

BTS Guideline for diagnosing and monitoring paediatric sleep disordered breathing

Online Appendix 13 Research Recommendations

Research Recommendations

Sleep questionnaires, combined sleep questionnaires and clinical assessment, sleep video recording and sleep audio recording

- Further research is needed into investigating the diagnostic accuracy of clinically applicable sleep questionnaires, clinically applicable combined sleep questionnaires and clinical assessment, sleep video recording and sleep audio recording for diagnosing sleep disordered breathing (SDB) in infants and children

Pulse oximetry and cardiorespiratory sleep studies (CRSS)

- Further research is needed into determining how pulse oximetry can be combined with other information, such as history, or video or carbon dioxide (CO₂) recordings, to diagnose SDB in children
- As polysomnography (PSG) provides a positive diagnosis of SDB in more children than CRSS, research is needed on how CRSS and PSG relate to clinical outcomes
- A UK standard for paediatric oximetry interpretation is required, particularly focusing on determining oxygen desaturation index (ODI) values that relate to different severities of obstructive sleep apnoea (OSA) /SDB in children
- Research is needed into determining the diagnostic accuracy of pulse oximetry and CRSS as a screening tool for diagnosing SDB in children with comorbid disorders, including cerebral palsy, Down Syndrome, neuromuscular disorders, craniofacial disorders and storage disorders

Pulse oximetry and carbon dioxide (CO₂) monitoring

- Further research is needed into assessing if the addition of CO₂ monitoring to pulse oximetry improves patient/carer quality of life and patient clinical outcomes for children with suspected SDB when compared to pulse oximetry alone
- Further research is needed into assessing if the addition of CO₂ monitoring to pulse oximetry improves the diagnostic accuracy of diagnosing SDB in children with co-morbidities
- Research is needed into comparing the clinical benefits of the addition of end tidal CO₂ monitoring with pulse oximetry and transcutaneous CO₂ monitoring with pulse oximetry in children with suspected SDB

Averaging times, motion artefact rejection and monitoring times

- Research is needed to determine the impact of different averaging times and motion artefact rejection algorithms on the diagnostic accuracy of oximetry to determine SDB across the paediatric spectrum from infancy to older childhood
- Research is needed into determining the optimal monitoring time of pulse oximetry or CRSS to diagnose SDB in children with and without co-morbidities

- Further research is needed on night-to-night variability in pulse oximetry parameters for children with comorbidities using modern oximeter technology, in particular in children with Down Syndrome where pulse oximetry is increasingly used as a screening tool for OSA
- Further research is needed into determining the diagnostic effect of CRSS monitoring over more than one-night to diagnose OSA in children with and without comorbidities

Home monitoring

- Further research is needed to investigate if home CRSS, or home pulse oximetry are as good as inpatient CRSS for improving clinical outcomes in children with suspected SDB
- Research is needed into determining if there are specific age groups of children with suspected SDB, or groups of children with suspected SDB and defined comorbidities who are more, or less suitable for undergoing home sleep studies
- Research is needed into determining how much parental/carer technical advice, support and/or guidance is required to achieve a successful home sleep study for children with suspected SDB

Home mechanical ventilation

- Further research is needed into assessing the clinical outcomes of pulse oximetry and CO₂ monitoring against multichannel study monitoring for monitoring children receiving home mechanical ventilation
- Continuous positive airway pressure (CPAP) device and ventilator algorithms need to be validated in children

Narcolepsy

- Further research is needed into the incidence and prevalence of narcolepsy in children
- Research is needed into the co-existence of OSA and narcolepsy in children

Pre-operative sleep monitoring and tonsillectomy

- Further research is needed into assessing the effect of pre-operative sleep monitoring (pulse oximetry, CRSS or PSG), pre-operative sleep questionnaires, or pre-operative sleep video recording before tonsillectomy, on unscheduled admissions to paediatric intensive care units (PICU), high dependency units (HDU) or overnight inpatient stays in children with sleep disordered breathing