gaúcha Enfermagem*. Porto Alegre, v. 34, n. 4, dez., 2013. Accessed on March 27, 2019. Available at: <<http://www.scielo.br/pdf/rgefn/v34n4/14.pdf>>
3. Martinez MR, Campos LAAF, Nogueira PCK. Adesão à técnica de lavagem de mãos em unidade de terapia intensiva neonatal. *Rev. Paul. Pediatr.* 2009; 27(2): 179-85. Accessed on March 27, 2019. Available at: <<http://www.scielo.br/pdf/rpp/v27n2/10.pdf>>
4. Brasil. Agência Nacional de Vigilância Sanitária. Assistência Segura: Uma Reflexão Teórica Aplicada à Prática. Brasília: ANVISA, cap. 11, p. 141-153, 2017. Accessed on September 8, 2018. Available at: <<http://portal.anvisa.gov.br/documents/33852/%203507912/Caderno+1+-+Assist%C3%A2ncia+Segura++Uma+Reflex%C3%A3o+Te%C3%B3rica+%20Aplicada+%C3%A0+Pr%C3%A1tica/97881798-cea0-4974-9d9b-077528ea1573>>
5. Paula AO, Salge AKM, Palos MAP. Infecções relacionadas à assistência em saúde em unidades de terapia intensiva neonatal: uma revisão integrativa. *Revista Eletrônica Trimestral de Enfermagem*. Goiânia, n. 45, p. 523-536, 2017. Accessed on February 18, 2019. Available at: <[http://scielo.isciii.es/pdf/eg/v16n45/pt\\_1695-6141-eg-16-45-00508.pdf](http://scielo.isciii.es/pdf/eg/v16n45/pt_1695-6141-eg-16-45-00508.pdf)>
6. Galvão TF, Pansani TSA, Harrad D. Principais itens para relatar Revisões sistemáticas e Meta-análises: A recomendação PRISMA. *Epidemiol. Serv. Saúde*, Brasília, v. 24, n. 2, p. 335-342, abr./jun., 2015. Accessed on February 18, 2019. Available at: <<http://www.scielo.br/pdf/ress/v24n2/2237-9622-ress-24-02-00335.pdf>>
7. Araújo BBM, Maximo MR. As infecções hospitalares no cenário da terapia intensiva neonatal: uma contribuição para enfermagem. *R. Pesq.: Cuid. Fundam.* Online 2011. abr./jun. 3(2):1923-34.
8. Silva ND, Vieira MRR. A atuação da equipe de enfermagem na assistência ao recém-nascido de risco em um hospital de ensino. *Arq. Ciênc. Saúde*, 2008, jul-set.; 15(3):110-6. Accessed on March 27, 2019. Available at: <[http://repositorio-racs.famerp.br/racs\\_ol/vol-15-3/IDN273.pdf](http://repositorio-racs.famerp.br/racs_ol/vol-15-3/IDN273.pdf)>
9. Santos APS, Silva MLC, Souza NL, Mota GM, França DF. Diagnósticos de enfermagem de recém-nascidos com sepse em uma Unidade de Terapia Intensiva Neonatal. *Rev. Latino-Am. Enfermagem* mar.-abr. 2014; 22(2): 255-61.
10. Torres E, Christovam BP, Fuly PCS, Silvino ZR, Andrade M. Sistematização da assistência de enfermagem como ferramenta da gerência do cuidado: estudo de caso. *Esc Anna Nery* [online]. 2011 out/dez; 15(4): 730-6. Available at: <[http://www.scielo.br/scielo.php?script=sci\\_abstract&pid=S1414-81452011000400011&lng=en&rm=iso&tlng=pt](http://www.scielo.br/scielo.php?script=sci_abstract&pid=S1414-81452011000400011&lng=en&rm=iso&tlng=pt)>
11. Castilho NC, Ribeiro PC, Chirelli MQ. A implementação da sistematização da assistência de enfermagem o serviço de saúde hospitalar do Brasil. *Texto & contexto enferm* [online]. 2009; 8(2): 280-9. Available at: <<http://www.scielo.br/pdf/tce/v18n2/11>>
12. Tomaz VS, Neto FHC, Almeida PC, Maia RCF, Monteiro WMS, Chaves EMC. Medidas de Prevenção e Controle de Infecções Neonatais: opinião da Equipe de Enfermagem. *Rev Rene*, Fortaleza, 2011 abr/jun; 12(2):271-8. Accessed on March 27, 2019. Available at: [http://www.repositorio.ufc.br/bitstream/riufc/11981/1/2011\\_art\\_vstomaz.pdf](http://www.repositorio.ufc.br/bitstream/riufc/11981/1/2011_art_vstomaz.pdf)
13. Bittencourt WO, Lima ROS, Barbosa JLS, Honório RB. Taxas de Infecção Hospitalar em uma Unidade de Terapia Intensiva Neonatal. *Rev. de Pesq.: Cuidado é Fundamental Online*. 2009, mai./ago.; 1(1): 51-58. Accessed on March 27, 2019. Available at: <http://www.seer.unirio.br/index.php/cuidadofundamental/article/view/279/304>

