

# Do infants exhale through their CPAP system?

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## Results

In 33 out of 62 measurements (53%) exhalation occurred through the NCPAP system.

## Conclusion

More than half of the infants exhale through the CPAP system. As described in previous studies, leakage is common.

Absolute leakage and differences between prongs and nasal mask will be reported when the ToNIL trial has been completed.

## Background

During nasal Continuous Positive Airway Pressure (CPAP) treatment interface leakage is common and leads to reduced CPAP (1) and treatment effect. Measuring leakage without affecting the neonate or adding dead space is challenging (2) but possible using the flow-through technique with low-resistance flow meters (2, 3). Observational studies have shown that neonates are preferred nose-breathers (4) but it has been suggested that neonates are unlikely to exhale through the CPAP device (1). As far as we know exhalation through the CPAP device has not been previously studied or confirmed.

## Objective

To investigate if neonates exhale through the CPAP device.

## References

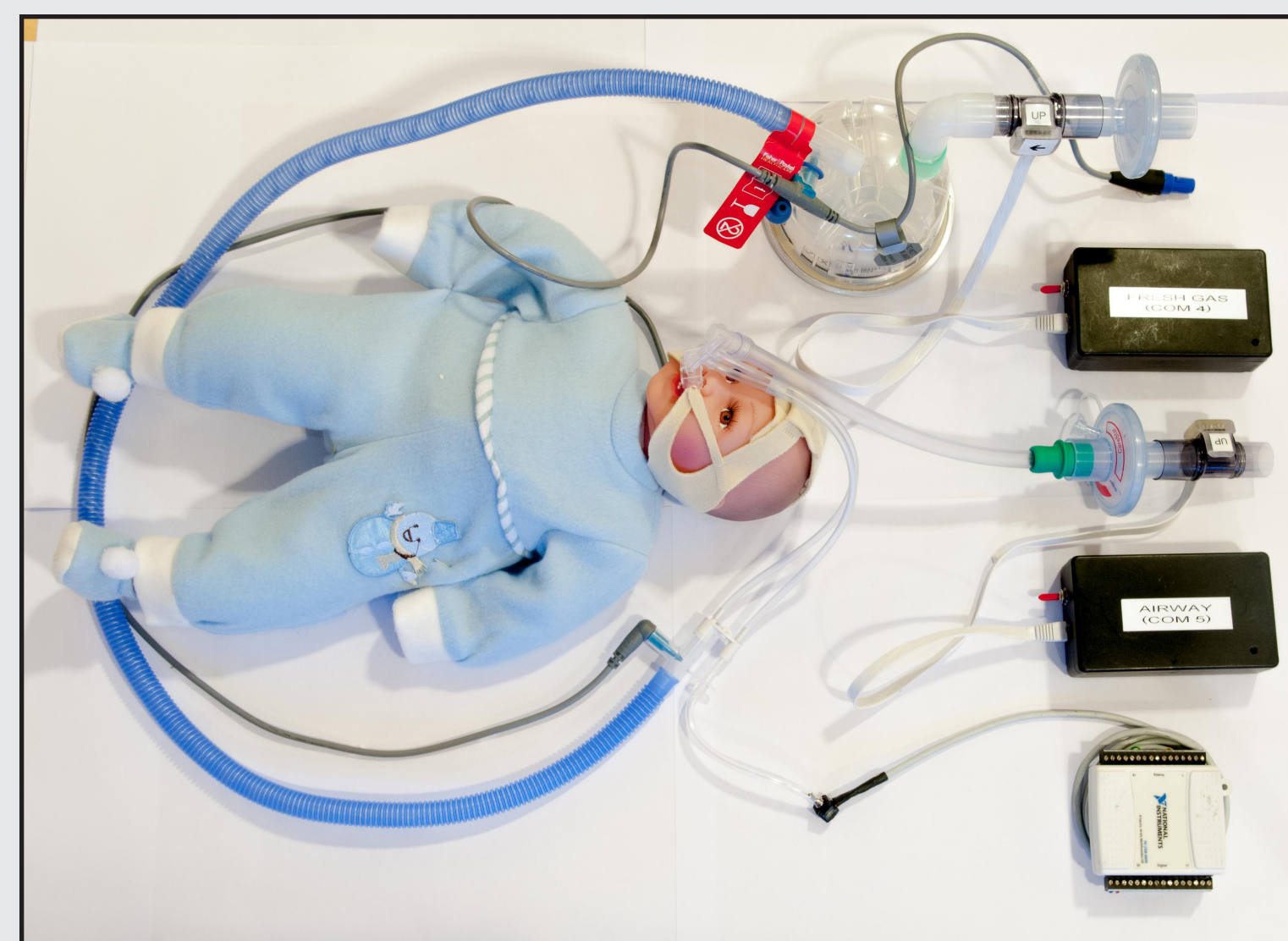
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## Design/Methods

