

INTRODUCTION

- Level IV Neonatal Intensive Care Unit (NICU) expanding from 18 to 32 beds
- Formerly a predominantly surgical NICU
 - Increasing affiliations to care for more premature infants and for longer periods of time
- Addition of Advanced Delivery Unit
- Bundle practices to prevent hospital acquired infections (HAIs) require frequent bathing
 - < 32 weeks gestation – sterile water only every 3-4 days
 - 32-40 weeks gestation – soap and water every 2-3 days
 - 40-48 weeks gestation with central line – soap and water every day
 - > 48 weeks gestation with central line – daily chlorhexidine gluconate (CHG) bath daily, soap and water every 2-3 days
- Utilized research and trials of proposed products based on bathing and skin care guidelines

PROBLEM STATEMENT

- High population receiving daily soap and water baths
- Hospital provided wipes not appropriate for all NICU patients
- Diaper dermatitis, frequent use of diaper protocol (zinc oxide, skin barrier and stoma powder)
- Also, growing premature patient population requiring different skin care options

Table 1: Contents of Hospital and Proposed Products

Hospital-issued Baby Soap	Proposed No-rinse Foam Soap	Hospital Diaper Wipes
PEG-80 sorbitan laurate: A surfactant, with high allergy risk and high chance to be contaminated with ethylene oxide (human carcinogen)	Sodium laureth sulfate: surfactant, high contamination concerns, high skin irritability concerns, moderate organ toxicity	Caprylic/capric triglyceride: Expected to be an environmental toxin
Phenoxyethanol: preservative, classified as harmful in Europe, potential organ system toxicity	Phenoxyethanol: dyes, fragrances and ethylhexylglycerin	Phenoxyethanol
Ethylhexylglycerin: weak preservative, skin conditioning agent, highly irritable to skin, moderate concerns for organ system toxicity	Dmdm hydantoin: antimicrobial formaldehyde releasing agent, human skin toxicant and allergen, high toxicity and irritation concerns, high chemical release concerns, preservative	Bis-PEG/PPG-20/20 dimethicone: Contamination concern with 1,4-dioxane Human respiratory toxicant, possible carcinogen
Other Fragrances and additives	Propylene glycol: small organic alcohol commonly used as a skin conditioning agent; associated with irritant and allergic contact dermatitis as well as contact urticaria in humans; these sensitization effects can be manifested at propylene glycol concentrations as low as 2%.	Benzalkonium chloride: Skin toxicant and allergen, Respiratory toxicant and allergen
	Methylparaben: Preservative, high concern for endocrine disruption, moderate concern for biochemical or cellular level changes	
	Peg-12 dimethicone: A Surfactant, High contamination concerns, High skin irritability concerns, Moderate organ toxicity	

PROJECT PLANNING

- NICU Products/Value Analysis Council researched different soaps and diaper wipes available to the NICU
- Collaborated with other NICU RNs at conferences to assess current product usage
- Utilized evidence to review what options were available
- Chose baby wash, lotion and diaper balm products that prior to November 2018, only made available to NICUs
 - Ingredients listed as 'Natural,' 'Organic' or 'Plant-based'
 - Formulated without fragrances, parabens, dye, paraffin, silicone, soy, dairy, and gluten
 - Packaging is BPA-free
 - Developed specifically for newborn skin
- Diaper wipes chosen for minimal ingredients and estimation that usage would be 1/3 less than existing product
 - Made using 99.9% purified water
- Once decision was made, petitioned Value Analysis Taskforce (VAT) to trial organic products and diaper wipes
- Data presented to VAT
 - Single use (infection control friendly)
 - No harmful chemicals
 - Protection of skin integrity
 - Wipes with no additives, potential to decrease diaper dermatitis and need for diaper protocol use

PROJECT IMPLEMENTATION

- Tried proposed products for 2 weeks based on unit's current bathing and skin care guidelines
 - Staff educated on trial products and recommended usage
 - Trial included baby wash, lotion, diaper balm, and new diaper wipes
 - Tracked previous diaper dermatitis
 - Monitored for signs of skin irritation or breakdown
 - Requested bedside nursing to complete product evaluations



OUTCOME

- Immediate positive parent response
 - Natural options were favored
 - Happy to have an alternative to use
- Positive staff response
 - Control over neonatal skin protection
 - Education on needed product change helped staff to enhance their skin care practices and knowledge base
- Diaper dermatitis at start of trial cleared up within a few days
- Once trial was complete, presented data and evaluations to VAT
- VAT, along with NICU nursing leadership and medical team, gave final approval to purchase new products
 - Previously supplied soaps and wipes removed from NICU stock
- No signs of skin irritation or breakdown from soap and lotion
- When diaper balm is used prophylactically with wipes, diaper dermatitis has been eliminated, as well as need for diaper protocol

FUTURE RECOMMENDATIONS

- Further review of unit skin care guidelines
 - Specifically for infant's < 28 weeks gestation
 - And infants > 48 weeks corrected age
- Hospital-wide review of wipes and skin care products for infants in all units throughout organization
- Continued review of better skin care protocols for neonates
- Development of Standard of Care/Policy based on protecting skin, one of the seven core measures of Neuroprotective Family Centered Developmental Care



RECOMMENDED READINGS

1. Altier, L., & Phillips, R. (2016). The neonatal integrative developmental care model: advanced clinical applications of the seven core measures for neuroprotective family-centered developmental care. *Newborn and Infant Nursing Reviews*, 16(4), 230–244. doi: 10.1053/j.nainr.2016.09.030
2. Amer, M., Diab, N., Soliman, M. & Amer, A. (2017). Neonatal skin care: what should we do? A four-week follow-up randomized controlled trial at Zagazig University Hospitals *International Journal of Dermatology*, 56(11), 1198-1203. doi:10.1111/ijd.13735
3. Burdall, O., Willgress, L. & Goad, N. (2019). Neonatal skin care: developments in care to maintain neonatal barrier function and prevention of diaper dermatitis *Pediatric Dermatology*, 36(1), 31-35. doi:10.1111/pde.13714
4. EWG Skin Deep® Cosmetics Database. (n.d.). Retrieved from <https://www.ewg.org/skindeep/>
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6. Kuller, J. M. (2016). Infant skin care products. *Advances in Neonatal Care*, 16. doi: 10.1097/anc.0000000000000341