14. Organização Pan-Americana da Saúde. Centro Latino-Americano de Perinatologia, Saúde da Mulher e Reprodutiva. Prevenção de infecções relacionadas à assistência à saúde em neonatologia. Montevideu: CLAP/SMR-OPS/ OMS, 2016. (CLAP/SMR. Publicação Científica, 1613-03).
15. Cunha KJB, Moura MEB, Nery IS, Rocha SS. Representações sociais de infecção neonatal elaboradas por enfermeiras. Rev. enferm. UERJ, Rio de Janeiro, 2013, out/dez; 21(4): 527-32. Accessed on March 27, 2019. Available at: < <http://www.facenf.uerj.br/v21n4/v21n4a18.pdf>>
16. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Ações Programáticas Estratégicas. Atenção à saúde do recém-nascido: guia para os profissionais de saúde / Ministério da Saúde, Secretaria de Atenção à Saúde, Departamento de Ações Programáticas Estratégicas. 2. ed. atual. – Brasília: Ministério da Saúde, 2014.
17. de Souza B. Pinheiro, Monica; Nicoletti, Christiane; Boszczowski, Icaro; Mineko T. Puccini, Dilma; T. S. Ramos, Sonia Regina Infecção hospitalar em Unidade de Terapia Intensiva Neonatal: há influência do local de nascimento? Revista Paulista de Pediatria, vol. 27, núm. 1, março, 2009, pp. 6-14 Sociedade de Pediatria de São Paulo São Paulo, Brasil.
18. Oliveira COP, Souza NLS, Silva EMMS, Silva JB, Saraiva EM, Rangel CT. Caracterização das Infecções Relacionadas à Assistência à Saúde em uma Unidade de Terapia Intensiva Neonatal. Rev. Enferm. UERJ, Rio de Janeiro, 2013, jan./mar.; 21(1): 90-4. Accessed on March 27, 2019. Available at: < <https://www.e-publicacoes.uerj.br/index.php/enfermagemuerj/article/view/6370>>
19. Brasil. Agência Nacional de Vigilância Sanitária Medidas de Prevenção de Infecção Relacionada à Assistência à Saúde. Brasília: Anvisa, 2017.
20. Giroti SKO, Garanhani ML. Infecções relacionadas à assistência à saúde na formação do enfermeiro. Rev. Rene, 2015, jan.-fev.; 16(1):64-71.

Received in: 14/06/2019

Required revisions: 16/10/2019

Approved in: 30/10/2019

Published in: 15/03/2021

---

**Corresponding author**

Naiana Mota Buges

**Address:** Rua João de Souza Brito, 166, Alto da Boa Vista  
Gurupi/TO, Brazil

**Zip code:** 77.425-410

**E-mail address:** [naiana\\_mota@yahoo.com.br](mailto:naiana_mota@yahoo.com.br)

**Telephone number:** +55 (63) 998507-1124

---

**Disclosure: The authors claim to  
have no conflict of interest.**