

Clinical Practice Guideline: NeoBellyBand™

Rationale

The abdominal wall is an important part of the cardiopulmonary (CP) system, gastrointestinal (GI) system and musculoskeletal (MS) system. When abdominal wall integrity and/or thoracic cage stability is compromised, the physiologic function of the abdominal wall muscles is suboptimal. Abdominal muscle integrity and the interaction of the rib cage and abdominal wall musculature may be impaired in premature infants by continuous positive airway pressure (CPAP) or other forms of non-invasive positive pressure respiratory support when it causes gaseous abdominal distension, commonly known as “CPAP Belly”. Gaseous distension in the GI system can inhibit respiration. Neonates may also have rib cage flexibility either due to prematurity or anatomical anomalies such as prune belly or pectus excavatum. Support for abdominal muscle integrity may be of benefit to abdominal wall function and optimize the physiologic functions it supports. Infants treated in case studies have experienced improved comfort, decreased constipation and optimization of respiratory course.

Safety considerations and criteria

Preterm infants have known risk for conditions including cardiopulmonary instability, necrotizing enterocolitis (NEC), loss of skin integrity, and postural impairment of the musculoskeletal system. A balance of risk and benefit is always a necessary consideration when treating these fragile infants.

Indications for use: The belly band is a soft, flexible abdominal support used for premature infants with issues for abdominal wall integrity. This is commonly experienced due to gaseous abdominal distension from non-invasive positive pressure respiratory support (NIPPV or CPAP). Gaseous abdominal distension is considered greater than normal limits if the ratio of abdominal circumference (AC) to head circumference (HC) falls outside one standard deviation from the mean on norms established in Setruk 2020⁴

Safety criteria to ensure typical GI function and skin integrity prior to initiating wear include:

- At least 7 days old without skin integrity issues on their trunk.
- Neonates who have a history of stooling appropriately and normal bowel gas pattern on x-ray.
- Have achieved 120ml/kg of feeds for 24 hours without concerns for GI function.

Other considerations:

- If the umbilical stump is still in place, a piece of Mepilex foam can be placed under it to protect the surrounding skin.
- The band is recommended to be worn continuously when on positive pressure support. Skin checks should occur at each diaper change. It can be worn during skin to skin holding.
- The band may be started preventatively when safety criteria met or when abdominal circumference is above 75th percentile on normative graphs.
- Wear schedule can decrease to half time when weaning from positive pressure support and/or when using for other abdominal integrity issues.

Application: The belly band is cut to fit by OT or PT based on the infant's abdominal circumference and torso length.

- The band should be taut but not tight, with the top border at the xiphoid process and bottom border at the uppermost hip points in the front of the pelvis. (See picture below.)
- Velcro closure with some overlap of material underneath to be sure Velcro is not directly on the skin.
- Minimizing leads under the band is recommended.
- An extra band will be at the bedside, if the band becomes soiled, it can be washed at the bedside and hung to dry. If too soiled for washing, it should be discarded, and another requested from OT or PT.
- Head circumference can be obtained from the weekly measurement taken by nursing on Sunday night. Abdominal circumference is measured 1cm above the umbilicus on an exhale with nightly weight.

Discontinuation: Once a baby transitions off CPAP or NIPPV, the band will be weaned to half time wear.

- The length of weaning will be based on the infant's continued need for respiratory support and individual AC.
- If the infant has concerns with skin integrity or GI function the band should be put on hold until consultation with LIP and OT or PT can occur.

References:

1. Lemyre B, Davis PG, et al. Nasal intermittent positive pressure ventilation (NIPPV) versus nasal continuous positive airway pressure (NCPAP) for preterm neonates after extubation. *Cochrane Database Syst Rev.* 2017;2(2):CD003212. doi: 10.1002/14651858.CD003212.pub3. Update in: *Cochrane Database Syst Rev.* 2023;7:CD003212. PMID: 28146296; PMCID: PMC6464652.
2. McGill V. Neonatal abdominal support to address CPAP belly: two cases report and literature review. *J Neonatal Perinatal Med.* 2022;15(4):831-836. doi: 10.3233/NPM-221047. PMID: 36031911.
3. Kim J. <https://www.medela.us/breastfeeding-professionals/blog/blowing-up-the-cpap-belly-myth>. Accessed on 7/14/2023.
4. Setruk H, Nogué E, et al. Reference Values for Abdominal Circumference in Premature Infants. *Front Pediatr.* 2020;8:37. doi: 10.3389/fped.2020.00037. PMID: 32117842; PMCID: PMC7033386.

