Prevention and Treatment of Neonatal Hospital Acquired Pressure Injuries

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May 25, 2011
Objectives

• Review anatomy of skin including differences in neonatal skin
• Review contributing factors of pressure injuries in neonates
• Discuss Staging of pressure ulcers
• Discuss Neonatal skin team plans
Let’s talk about skin…

• Largest organ in the body!
• Ever changing organ containing many specialized structures.
Why is skin so important?

- Protective Barrier
- Temperature Regulation
- Active Role in Immune System
- Sense of Touch
Quick Review Anatomy of Skin

Three Layers:

- Epidermis
- Dermis
- Subcutaneous
Variations in neonatal skin

- Underdevelopment of the Stratum Corneum
- Decreased cohesion between Epidermis and Dermis
- Dermal instability
- Skin surface pH
Neonatal Skin

- Fibrils connect the epidermis and dermis
- More widely spaced and fewer.
- Diminished cohesion leaves the neonate MORE susceptible to injury from adhesive removal
Additional Neonatal Considerations...

- Stratum corneum is thinner in newborns. Especially the PREEMIES!
- Increased susceptibility to infection, toxicity from topically applied substances
- Neonates may also have excessive evaporative heat and fluid losses
Even More Neonatal Concerns...

- Dermis of the full-term newborn is only 60% as thick as adult dermis
- Deficient in collagen
- Vulnerable to injury
Pressure Ulcers are a NEVER-EVENT

- Hospital acquired pressure ulcers (HAPU) have been classified as a NEVER-EVENT.
- Never-Events are hospital associated problems that occur in the hospital/institutional setting that can be prevented
- Never-Events will not be reimbursed by insurance companies
- Worse, Never-Events must be reported, and can lead to mistrust by the general public
Never-Event

- Center for Medicare and Medicaid Services (CMS) has declared Pressure Ulcers to be a “never event”.
- Chosen as “never event” because of the financial burden.
- Cost to heal a single full thickness pressure ulcer may be as high as $40,000.
- Hospital Acquired pressure injuries may not be covered, the hospital will have to absorb the cost of these injuries.
What is a Pressure Ulcer?

Localized areas of tissue destruction that develop when soft tissue is compressed between a bony prominence and external surface for a prolonged period of time.
Pressure ulcer prevention

• Among neonates and children, 50% of pressure ulcers are equipment and device related (i.e. nasal prongs, CPAP masks, tubings and lines)

• Most pressure ulcers are preventable

• Two major steps for preventing pressure ulcers: identify patient at risk and implementing prevention strategies for “at risk” patients
Risk assessment tools

- Braden Q
- NSRAS
- Glamorgan scale
- Starkid Skin Scale

*Risk tools that are available and being used, but no agreement on which if any of these are accurate indicators of patient risk of developing pressure injuries.*
Risk factors for neonatal skin breakdown

• Gestation of less than 32 weeks
• Edema
• Use of Paralytic agents or vasopressors
• Use of devices: ET tubes, NCPAP, NG tubes, probes and monitors
• High frequency ventilators
• ECMO
• Surgical wounds
• Ostomies
Pressure ulcers in neonates

• Acutely ill and immobilized neonates are at risk for pressure injuries.
• Pressure ulcer prevalence rates of 23% have been reported in Neonatal Intensive Care Units.
Factors contributing to pressure ulcers:

1. Pressure
2. Shear
3. Friction
4. Moisture/incontinence
5. Device related pressure
6. Immobility
7. Inactivity
8. Nutritional deficits
Pressure Injuries

• Adults Pressure injuries occur over the sacrum, the largest bony area

• Neonates and pediatric patients, the occiput is the largest bony prominence and most common site of pressure ulcer development
Medical Devices Cause Areas of Pressure in Neonates

- O2 sat monitor probes-on fingers and toes
- NCPAP device cause tissue damage to nasal structures
- Tracheotomy Ties-on the neck
- Tracheotomy flange-on the anterior neck
- Lying on Tubing or Caps in the bed
- Oxygen tubing on nares and ears
Staging Pressure ulcers
Stages of Pressure Ulcers

- Suspected Deep Tissue Injury
- Stages I-IV Pressure Ulcer
- Unstageable Pressure Ulcers
Pressure Ulcer Staging

Stage I Pressure Ulcer

- Intact skin with non-blanchable redness of a localized area, usually over a bony prominence

- Darkly pigmented skin may not have visible blanching; its color may differ from surrounding area

- Reversible
Pressure Ulcer Staging

Stage II Pressure Ulcer

- Partial thickness loss of dermis presenting as a shallow open ulcer with red/pink wound bed, without slough

- May also present as an intact or open/ruptured serum-filled blister
Pressure Ulcer Staging
Stage III Pressure Ulcer

