

# Cyanoacrylates\* in Neonatal and Infants Peristomal Skin Damage

**ABSTRACT**

**Introduction:** Peristomal skin damage in neonates and infants is an all too common occurrence, and such damage to skin can lead to further complications and morbidity. Given the fragility of the infant or neonatal skin, which is still not fully developed at birth, the clinician's options in terms of choosing a skin protectant are very limited. Denuded skin prevents containment devices from adhering. Skin preps that contain solvents carry associated inhalation and fire hazard risks in a neonatal environment. A relatively new class of materials, cyanoacrylates, is applied solvent-free to the skin, and forms a non-adhesive polymer barrier very quickly. The formation of such film allows relief to the peristomal skin, protects underlying skin from further damage caused by leaking gastric contents or stoma effluent, and allows the skin to recover its natural health. It also provides a robust platform for the attachment of a collection device.

**Intervention:** A cyanoacrylate barrier was applied to infants and neonates with peristomal skin damage in gastrostomy and ostomy patients in an effort to recover denuded skin and, in the case of ostomy patients, increase wear-time of the appliance.

**Results:** Appliance wear-time was increased for neonatal and infant patients with ostomies. Skin condition improved, and none of the patients developed an adverse reaction to the cyanoacrylate during their stay in the hospital. In previous experience this type of skin breakdown has been difficult to manage.

**COMMON MANAGEMENT OF NEONATAL SKIN DAMAGE**

Infants and children have very sensitive skin. In our practice we frequently encounter severe cases of skin breakdown due to a number of issues. Contributing factors include 1) frequent loose stools, 2) leakage of acidic gastric contents from gastrostomy tubes, and 3) harsh enzymatic effluent from an ileostomy. Additionally, denuded skin prevents proper adherence of ostomy pouches requiring frequent pouch changes and additional breakdown of skin. Alternatively a barrier cream may be used over the damaged skin, and the child double-diapered with consequent frequent diaper changes. We have used numerous products in the past to help protect and heal denuded skin with varying degrees of success and have felt that a more robust skin protectant could have a special role in the management of particularly challenging neonatal skin issues.

**Case 1**

7 week old born at 25 weeks gestation  
Stoma opening at skin level 3:00



4-9-2010



4-13-2010

Skin appears purple and wrinkled from the cyanoacrylate application but the disappearance of erythema is clearly visible.

4-15-2010

The erythema and skin breakdown were totally resolved. The cyanoacrylate barrier was applied to the patient on an as needed basis for the following month long stay of the child in the unit.



5-10-2010

**Case 2**

22 month old, 31 week gestation



11-25-2009



11-27-2009

**Case 3**

17 month old – Necrotizing enterocolitis



12-9-2010

The mother of the patient stated that she was unable to keep a pouch on the patient. Cyanoacrylate protectant was applied and the pouch placed around the stoma. The pouch stayed in place 10 hours, and then developed some leaking. At this point the pouch was removed, the skin cleansed with water and dried. Cyanoacrylate protectant was reapplied and patient was double-diapered. Frequent diaper changes were required throughout the night. The skin was seen to be much improved and pink in color in the morning. The cyanoacrylate barrier was intact on the skin and patient was discharged home.

#### Case 4

14 month old prior gastroschisis patient



1-20-2010



1-21-2010

#### Case 5

Very visible denudement of skin on the buttocks of a child was managed with the application of a cyanoacrylate barrier. The condition of the reddened skin improved and normalcy was restored within a week.



12-6-2010



12-13-2010

#### Case 6

10 month old baby with influenza



2-14-2011



12-15-2011

"Crusted on" cyanoacrylate barrier, with clearly improved underlying skin with the redness not apparent, within a day of skin management with the cyanoacrylate

#### TECHNOLOGICALLY ADVANCED MANAGEMENT OF NEONATAL SKIN DAMAGE

Recently we have begun applying a cyanoacrylate skin protectant to cover and protect the skin from further damage from external elements as it heals naturally. We chose for this case series a set of patients whose skin required urgent management due to the severity of the underlying cause and/or the failures of standard methods we had at our disposal for skin protection. The type of cyanoacrylate we used is a non-cytotoxic liquid skin barrier.

#### OBSERVATIONAL RESULTS

We found that the cyanoacrylate protectant dried within about one minute of application and formed a flexible "crust" over the denuded skin. As the skin regenerated naturally underneath the crust, the product sloughed off in course of time without further intervention. Newer layers of the barrier could be applied to the older partially adherent layers with no ill effects. Once in place and dry, the product allowed for wafers to be placed, in order to allow uninterrupted containment of the sometimes corrosive effluent. We found that use of the cyanoacrylate skin protectant provided the needed protection which allowed our patients' highly denuded skin to resolve in a shorter period of time. We saw no adverse effects from the use of the product in infants or children. During application, we noticed no distress on the patients and the parents reported no concerns about the product use. Based on this, it appears to us that the product likely does not sting on skin that is damaged. The application method via the cracking of unit dose vials was easy and the quantity of product quite sufficient for use on our little patients. The absence of solvents was appreciated by us.

**Conclusion:** It is remarkable the speed at which the skin issues were resolved after providing robust external protection. It is apparent in these case reports that neonatal skin may regenerate rapidly as long as there is no continuing insult to the already damaged skin from external elements such as corrosive bodily fluids.

\* Marathon®, Medline Industries Inc., Mundelein, IL.

#### REFERENCES

Milne CT, Saucier D, Trevellini C, Smith J. Evaluation of a Cyanoacrylate Protectant to Manage Peristomal Skin Irritation Under Ostomy Skin Barrier Wafers. Presented at: Clinical Symposium on Advanced Skin and Wound Care, Orlando, FL, 2010.