

## Cuidados com a pele do recém-nascido internado em unidade de terapia intensiva neonatal: revisão integrativa

Skin care to newborns admitted in neonatal intensive care unit: integrative review

Cuidados con la piel del recién nacido internado en una unidad de terapia intensiva neonatal: revisión integradora

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### ABSTRACT

**Objective:** to describe the nature and development in nursing scientific production on the theme “skin care to the newborns” (NB). **Method:** a literature search with descriptive, exploratory and qualitative approach was carried out in the LILACS, PUBMED and BDENF databases. Eleven articles were selected. **Results:** after reading the studies, the analysis was performed with six national publications and five international publications. Seven studies had qualitative approach and four studies, quantitative approach. This study allowed to know the care provided and ways of monitoring the evaluation of the skin of newborns. **Conclusion:** few studies on care of newborn skin were found. The development of studies aiming to contribute to the preparation and review of protocols to provide care to prevent diseases in newborns is recommended.

**Descriptors:** Newborn; Skin; Nursing Care; Patient Safety.

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## RESUMO

**Objetivo:** descrever a natureza e a tendência na produção científica de enfermagem sobre a temática “cuidados com a pele do recém-nascido (RN)”. **Método:** realizou-se uma pesquisa bibliográfica do tipo exploratório e descritiva, com abordagem qualitativa, nas bases de dados LILACS, BDNF e PUBMED, com seleção de 11 artigos. **Resultados:** após a leitura dos estudos, foram analisadas seis publicações nacionais e cinco publicações internacionais. Sendo sete estudos de abordagem qualitativa e quatro estudos de abordagem quantitativa. Este estudo possibilitou conhecer cuidados e formas de acompanhamento na avaliação da pele do neonato. **Conclusão:** evidenciaram-se poucos estudos sobre a temática de cuidados com a pele do recém-nascido. Sugere-se o desenvolvimento de estudos que colaborem para a elaboração e revisão de protocolos de assistência direcionados à prevenção de agravos ao recém-nascido.

**Descritores:** Recém-Nascido; Pele; Cuidados de Enfermagem; Segurança do Paciente.

## RESUMEN

**Objetivo:** describir la naturaleza y la tendencia en producción científica de enfermería en el tema del cuidado de la piel del recién nacido (RN). **Método:** se realizó una búsqueda bibliográfica de enfoque cualitativo exploratorio descriptivo en las bases de datos LILACS, BDNF y PUBMED, con una selección de 11 artículos. **Resultados:** Después de leer los estudios, se analizaron seis publicaciones nacionales y cinco publicaciones internacionales. Siete estudios con enfoque cualitativo y cuatro estudios de un enfoque cuantitativo. Este estudio permitió el conocimiento de los cuidados y formas en el seguimiento de la evaluación de la piel del recién nacido. **Conclusión:** fueron encontrados unos pocos estudios sobre el tema del cuidado de la piel del recién nacido. Se sugiere el desarrollo de estudios que contribuyan a la preparación y revisión de los protocolos de atención dirigidos a la prevención de lesiones en el recién nacido.

**Descriptorios:** Recién Nacido; Piel; Atención de Enfermería; Seguridad del Paciente.

## INTRODUCTION

The skin, a membrane under continuous development in the newborn (NB), has a vital role in the neonatal period, as it provides a protective barrier that helps to prevent infections, facilitates thermoregulation and helps to control the insensible water loss and electrolyte balance.<sup>1</sup>

At birth, the skin layers, epidermis, dermis and subcutaneous tissue have reduced thickness and the skin appendages are less developed. Sweating due to heat begins only on the third day of life, there is little lubrication of the skin what causes vulnerability to dryness, greater sensitivity to irritant substances, lower response to allergen products, more central than peripheral circulation, thus predisposing to difficulty in thermoregulation.<sup>2</sup>

The main focus of the nurse is the care for human beings. This is the essence of the profession and takes place in the context of the nurse experiences. When this activity is carried out in neonatology, the care focused on the skin of newborns has become a concern because the skin must be kept as intact as possible, aiming to preserve its protective function of internal organs against external agents.<sup>3</sup>

For the nursing staff, care for the NB in a safe and individualized manner involves much more than knowledge and technical skills. Knowing how to provide care is a comprehensive task, involving touch, handling, interacting and communicating with the baby.<sup>4</sup>