- Full thickness tissue loss

- Subcutaneous fat may be visible, but bone, tendon or muscle are not exposed

- Slough may be present but does not obscure the depth of tissue loss
Pressure Ulcer Staging
Stage IV Pressure Ulcer

• Full thickness tissue loss with exposed bone, tendon or muscle

• Slough or eschar may be present on some parts of the wound bed

• Often includes undermining and tunneling
Pressure Ulcer Staging

**Suspected Deep Tissue Injury**

Purple or maroon localized area of discolored skin due to damage of underlying soft tissue from pressure. Area may be preceded by tissue that is painful, firm, mushy, boggy, warmer or cooler as compared to adjacent tissue.
Pressure Ulcer Staging

Unstageable Pressure Ulcer

• Full thickness tissue loss
• Base of the ulcer is covered by slough (yellow, tan, gray, green or brown)
• And/or eschar (tan, brown or black) in the wound bed.
Two most common causes of Neonatal Pressure injuries

1. Immobility
2. Devices
Immobility
Immobility

Suspected Deep Tissue Injury Progression

Same patient one week later.
Immobility and Device

Stage III Pressure Ulcer

Injury from a Blanket Roll used to position head for intubation.
Device injury
Device injury

Stage II Pressure Ulcer

Injury from a Pulse Ox Probe.
Device pressure injury

- Stage II pressure injury
- Caused by ID band too tight
- Loss of epidermis
Device Pressure Injury

- Infant with injury from lying on tubing
- Suspected deep tissue injury
Treatment of Pressure Ulcers

• Relieving pressure or redistributing pressure
• Adequate nutrition for wound healing
• Managing incontinence
• Wound management strategies
Relieving pressure

- Repositioning and turning frequently
- Using positioning devices
- Check for devices being too tight or under patient (ID bands, IV hubs, tubing under patient)
- Removing devices at regular intervals:
  - O2 sat probes
  - NCPAP prongs and hats
  - Splints
Adequate Nutrition

• Nutrition plays an important role in prevention of skin breakdown and in wound healing
• Premature infants have greater nutritional requirements
• Patients should have a nutritional consult to guide in adequate nutritional requirements
Managing Incontinence in neonates

- Frequent diaper change
- Cleanse diaper area using soft cloth and water
- Use of barrier cream to protect skin from injury
- Treat skin excoriation from diaper dermatitis
- Identify complications such as Candida which would need to be treated with antifungal
Wound Management Strategies

- Relieve or minimize pressure
- Assess wound for infection and need for debridement
- Type of dressing for wound: (foam, hydrocolloid, Hydrogel, silicone, etc)
- Pain management
NCPAP

• Improved technology such as NCPAP has decreased complications associated with endotracheal intubation in ELBW infants.

• Immature skin and developing nasal structures has increased risk of injury in these ELBW infants.
Nasal CPAP

- Two Types of nasal CPAP
- Devices that can cause injury to nasal area, cheeks and forehead
Device injuries
Nasal pressure injury from NCPAP
Complications due to nasal injuries

- Irritation of nasal lining, recurrent sinus infections
- Nasal septum deviation, leading to obstruction of nasal passages
- Nasal cartilage necrosis leading to nasal collapse or stenosis
- Abrasion of the cartilage may alter shape of the nose
Complications of Nasal CPAP

- Columellar transection
- Columellar notch
Key steps to prevent patient harm

- Overall organizational goal of zero preventable harm
- House wide Pressure Ulcer Prevention team, multidisciplinary with key Leadership involvement
- Report stage II and greater pressure injuries to our Preventable harm index
- Quarterly house wide prevalence
How to get to Zero

• Data analysis to identify areas of highest prevalence
• Begin focus in these areas with more frequent assessment with rounding and data collection
• Provide education and prevention strategies
• Accountability of staff to utilize prevention techniques and accurate reporting of injuries
Neonatal Services focus on preventing and treating pressure injuries

Step one:

• Educate staff regarding identifying pressure injuries
• Proper reporting of injuries
• Proper staging and documentation of pressure injuries
Step Two:

Units need to form their skin care teams:

- Wound Care Team
- NICU Nursing Staff
- NNP
- Nutrition Team
- Educator
- QI
- Others that would be appropriate
- Respiratory care
Role of unit skin care team

• Form plan to do patient rounds to assess patients and collect data
• Analyze data to decide if there needs to be changes in practice
• Teams need to continue to provide education to staff regarding prevention and treatment of pressure injuries
What to do if I find a pressure injury?

• Document the injury in patient’s chart
• Consult Wound nurse if Stage II or greater
• Report the injury in the ERS
Documentation of Pressure injury

• Location of injury: specific body location
• Stage of injury
• Measurement of wound in metric, length x width x depth of wound
• Wound tissue appearance (granulation tissue, pink clean tissue, necrotic tissue etc)
• Drainage: amount and color
• Dressing and care performed
Goal of Zero Harm: From the NICU to home
References


