

MANIKIN BASED STUDIES OF SIMULATED RESUSCITATION PRACTICES: PRETERM FACE MASK STUDY

F.E. Wood¹, C.R. Platten², S. Byrne¹, J.P. Wyllie¹

¹*Department of Neonatal Medicine, ²Regional Medical Physics Department, South Tees Hospitals NHS Foundation Trust, James Cook University Hospital, Middlesbrough, UK*

Background and aims: No studies have investigated the force required for effective mask seal in relation to mask leak, design and ventilation technique. We aimed to determine whether leak at the face mask and force applied to achieve mask seal differs between masks designed for use in preterm infants when using either a single handed mask hold (SH) or a two handed mask hold (TH) (two-person technique).

Methods: A unique purpose built extremely preterm manikin (approx. 25/40, 750g) received positive pressure ventilation from 72 participants in a system designed to measure mask leak and applied force. Six preterm masks from four manufacturers were compared. Data from a Florian monitor and concealed force plate were analysed using Spectra[®] software.

Results: Mask leak was substantial with a significant difference between masks for both SH and TH techniques. Leak was significantly reduced with the TH technique. Leak differed between professional categories ($p=0.003$) with the SH but not the TH technique.

Mean applied force was significantly different between mask type and professional category ($p<0.001$) with both techniques. The correlation between applied force and mask leak was negligible and does not suggest any meaningful relationship.

Masks differed in the percentage of successful attempted inflations; percentages improved with the TH technique.

Conclusion: In this extremely preterm model the lowest leak, lowest applied force and most successful ventilation occurred with the smallest masks tested. There was less mask leak and reduced variability between professional categories with the TH technique but increased mean applied force.