

## **Diagnosis of Obstructive Sleep Apnoea in Children: Standards for Sleep Study Duration**

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### **Background:**

Obstructive sleep apnoea (OSA) affects 1-6% of children & is linked to respiratory, cognitive & other morbidities. Cardiorespiratory polygraphy (CRPG) & pulse oximetry (PO) aid diagnosis in UK centres. There are no guidelines on minimum recording time for these studies.

### **Aims:**

To inform quality standards for optimal CRPG & PO recording duration.

### **Methods:**

Data were collected from 108 children aged 0.5-18y (60 male) having CRPG with simultaneous PO at Southampton Children's Hospital. Differences between: apnoea/hypopnoea index (AHI); oximetry desaturation index 4% (ODI4) & Delta 12s index were assessed for the first 4, 5, 6 & 7 hrs of each recording. Clinical thresholds were set at  $ODI4 \geq 4/hr$  &  $AHI \geq 5/hr$ .

### **Results:**

Limits of agreement between AHI, ODI4 & Delta 12 index widened with increasing duration of recordings. Median absolute AHI differences increased with time difference (4vs5hr median=0.20, CI=0.15-0.35; 4vs7hr median=0.5, CI=0.39-0.82 [ $p < 0.001$ ]) & predictably, severity (4vs7hr median=0.46 at  $AHI < 5$ , & 1.20 [ $p = 0.007$ ] at  $AHI \geq 5$ ). Median ODI4 absolute differences followed a similar trend, with 4vs5hr median=0.20, CI=0.15-0.30; & 4vs7hr median=0.25, CI=0.21-0.39 ( $p < 0.001$ ); & 4vs7hr median=0.21 at  $ODI4 < 4$ , & 0.82 at  $ODI4 \geq 4$  ( $p < 0.001$ ).

Using 7vs4hr of CRPG, 3 more children (18 vs.15) were identified with  $AHI \geq 5$  ( $p = 0.453$ ). No more children were identified using  $\geq 4$ hrs oximetry data with  $ODI4 \geq 4$  ( $n = 12$ ).

### **Conclusion:**

CRPG & PO values differ with longer recording time. Based on 7 vs. 4hrs of CRPG data, 3 extra children would be diagnosed with OSA. CRPG studies of 4hrs duration may underestimate AHI & influence treatment decisions. Minimum standards for duration of recordings should be confirmed in further samples.