



Canadian Down Syndrome Society
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INFORMATION SERIES

Obstructive Sleep Apnea Syndrome

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What is Obstructive Sleep Apnea Syndrome (OSAS)

Obstructive sleep apnea affects the body's ability to receive the amount of air it needs. Although the chest and stomach continue to work to breathe in and out, **periodic** blockage of the airway impacts the air exchange. This results in changes to the oxygen and carbon dioxide levels in the body as well as altered sleep quality and can lead to a number of significant health and behavioural problems.

How often does it occur?

The prevalence of OSAS among healthy children has been estimated as approximately 2% but ranges between 54% and 100% among patients with Down syndromeⁱ, and is often unsuspectedⁱⁱ. It can occur at any age.

Why does it occur more frequently in people with Down syndrome?

Children with Down syndrome are born with unique facial features, skull and respiratory system structure. The upper air passages in children with Down syndrome are smaller, a factor that can be complicated by enlarged adenoids and tonsils and frequent respiratory tract infections. Other predisposing factors include obesity, hypothyroidism and generalized hypotonia (low tone) impacting the function of the upper airway muscles.

What are the signs of OSAS?

Nighttime:

- ✚ Snoring
- ✚ Pauses in breathing, gasping/snorting
- ✚ Unusual sleep positions (for example: sleeping sitting up; with neck hyper extended; folded over with head between feet; or head extended over the edge of the bed.)
- ✚ Restless sleep, complaints of nightmares
- ✚ Frequent waking
- ✚ Reoccurrence of bedwetting (previously continent)
- ✚ Perspiration

Daytime:

- ✚ Failure to thrive - poor growth & weight gain
- ✚ Gastroesophageal reflux (spitting up)

- ✚ Headaches (especially in the morning)

School/Learning issues:

- ✚ Increased learning difficulties
- ✚ Behavioural changes
- ✚ Fatigue
- ✚ Decreased attention span
- ✚ Falling asleep during the day

Other signs:

- ✚ There can be increased strain on the heart due to the increased workload OSAS puts on the heart - even in individuals with no history of congenital heart abnormalities.^{iii iv v}

How do I know if it is OSAS - or "just the Down syndrome"?

OSAS is frequently overlooked as many of its symptoms are also commonly associated with Down syndrome.^{vi} Families are often directed to non-medical mental health professionals for behaviour management. These professionals may not be familiar with the clinical consequences of OSAS and thus may fail to recognize it.^{vii} Also, relying on symptoms for diagnosis may result in under diagnosis as shown in a study that found where of the 77% of children with Down syndrome diagnosed with OSAS, 68% had no clinical signs.^{viii}

How is OSAS diagnosed?

The accepted method of diagnosing OSAS is overnight polysomnography (sleep study). Unfortunately, it is not routinely available, is time-consuming and disruptive to the family's lifestyle. Thus, although it is recognized that it is the ideal diagnostic method, it is not always feasible and other screening approaches may be used to reduce the number of children needing polysomnography. Screening tools include videotaping^{ix}, audio taping^{x xi}, parent questionnaires^{xiii}, and overnight oxygen saturation monitoring in the home.^{xiv}

Screening for OSAS in Calgary, Canada

At Alberta Children's Hospital in Calgary, there is a lengthy wait list for the Paediatric Sleep Clinic and full polysomnography.

Overnight oxymetry (Nonin) is used to screen for OSAS since this method has been compared to simultaneous full polysomnography and was found to be helpful in determining the urgency to book full polysomnography.

What is a Nonin?



The Nonin is a monitor that provides information about heart rate and oxygen levels. In Calgary, parents take it home to be used overnight. The Nonin sensor is slipped over the child's finger (or toe) and the unit turned on when the child is settled for the night. The results are stored within the unit and it is returned to the hospital in the morning. Trained technicians retrieve the information, and the pulmonologist analyzes the results.

Next steps:

✚ As enlarged tonsils and adenoids can affect breathing during sleep - if a child's Nonin shows drops in oxygen levels during sleep, a full sleep study is booked on an urgent basis and appointments with a pulmonologist and/or ENT (Ear nose and throat specialist) are arranged.

✚ If the Nonin study shows no evidence of oxygen dips during sleep, but the child has symptoms that suggest he/she may have OSAS, a non urgent sleep study is booked

✚ When enlarged tonsils and/or adenoids are felt to be a factor, surgical treatment is recommended and full polysomnography is arranged approximately 4 months after the surgery.

✚ Occasionally the tonsils and adenoids have already been removed or they are so small that surgical removal is unlikely to help. In this case, treatment is initiated using a mask and gentle air pressure device during sleep (CPAP).

Treatment Options

Individual treatment approaches, tailored to the child's needs have been suggested, and although there are many clinical case studies, there is no clear identification of treatment standards of care for people with Down syndrome. Studies also show that a relapse of symptoms may occur.^{xv} In Calgary, if tonsillectomy and/or adenoidectomy do not affect a child's OSAS, C-pap is usually the treatment of choice and has been used effectively with this population.

✚ Tonsillectomy and/or Adenoidectomy (removal of tonsils and/or adenoids)^{xvi xvii}

✚ C-pap (Continuous positive airway pressure)^{xviii}. This is always effective but may take some time to get used to

✚ In select cases a specialized operation is sometimes indicated and should be performed by an otolaryngologist experienced and familiar with OSAS in children with Down syndrome.^{xix}

Does treatment help?

✚ Parents and teachers often report significant improvement in the child's attention, energy, learning and behaviour.

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Obstructive Sleep Apnea Syndrome Resources

Available at CDSS check out our website at www.cdss.ca go to resources-newsletter articles-obstructive sleep apnea.

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