Currently, one of the great challenges of the nurse is to assist the NB. The technological advancement has contributed to reduce infant mortality rates, especially among extremely premature newborns. However, the Environment of Neonatal Intensive Care Unit (NICU) exposes this small human being to excessive handling during its most critical phase of adaptation to extra-uterine life, by painful procedures and also routine care.<sup>4</sup>

Intensive care in the NICU represents a challenge for the nursing staff with respect to keeping the NB's skin integrity because of the need for inserting tubes, sensors, probes, catheters and so forth. How to combine the high technological density in the NICU and, at the same time, provide excessive care in preserving this membrane that corresponds to 13% of body surface is an issue.<sup>5</sup>

For premature newborns (PNB), the preservation of skin integrity is an even more important aspect because the prevalence of sepsis in this age, after the third day of life, is of 21%, with a mortality rate of 18%. Most of these cases occur in the first week of life when the function of the epidermal barrier is highly compromised<sup>6</sup>. Some nursing interventions are necessary to maintain skin integrity, such as preventing physical and chemical injury, minimizing the insensible loss of water, keeping the temperature stable and preventing infections.<sup>5</sup>

Many are the care actions provided to newborns in the NICU, including bath, lubrication with emollient oils, the use of skin solutions for antisepsis, fixation of adhesives to support monitoring devices and attention to avoid heat loss. It is important to note that 80% of NBs develop some skin injury by the first month of life, especially those born prematurely.<sup>5</sup>

Skin lesions have generated discussions in nursing, especially in the hospital environment. Skin lesions, especially pressure ulcers (PU), are important indicators of quality of care. These were established by Decree MS/GM n° 529/2013, National Program of Patient Safety (NPPS), with the focus to monitor the incidence of PU, as well as to establish institutional programs to minimize this kind of injury.<sup>6</sup>

To qualify the skin care provided to NBs it is fundamentally important that nurses standardize their actions, routinely evaluating the newborn's skin condition by identifying and eliminating risk factors. By doing this, nurses will be able to provide systematic, individualized and safe care.<sup>1</sup>

The constant evaluation of the neonate's skin is an integral activity of the nursing work, directed toward preventing injuries, seeking one of the points of excellence in the quality of care.<sup>7</sup>

Based on these considerations, the following question was raised: what has been produced in the scientific literature on the topic of skin care provided to newborns? Thus, this study aimed to describe the nature and development in the nursing scientific production on the theme “skin care to NBs”.

## METHOD

This is a literature research with narrative form. Data collection was conducted using the keywords: newborn and skin and nursing care and intensive care unit. MeSH descriptors were also used (*Medical Subject Headings*): newborn infant and skin and nursing care and intensive care units, totaling 95 articles found.

The survey was carried out by consulting the website of the Virtual Health Library (VHL) in the Lilacs database (Latin American and Caribbean Health Sciences), Bdenf (Nursing Database) and PubMed (National Library of Medicine of the United States). The search for journals occurred in January and February 2014.

In the next step, a selection of studies took place by applying the inclusion criteria. Selection criteria were: articles published in the last 10 years (2004-2014) in Portuguese, English and Spanish that addressed procedures, interventions or guidelines for nursing care to the NB skin integrity. Articles that were repeated in any of the three databases and articles not available in full length were excluded. After this selection, 11 productions were kept, four from LILACS database, two from BDEF and five from PUBMED. This is shown in Table 1.

For analysis of the selected articles, data were organized in a synoptic analytical table containing the following variables: title of the research, author, journal, year and type of study. Within each article, ideas were grouped by similarity to develop a descriptive synthesis. The data in the table were submitted to thematic content analysis as *corpus*. For this, we followed the steps of pre-analysis, material exploration, processing and interpretation of obtained results.<sup>8</sup> Below are the findings presented in a descriptive way.

