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**What is the effect of suctioning and frequency on oxygenation
and bradycardias in infants ≤ 30 weeks gestation requiring
Bubble Continuous Positive Airway Pressure (CPAP)?**

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Abstract

Background: Previous research around suctioning premature infants has focused on endotracheal suctioning. Continuous positive airway pressure (CPAP) has become a major mode of respiratory support. Consequently, there is a need for research that is relevant to this mode of respiratory support.

Aim: To determine the effect suctioning and suctioning frequency has on oxygen saturation levels and bradycardias in infants ≤ 30 weeks gestation on “bubble” CPAP.

Method: The research comprised of two parts:

- An observational study to determine the effect of suctioning on oxygen saturation, desaturations, and bradycardias.
- A randomised crossover study to determine the effect of frequency of suctioning on oxygen saturation, desaturations, and bradycardias.

Results: *Part One:* Analysis demonstrated that increased suctioning frequency significantly decreased oxygen saturation levels and resulted in more desaturations. However, one more desaturation per hour required 5.3 and 7 more suctioning episodes each day for desaturations of ≥ 10 seconds and ≥ 60 seconds respectively. Of note was the increased likelihood of desaturations when the suctioning interval was longer. An increase interval of 1 hour 40 minutes between suctioning times led to one more desaturation ≥ 10 seconds per hour, with one more desaturation ≥ 60 seconds with $3\frac{1}{2}$ hours increase in interval. Bradycardias were also significantly increased by one per hour, when suctioning frequency increased by 15 intervals per day. Conversely, the odds of a bradycardia occurring if the suctioning interval increased one hour was 1.9. *Part Two:* Analysis demonstrated that overall there were less desaturations and bradycardias with 2 hourly suctioning compared to 4 hourly. However, numbers were too small to determine statistical significance. Data from the effect of suctioning, for

both parts, demonstrated prolonged periods of recovery for infants, with minimal or no change in supplemental oxygen, which may have affected results.

Conclusion: Significance was demonstrated in relation to more desaturations and bradycardias with increased frequency of suctioning in Part One, though the prolonged recovery time may have influenced these outcomes. Of more significance were the findings that demonstrated increased desaturations and bradycardias with longer intervals between suctioning. Results from Part Two were inconclusive due to small numbers of participants. This study provides a baseline for evidence on suctioning premature infants on CPAP, guideline development and a foundation for future research.

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