The Use of Cyanoacrylate* Skin Prep to Manage Skin Damage in the NICU

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INTRODUCTION
Infants in a neonatal intensive care unit present many unique challenges. Many of these infants present with necrotizing enterocolitis or bowel perforation requiring lower abdominal surgery and are often intubated. The fragile nature of the neonatal infant’s skin makes healing after abdominal surgery a particularly difficult challenge, especially as intra-abdominal pressures change with positive pressure ventilation. Incontinence issues also disrupt the premature infants’ skin integrity. The buttock region is a common area susceptible to skin denudation. Skin stabilization and protection around the surgical or denuded site is essential for proper wound healing.

METHODS
Cyanoacrylates are a class of compounds that bond to the skin at a molecular level, allowing for a robust yet flexible skin protection. Previous research has shown that when applied to damaged skin, their use may enable the return of skin to normal health through the body’s own reparative processes. Preventing damage from external elements, such as urine, digestive, or fecal matter will help the natural repair process.

CASE PRESENTATIONS
Case 1: JJ is a 23 5/7 week old female that weighted 490 g at birth (now 38 wk 3245 grams) and developed a bowel perforation and underwent a subsequent ileostomy procedure. Traditional methods to ensure skin integrity were used until her incision dehisced. The cyanoacrylate based skin barrier was used around the surgical site to stabilize the skin and prevent further skin integrity loss from frequent dressing changes and around ileostomy site. After approximately one month of use, the surgical wound site and surrounding skin were closed.

Case 2: DP is 30 1/7 week old female (2080 g) that presented with a bowel perforation, amniotic band syndrome and congenital syphilis. Pt has an ileostomy and a mucus fistula. Due to transverse dehiscence, loose stools and frequent dressing changes, a cyanoacrylate based skin barrier was then used. After approximately three weeks of use, the surgical wound site and surrounding skin were closed and epithelializing.

Case 3: SP is a 34 3/7 week old female (2177 g) presented with respiratory depression secondary to maternal morphine use. The infant developed a diaper rash from frequent loose stools that progressively worsened over the next 8 days. The cyanoacrylate based skin barrier was applied to the denuded area. Four days later, the infant was discharged home, and the denuded area was resolved.

Case 4: DR is a 27 6/7 week old male who weighed 710 g at birth, presented with severe Intrauterine growth restriction (IUGR) and developed a blister behind his right ear that ruptured. Cyanoacrylate was applied to the back of DR’s ear and naturally fell off about 6 days later with evidence of healed skin.

Case 5: CM is a 4195 g 45 6/7 week old male that developed a reddened diaper rash from frequent loose stools which progressively worsened over the next 5 days. The fragile skin on his buttocks became denuded and the cyanoacrylate was applied. Within three days, the healing was complete.

CONCLUSION
We believe a product that bonds to skin as strongly as the cyanoacrylate should become the part of a formulary in any neonatal unit such as ours, where we often deal with highly compromised skin that the usual class of skin protectants cannot protect or manage. This is a new class of protectants different from solvent based skin protectants and petrolatum based barrier ointments.

*Marathon® Skin Protectant.

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