**Table 1** - Selected publications in databases addressing the theme “skin care to NBs”, Santa Maria, 2014.

Code	Scientific productions	AUTHOR(S)	Journal	Year	Study type
A1	Care to the NB skin: concept analysis	FONTENELE FC, PAGLIUCA LMF, CARDOSO MVL.	Rev. Esc. Anna Nery	2012	Documental
A2	Care with the NB skin in the NICU: The nurse's Knowledge.	ROLIM KMC, LINHARES DC, RABELO LS, et al	Rev. Rene	2008	Descriptive-observational
A3	Nursing care to the NB skin in the NICU.	SOUSA AM, MONTE EC, MIRANDA IN, et al	Rev. pesq. Cuidado fund.	2011	Exploratory-descriptive
A4	Nurses performance in preventing NB skin lesion.	ROLIM KMC, FARIAS CPX, MARQUES LC, et al	Rev. Enferm UERJ	2009	Descriptive
A5	Bath and colonization of preterm skin	CUNHA, ML, PROCIANOY, R.	Rev. Gaúcha de enfer.	2006	Exploratory
A6	Effect of Less Frequent Bathing on Premature Infant Skin	QUINN D, NEWTON N, PIECUCHR	JOGNN	2005	Clinical-randomized
A7	Nursing Care Guidelines for prevention of nasal breakdown in neonates receiving nasal CPAP.	McCoskey, L.	Adv. Neonatal care	2008	Exploratory-descriptive
A8	Incidence and risk factors of pressure ulcers in seven neonatal intensive care units in Japan: a multisite prospective cohort study.	FUJII K, SUGAMA J, OKUWA M, et al.	Int Wound J	2010	Prospective cohort study
A9	Permanence of the semipermeable membrane in the skin of the newborn: a differentiated care	ROLIM, KMC. BARBOSA, RMA. MEDEIROS, RMG	Rev. Rene	2010	Exploratory-descriptive
A10	Neonatal intensive care practices and the influence on skin condition	VISSCHER MO, TAYLOR T, NARENDRAN V	J Eur Acad Dermat. Venereol	2013	Retrospective study
A11	Validity and Reliability of the Neonatal Skin Condition Score	LUND, CH; OSBORNE JW.	JOGNN	2004	Validation study

Source: Author, 2014.

## RESULTS AND DISCUSSION

Eleven articles that met the inclusion criteria previously established were analyzed in the present study. First, a general characterization of the evaluated articles will be presented.

Analyzed articles were distributed between the years 2004 and 2013 with a higher incidence of publications in 2008 and 2010 (18.10%) and the other years had an incidence of 9.0%. Among analyzed articles, six are national and five are international studies.

The authors of the articles used various methods and approaches in their research, including exploratory/descriptive with qualitative approach (5); observational exploratory with qualitative approach (1); documental/qualitative study (1); instrument validation study with a quantitative approach (1); randomized clinical/quantitative (1); prospective cohort/quantitative study (1); retrospective/quantitative study (1).

The reading of the studies resulted in the identification of several care measures and interventions that increasingly require theoretical and practical update from nurses and studies related to the care of the NB's skin integrity.

The categories that emerged after thematic content analysis of the studies will be discussed in the sequence.

### Evaluation and monitoring of the newborn skin condition in the Intensive Care Unit

Conceptualizing the care with the NB's skin, the study A1 showed a relationship between prematurity and the risk of infection, determining the characteristics of long-term care. The understanding of the complex dynamics of the physiological changes that occur in the NB skin is essential for health professionals as it is what determines and guides the practices that enhance the exchange of knowledge between different expertises.<sup>3</sup>

A number of factors that contribute to the maintenance of the newborn's skin integrity are known, but beyond the knowledge of the physiological changes of the NB's skin, it is also necessary to establish a consensus on certain care measures and/or techniques, standardizing the actions of all professionals that assist this NB, favoring prevention of skin lesions.<sup>9</sup>

Regarding nursing skin care to NBs, eight (8) studies were analyzed. In the study A2, the knowledge of the nurse in the care of the skin of premature newborns (PNBs) was highlighted, and the protection and preservation of the skin of the NB were put as essential for neonatal health. Regarding the care of the skin of PNBs, the construction of guidelines for the systematization of nursing care directed to skin care is necessary and imminent.<sup>4</sup>

Regarding this theme, the knowledge of professionals about the care on the handling of premature the NB and his skin and the limit of each intervention is crucial. It is necessary to introduce measures to promote the development

of the corneous stratum and prevent the action of toxins and infectious agents until the skin maturity is complete.<sup>2</sup>

In addition to the skin care of PNBs, the other NBs hospitalized in NICUs also need an attentive look in relation to their skin because of the many manipulations, procedures and interventions that can cause skin lesions. In the study A3, it was evident that nursing should base actions on scientific knowledge for an individualized and safe care, aiming to establish guidelines to reduce risk of unwanted changes in conducts, thus providing qualified care to these small clients.<sup>10</sup>

The role of nurses in the NICU is essential, as one dedicates 24 hours a day to the patient, performing specific functions in the adaptation of the NB to extrauterine life. They also have a role in the constant observation of clinical symptoms, by physical examination, monitoring vital signs and providing special assistance procedures.<sup>9</sup>

