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Office of Technology Management - The Pennsylvania State University
113 Technology Center, University Park, PA 16802
814.865.6277 phone; 814.865.3591 fax

Non-Confidential Description - PSU No. 4102
"Neonatal Chest Splint for Applying Negative Distending Pressure"

Field of Invention/Keywords:

Ventilation, Noninvasive, Chest Brace/splint, Neonatal, Hug n Puff

Inventors:

Charles Palmer

Background

Premature infants with respiratory distress have stiff lungs and a compliant chest wall. The soft rib cage and compliant chest wall in neonates can result in the chest wall readily collapsing during spontaneous respiration. Further, neonates often have to do extra work in breathing to overcome the chest wall retraction, and the lack of chest wall rigidity allows the lung to collapse. A collapsed lung is more difficult for the neonate to inflate. Therefore, premature infants often require assistance to maintain adequate lung volumes.

Invention Description

This invention assists neonates, and other patients who have difficulty breathing, by providing mechanical ventilation. More specifically ventilation is assisted using a chest splint device which includes a flexible cuff releasably attached to the patient's chest & back, & when inflated, a portion of the cuff is extended, thereby applying negative distending pressure to the patient's chest.

Advantages

- Satisfies the need for noninvasive application of negative distending pressure to a patient in need of respiratory assistance, for the purposes of:
    1. stabilizing the chest wall, preventing chest wall retractions and collapse of the lung, and
    2. Providing active negative pressure ventilation.
- Saves health care costs and improves patient outcomes by avoiding problems created by many different types of existing ventilation devices:
    1. CPAP can have major side-effects, such as airway drying, obstruction of nasal passages, and the erosion of the nasal septum from pressure necrosis.
    2. Even when positive distending pressure is applied non-invasively, i.e., without endotracheal intubation, it fails to support spontaneous respiration in 30-50% of preterm infants with respiratory distress.
    3. Mechanical ventilation via an endotracheal tube is associated with injury to the lung and chronic lung disease.

Status

PCT Patent Application #PCT/US2015/024472- filed 4/6/2015

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Contact: **David Sadowski**
Sr. Technology Licensing Officer
The Pennsylvania State University
Office of Technology Development
Penn State Hershey Campus

Phone: (717) 531-4629
Fax: (717) 531
E-mail: dsdowski@hmc.psu.edu