

Wound Care in Neonatology



BY
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Skin lesions observed in paediatric patients, although different from those of adults, require the consideration of various issues specific to age and actual condition. The skin physiology of premature babies, the psychological impact of a wound on a child and the risk factors for pressure ulcers are some of the aspects to consider. This article suggests some basic principles for wound care in neonatology. Major paediatric centres now treat many low-birth-weight premature neonates (500–600 grams) after 24 or 25 weeks of pregnancy. It is imperative to understand certain characteristics of their skin physiology to avoid any harm to their fragile skin, even if the scarring process is similar to that of the adults.

Skin Physiology in the Premature Neonate

The skin of the low-birth-weight neonate is transparent, reddish and has a gelatinous appearance. The horny layer has few cell layers; moreover, the junction between the epidermis and the dermis is very fragile because of the immaturity of the anchorage structures. This lack of development of the horny layer causes a disturbance of the

skin's protective role in the premature neonate that manifests itself by high permeability,^{1,5} more significant trans-epidermic water losses,^{1,5} and increased sensitivity to infections.^{1,5,9} With respect to permeability, Harpin and Rutter's research has shown that in the premature neonate, topical products are absorbed, thus generating a risk of systemic toxicity.^{1,5,9} Therefore, to reduce trans-epidermic water losses, to protect the integrity of the horny layer and to improve the protective role of the skin, it is recommended that a softening ointment without a preservative be applied four times a day in neonates with a gestational age of less than 30 weeks.^{1,3,7,10}

It is also recommended that anyone in direct contact



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Soins des plaies en néonatalogie

Résumé

Les lésions cutanées observées dans la clientèle pédiatrique, bien que différentes de celles chez l'adulte, nécessitent la prise en considération de différents aspects propres à l'âge et au problème de santé présent. La physiologie cutanée du prématuré, l'impact psychologique d'une plaie chez l'enfant et les facteurs de risque de plaie de pression font partie des aspects à considérer. Cet article propose quelques principes

de base pour le soin des plaies en néonatalogie. Les grands centres pédiatriques traitent maintenant de nombreux nouveaux-nés prématurés de faible poids (500 à 600 grammes) à leur naissance après 24 ou 25 semaines de gestation. La connaissance de certaines caractéristiques de leur physiologie cutanée devient une nécessité pour éviter un préjudice à leur peau fragile et ce, même si le processus de cicatrisation est similaire à celui chez l'adulte.



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with this group use an adequate hand-washing technique to prevent infections. Furthermore, bathing is only recommended to clean dirty skin and not on a daily basis in the premature neonate.¹ The use of a mild soap or a pH-neutral cleansing agent is recommended to avoid jeopardizing the formation of the skin acid film.^{4,11} During a study completed in 1998, Lund et al showed that a skin maturation comparable to that of adults is reached by 30 to 32 weeks of gestational age, whatever the chronological age of the child.⁹

Types of Wounds Observed in the Premature Neonate

The following wounds have been observed in the low-birth-weight premature neonate:

- Tearing of the epithelium
- Pressure ulcers, friction and shearing
- Chemical or thermal burns
- Latex allergy
- Infiltration

However, the majority of these wounds can be avoided by taking into account the characteristics of the premature neonate skin.

Tearing of the Epithelium

It is recommended to reduce the use of adhesive products in the premature neonate. However, when it becomes necessary to use adhesive products, here is some advice:

- Apply a hydrocolloid dressing, ideally **thin**, as a base for the fixation of tubes, catheters and monitoring equipment. These dressings should stay in place for at least 24 hours to avoid trauma to the skin due to too frequent changes. The hydrocolloid dressings should be applied on skin surfaces unexposed to pressure. Clinical experience has enabled us to observe that this type of dressing, when applied to a surface exposed to pressure, for instance the back or the occiput, tends to melt and excessively adhere to the skin. One thing to remember is that the neonate is in an incubator or under a heat lamp, which can contribute to increased dressing adherence.
- Avoid the use of liquid or paste skin protection products in ostomate babies since these products usually contain alcohol. Ideally, digestive stomas must

be fitted and a solid skin protector should be applied under the collector apparatus, unless it is already part of the bag. Manufacturers now offer products adapted to premature neonates.

- Avoid the use of products that increase dressing adherence, such as glues, cements and gums. These products contain substances that can cross the skin barrier. They also create a stronger bond than usual between the epidermis and the dermis.
- Use products with micro-adherence and apply lukewarm water to remove the adhesives. The use of solvents is definitely not recommended because of the risk of toxicity.

Thermal Burns

First- and second-degree burns have been observed in premature neonates, caused by CO₂, PCO₂ and SO₂ sensors. As a preventive measure, it is recommended to change the sensor locations every two hours and set them at the lowest temperature.^{1,9} The use of silver sulfadiazine, the traditional treatment for burns, is not recommended in this group because this product contains substances that can cross the skin barrier and cause harmful side effects. Incidentally, the use of this product is not recommended during the first month of life, even in the full-term neonate.²

When the therapeutic option is hydrogel because of the skin permeability in the premature neonate, its actual composition must be checked because some contain unwanted substances (e.g., propylene glycol). Also, the use of hydrogel requires the application of a secondary dressing, which is not always desirable. The one-step procedures are preferable, such as the application of a thin hydrocolloid dressing. This type of dressing promotes a moist environment while not impeding the child's movements.

Chemical Burns

Some techniques, such as the installation of an umbilical catheter, require the use of irritant disinfectant products. After the procedure, it is important to thoroughly rinse the skin to avoid any risk of chemical burn. This type of burn, often located on the back of the neonate, is usually treated with a micro-adherence perforated silicone gel dressing rather than a hydrocolloid dressing since this surface is

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exposed to pressure. The perforated silicone dressing provides some humidity to the wound while not causing any trauma during its removal.

Pressure Ulcers, Friction and Shearing

For the treatment of pressure ulcers, mostly located at the occiput, it is recommended to shave the area to properly visualize the extent of the damage to the skin integrity. Once again, clinical practice has confirmed that it is better not to use hydrocolloid dressing on pressure ulcers at the occiput, for the reasons mentioned earlier. The use of a micro-adherence silicone foam dressing combined with a gel free of toxic products promotes a moist environ-



ment. It also reduces the size of the area that has to be shaved, since the removal of the dressing does not cause the tearing of the hairs surrounding the wound. Wounds by friction and shearing have been observed on the neonate's lower extremities. Most often these lesions are due to massages performed during micro-method blood samplings done at the heels (see photo at left). As a preventive measure, it is recommended

to vary the puncture sites and apply strips of thin hydrocolloid dressing to prevent and treat these lesions.¹

Latex Allergy

The use of a latex-containing product may cause skin lesions in the premature neonate. Health providers are increasingly aware of this type of allergy and avoid the use of any latex-containing product.

Infiltration

Solutes sometimes infiltrate despite the use of best techniques. As a preventive measure, vascular accesses are checked every hour and the infusion is stopped at the first sign of infiltration. Some products such as hyaluronidase and phentolamine, given by subcutaneous injections within hours after the infiltration, promote the diffusion of harmful substances, thereby limiting subsequent skin damage.¹

Conclusion

Successful intervention with premature neonates requires taking into account the characteristics of their skin physiology. Before applying any topical product on a neonate's skin, it is best to check its exact composition with the manufacturer and find out their recommendations for use in neonatology. As often as not, premature neonate wounds heal rapidly, but as with adults, prevention always remains the best treatment. ☺

This article was modified from: Forest-Lalande L. Helpful hints in neonatology wound care. *Primary Intention*. 2001;9(1), and printed with permission.

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