Among some daily care actions developed by nurses to keep the NB's skin integrity shown in studies are: decubitus change, keeping the skin sanitized and dry, providing the rotation of oximeter sensors, use of hydrocolloids in bony prominences and in places where orogastric and endotracheal tubes shall be fixed. They also organize the collection of set of exams, thus avoiding repeated punctures.<sup>10</sup>

The study A4 also describes other precautions such as using adhesives in small amounts, systematic evaluation of skin care in removing adhesives, lubrication with emollient oils, the use of cutaneous solutions for antiseptics, transparent adhesive dressings and care measures that may reduce water and heat loss.<sup>5,11</sup>

In addition to the care described above, other care measures such as those related to the umbilical stump, prevention and treatment of extravasation and infiltration of intravenous solutions are cited. Other measures include the identification of common skin lesions such as toxic erythema, diaper dermatitis, milium and hyperplasia of the sebaceous glands.<sup>1</sup>

Another very important skin care measure to newborns is related to bathing. The study A5 describes the recommendations of the *Association of Women's Health Obstetric and Neonatal Nurses-AWHONN*, amongst them, avoiding the daily bath with soap, and alternating baths only with water and baths with water and neutral pH soap. The application of topical agents like soap dissolves the acid coverage, responsible for preventing bacterial colonization and promoting moisture retention in the skin barrier. This, thus, promotes the colonization of the skin by hospital microorganisms, favoring hospital infections.<sup>12</sup>

In PNBs below 32 weeks of gestational age, the use of warm sterile water to remove body fluids is recommended and in the case of PNBs below 26 weeks of gestational age, the recommendation is to use only sterile water for bathing, as this does not change flora of the skin.<sup>12</sup>

The first bath must take place in a warm environment, the water must be sterile and heated, it should be used in

NBs that have absolutely no rupture in the skin. The vernix caseosa should not be completely removed in the first bath.<sup>2</sup>

The study A6 compared the effect of bath performed on a daily basis on the NB's skin flora with bath performed every four (4) days and showed that it is safe to carry out the bath every 4 days, which does not incur in a significant increase of colonies. Furthermore, research evidence describes physiological and behavioral increased stress on PNBs associated with the bathing procedure, thus, it is, prudent to reduce the exposure to this factor.<sup>13</sup>

Studies highlight the importance of conducts that must be adopted by the nursing staff in order to reduce the risk of injury and infection. However, simple strategies and measures imposed by nurses to reduce routines such as those prohibiting daily baths in premature infants weighing less than 1500g, changing old practices of immediate removal of the vernix caseosa in neonates, among others, are still under discussion.<sup>14</sup>

The study A7 still bring up the skin care to NBs using the Continuous Positive Airway Pressure (CPAP) equipment. This equipment is used as a means of respiratory support for Acute Respiratory Distress Syndrome in many NBs, especially premature babies. The maladaptation to this equipment on the face of the NB, especially in the nostril, may cause pressure points causing degradation of the nasal septum. It is recommended that the nurse be alert to the proper positioning of this equipment on the NB, taking care for not to cause pressure points between the equipment and the skin of the NB.<sup>15</sup>

In a case report study, nurses used a technique that consists in the simultaneous use of two dressings fixed between the columella and nasal prongs, keeping a distance recommended by the literature and preventing injury to the nasal septum. After 13 days using the nasal CPAP, premature NBs at 29 weeks of gestational age had their skin intact. Besides the use of the two dressings, the importance of using a prong with the appropriate size to the NB is stressed.<sup>16</sup>

Regarding risk factors that are associated with the occurrence of skin lesions such as pressure ulcers (PU). The study A8 showed that 50% of PU in NICUs occur in the nasal region, especially in NBs who are using nasal CPAP. The main risk factors are the immature skin texture and endotracheal intubation. Periodic assessment to prevent the PUs and development of materials for nasal protection are suggested.<sup>17</sup>

Studies recommend skin hydration of the NB using proper products such as the Medium Chain Triglycerides (MCT) to prevent PUs. They have excellent topical absorption, providing a protective film on the NB. It is also recommended to use egg box mattress, which provides greater comfort and reduces pressure area due to its shape. Perform decubitus change when handling the newborn is also a conduct useful to prevent PU.<sup>14</sup>

It is noteworthy that in addition to preventing the PU, it is necessary to prevent dryness or cracking of the skin. It is indicated that after bathing, the skin of newborns must

be hydrated with a suitable emollient, preventing drying of the skin and thus protecting the corneous stratum, which consequently maintains the cutaneous barrier.<sup>18</sup>