31 neonates (mean GA 35+1, mean weight 2388 grams) with stable spontaneous breathing treated with CPAP were included in a cross-over study (ClinicalTrials.gov NCT03586856) comparing leakage with nasal mask to leakage with nasal prongs. The interface order was randomized and the system was applied by a nurse blinded to leakage measurements. Using the flow-through technique, fresh gas and expiratory flows were recorded (Sensirion) for 30 seconds during Infant Flow CPAP treatment when the infant was quiet and resting. By subtracting the device expiratory flow from the fresh gas flow, patient breathing and leakage was determined. Exhalation through the CPAP system was defined as a patient expiratory flow exceeding the leakage (calculated flow below zero) at least 2 times in the 30 second recording.

## Limitations

Only the Infant Flow CPAP system was used and the staff was not blinded to the study purpose.



Setup of flow and pressure meters.

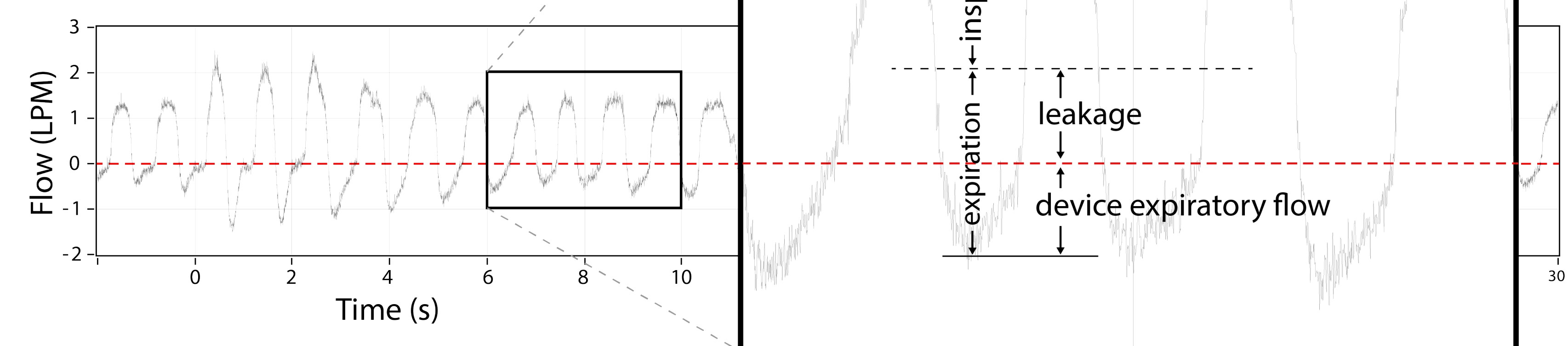
Fresh gas flow was measured on patient inlet and device expiratory flow was measured on the device flow outlet. Pressure was measured at the device pressure port.

## Currently enrolling

The ToNIL study is a clinical randomized cross-over study aiming at comparing leakage with nasal mask to leakage with nasal prongs during nCPAP treatment (Infant Flow) using the flow-through technique.

Poster data was extracted from the trial but without unblinding the type of interface.

## Fresh Gas Flow - Device Expiratory Flow



Resulting flow when subtracting the device expiratory flow from the fresh gas flow.

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