

Heat Loss Prevention in Very Low Birth Weight Infants

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Objectives

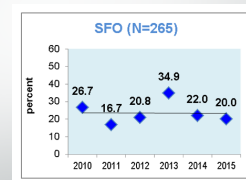
- Upon completion of this lecture, the learner will be able to:
 - Define potential outcomes for the VLBW infant with hypothermia
 - Describe methods and degrees of heat loss
 - Identify interventions to prevent heat loss in the VLBW infant

Outcomes

- Admission temperatures below 36°C are associated with increased mortality and late onset sepsis
- For each 1°C decrease in admission temperature below 36°C
 - 28% increase in mortality
 - 11% increase in LOS
- Moderate hypothermia in VLBW infants also associated with
 - Persistent Pulmonary Hypertension (PPHN)
 - Moderate to severe Bronchopulmonary Dysplasia (BPD)
 - Intraventricular Hemorrhage (IVH)

Our QI Project

- 22 bed Level 3 NICU
- Approximately 45 VLBW infant admissions per year
 - VLBW defined as < 32 weeks and/or < 1500 grams
- Between 2010 and 2015, our hypothermia rates (admit temp < 36.0°C) ranged anywhere between 16.7 to 34.9%



Our Goal

- In Fall of 2015 we set our goal:
 - To decrease our hypothermia rate in our VLBW infants by at least 50%
 - Goal admission temperature = axillary temperature between 36.5°C to 37.5 °C within the first hour of admission to our ICN

Obstacles to Achieving Success

- Inadequate staff education and buy-in
- Cold Operating Rooms/Resuscitation Room (set as low as 65 degrees!)
- Reaching agreement with OB team on set temperatures in OR
- Distance from OR to ICN
 - about 500 feet, several turns and through 4 sets of doors
- Proper documentation/lack of documentation of temperatures

Brief Timeline of Events

- 10/2015:
 - Developed staff checklist (ensure use of porta warmer mattress, NeoWrap, Giraffe Shuttle)
 - Identified RN barriers to success
 - Staff education on use of equipment and products
- 11/2015: Agreement with Obstetricians - OR temp locked in at 74 degrees
- 2/2016: I/CN Staff Skills Days Training – code simulation included VLBW infants and emphasis on heat loss prevention
- 5/2016: added polyethylene lined thermal hat
- 6/2016: changed to Trans Warmer Infant Transport Mattress (previous squeeze activation mattress difficult to activate)
- 5/2017: OB concern that OR too warm, possibly contributing to surgical site infections, so OR temps now decreased and locked at 72 degrees

Prevention strategies

- Approaching all angles of potential heat loss and ensuring we are doing everything possible to prevent heat loss - Heat Loss Prevention Bundle
- Prevent Conductive Heat Loss
- Prevent Convective Heat Loss
- Prevent Radiant Heat Loss
- Prevent Evaporative Heat Loss
- Checklist and standardization of care

Prevent Conductive Heat Loss

- Pre-warm Giraffe Isolette, specific beds designated as VLBW Admission Beds
- Portable warming mattress
 - TransWarmer Mattress
 - Easy to activate and maintains heat of 104°C for up to two hours
- Polyethylene lined hat



Prevent Convective Heat Loss

- Maintain a constant heated operating room and resuscitation room
 - 72°F degrees in OR
 - 74°F degrees in Resuscitation Room
- Use of polyethylene wrap around baby
 - Without drying, wrap baby with the plastic wrap or place them in a bag
- Place a polyethylene lined hat onto baby's head
- Minimize traffic around resuscitation bed with "Red Tape" area for NICU Team only

Prevent Convective Heat Loss (cont.)

- Resuscitate on the same bed that the baby will be transported on and then admitted in, avoiding transferring of baby from one bed to another.
 - Use of Giraffe Shuttle to transport
- Use of warm humidified oxygen during transport when possible (i.e. transporting on bubble CPAP)



Prevent Evaporative Heat Loss


- Use of polyethylene wrap and lined hat
- Heated and humidified oxygen during transport
- Start humidity as soon as possible





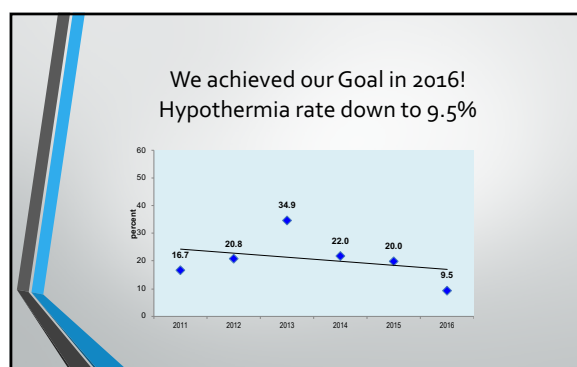
Prevent Radiant Heat Loss

- Designated Admit Giraffe Isolette
- Use of servo-control



Successes!

- Standardized care
- Multidisciplinary team approach
- Real-time evaluations and feedback
- Ongoing staff education
- Updated products



Preliminary Data for 2017

- For 2017 our goal was to decrease hypothermia rates by another 50%
- So far we have achieved that goal:
 - 33 babies born so far this year
 - 1 baby with low temp < 36.5
 - Hypothermia rate so far is 3% for this year!

Questions/Comments?

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References

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