Skin care practices held in NICUs also include the use of products to create a semipermeable barrier between the skin and the adhesive. Currently, one of the most used practice is the application of polyurethane semipermeable membrane, which can be used to attach sensors of skin temperature, pulse oximeter, among others.<sup>11</sup>

The study A9 aimed to identify bacterial colonization after removal of the semipermeable membrane of the anterior chest of PNBs, and it reached the conclusion that there was no dermatologic change or presence of infection on the skin of PNBs. The skin cultures detected *Staphylococcus epidermis*, *Staphylococcus aureus*, *Escherichia coli*, *Klebsiella*, *Pseudomonas*, *Serratia* and *Candida albicans*; microorganisms that reflect the type of nosocomial colonization.<sup>11</sup>

Regarding the use of semipermeable membrane in NBs soon after birth, the study showed improvement in the maintenance of sodium, water quota, urine density and glucose levels of NBs, maintaining more stable condition, thus providing early recovery of these NBs.<sup>19</sup>

Besides all the care to maintain the integrity of the skin, it is essential that nurses be sensitive, seeking a reflective practice and focused on scientific knowledge and on the individualized and safe care of the newborn.

A study conducted in the United States of America (A10) aimed to examine the effects of prematurity and time of maturation and integrity of the skin of NBs from birth to the period of hospitalization in NICU. This showed that preterm infants exhibited significantly lower perineal irritation (redness and itching) and better skin integrity in relation to term NBs.<sup>20</sup>

This is because preterm NBs take more time/days to eliminate the first feces and in lesser amounts, exposing less the perineal region. This delayed contact was also related to the nutritional status and medical diagnosis. It is worth noting the importance of preventive intervention measures to prevent skin changes such as topical barriers, frequent change of diapers.<sup>20</sup>

Recent studies report that the skin continues to develop until 12 months after birth. The skin of the neonate is subjected to a process of adaptation to the extrauterine environment, requiring special care. Regarding the skin in the contact zone with diapers, this zone is easily harmed by mechanical friction, due to the repeated need for removing excrete. This causes the removal of the corneous stratum cells, increasing skin permeability and favoring the occurrence of diaper dermatitis.<sup>18</sup>

In order to evaluate the NB's skin conditions, the AWHONN and the NANN conducted a study to validate the *Neonatal Skin Condition Score* (NSCS), in which a sample of 2,820 NBs in 51 NICUs in 27 states located throughout the US territory was assessed (A11). The scale was applied on

average every three days by nurses duly trained. The NSCS describes the general condition of the skin of hospitalized newborns and can identify intervention needs in relation to skin care.<sup>21</sup>

This study showed that the NSCS and its domains (erythema, dryness and rupture/damage) are reliable both for the use in a single individual baby repeatedly evaluated over time and for several babies using at the same time. In addition, the reliability of this scale is acceptable in all weight groups and racial groups.<sup>21</sup>

The choice of an appropriate instrument to assess and identify risks in newborns is an important step to determine preventive measures and treatment of skin lesions. Professional teams benefit from the use of risk assessment scales, using them as a guide. In addition to the uniformity of the evaluation results, keeping the risk in focus, this makes it possible to standardize and improve conducts in the care of the skin of the newborn.<sup>22</sup>

In the search for the theme of skin care to NBs, few studies describing the conditions, care and interventions regarding the skin of the NB hospitalized in NICUs were found. There is a justified need for these studies, therefore, to shed light on this theme, to contribute to a safer and more systematic assistance.

## CONCLUSION

This study showed the importance of nurses to acquire theoretical and practical knowledge of the anatomy, physiology and care to the NB's skin. Knowledge of the skin characteristics of term and preterm NBs determines the specific care to be provided to these clients, giving a base to the standardization of actions and nursing care toward each newborn. The care for the NB's skin integrity must be present from the very moment of its birth, making it possible that it develops to maturity, and then assuming its function of barrier as early as possible.

Faced with so many procedures and manipulations performed in the NICU, maintaining the skin integrity is a challenge to all health team professionals, especially nurses who have direct contact with the NB. Therefore, it is essential that nurses monitor the NB skin conditions, providing a safe and unique care to this tiny client.

Currently, science and technology have advanced and benefited the field of neonatology. Protection, prevention and treatment of newborn skin lesions are increasingly evident. Therefore, it is imperative that the nurse is under a constant process of lifelong learning, contributing to the preparation and review of care protocols aimed at disease prevention in newborns.

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