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**Title:** Nocturnal wheeze measurement in preschool children

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**Body:** Rationale Wheezing is a very common symptom in preschool children. Nocturnal wheezing is present in many asthmatic patients, due to enhanced airflow limitation overnight. We assessed the prevalence of nocturnal wheezing in young children and correlated this with respiratory system resistance and history of wheezing symptoms. Methods Using a continuous overnight recording of respiratory sounds we analyzed wheeze rate (ratio between wheezing time and recorded breathing time), oxygen saturation and heart rate during one night in 59 3-year-old children of an ongoing birth cohort study, the WHISTLER-project. We associated the nocturnal measurements with the patient's history of wheezing symptoms and with measurement of respiratory system resistance (Rint). Results Analysis of wheeze rate was successful in 44 children. The overall wheeze rate of these children was low, with the highest wheeze rate of 0.63% measured by the tracheal sensor during expiration. In total, 21/44 children had a wheeze rate of  $\geq 5\%$  during at least one minute. There was no statistically significant difference in wheeze rate between the children with and without a history of wheezing. The wheeze rate of the tracheal sensor had a significant correlation with Rint (correlation coefficients of inspiration and expiration: 0.308 and 0.382, p-values 0.05 and 0.01, respectively). Conclusions Overall, the wheeze rate in young children is low, but seems to increase over night-time. Almost 50% of the children have sporadic wheeze during the night. Although higher nocturnal wheeze rates are related to increased respiratory system resistance, it is not related to clinical wheezing symptoms.