Invasive and Non-Invasive Ventilation For Preterm Infants.

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"What are the effects of invasive and non-invasive ventilation on the respiratory systems of preterm infants?"

Introduction:

Around the world each year 15 million babies are born preterm, and 1.1 million of these babies die due to complications of preterm birth. Preterm is defined as an infant born alive before 37 weeks gestational age (Ministry of Health, 2012).

The transition from in utero to extra-uterine life is one that involves many changes to an infants' body systems, this proves more difficult for preterm infants who have immature body systems, in particular their respiratory systems (Garg & Sinha, 2010).

These infants may require mechanical ventilation to survive, the literature focuses on three types: Endotracheal tube, Nasal Intermittent Positive Airway Pressure and Nasal Continuous Positive Airway Pressure.

Recommendations:

-Invasive ventilation via endotracheal tube is currently most commonly used around the world. Remains this way until further research suggests otherwise.

-Some infants may be supported on non-invasive ventilation, but careful assessments must be carried out as failure rates often results in the need to intubate, determined by the condition of the infant.

-Spontaneous breathing test before extubating infants to prevent re-intubation and further risk of damage. (Test failure= 15 seconds of bradycardia, oxygen saturations below 85%).

Consequences of Invasive Ventilation:

Respiratory Distress Syndrome: Most common respiratory morbidity, occurs in around 50% of low birth weight infants. (Ramanthan, 2007). Lack of air in alveoli and loss of elasticity.

Bronchopulmonary Dysplasia: Chronic lung disease, characterised by scarring of lung tissue and thickened tissues. Issues of perfusion and ventilation ratios (Anderson, Elliot, Keith & Novak, 2002).

Implications:

Careful assessment is required to determine which form of ventilation is best suited to the infant.

Health professionals must be able to anticipate which infants require each type of ventilation, this is a valuable tool.

Intensive monitoring of infants for best timing of extubation can reduce the risks of infants developing BPD and RDS, and in turn reducing the length of stay for these infants and the use of ventilator equipment.

Conclusion:

The literature shows that it is best practice to use invasive ventilation to ensure the survival of preterm infants. Infants often need intensive care from birth and evidence suggests to use the form of ventilation that has the most research for the best chance of survival, doing what is possible to avoid further complications. Other forms of ventilation may be appropriate in individual cases depending on the condition of the infant.

We must recognise that research is ongoing and best practice may change with time, nurses must be able to adapt to these changes and give the best possible care.

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PECOT Category	Info relating to question	Explanation
Population/People	Preterm infants (born alive before 37 weeks gestational age) that required invasive or non-invasive mechanical ventilation	These infants are at a vulnerable stage of life, many with immature respiratory systems. Invasive mechanical ventilation can cause trauma to the respiratory structures.
Exposure/Intervention	Preterm infants that require invasive or non-invasive mechanical ventilation.	Will be looking at articles that assess the effects that invasive and non-invasive mechanical ventilation had on these infants' respiratory systems. Positive or negative effects.
Comparison/Control	Will be looking at articles that assess the effects that invasive and non-invasive mechanical ventilation had on these infants' respiratory systems. Positive or negative effects.	Any effects that predominantly appear in preterm infants that required invasive or non-invasive mechanical ventilation. Whether the infants that had non-invasive ventilation had better outcomes.
Outcome	Survival of preterm infants that required invasive mechanical ventilation after birth. The presence, or not of effects from invasive ventilation on these infants.	Does invasive mechanical ventilation cause effects, either negative or positive, on preterm infants due to their vulnerability and level of development?
Time	Various lengths of time. From the preterm infant after birth requiring mechanical ventilation until successful extubation.	Infants may have required mechanical ventilation for various lengths of time. This may account for varying degrees of effect on the infant.

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