Sleep Disordered Breathing (SDB) has been researched for many years for the adult, however, interest in sleep problems for children is a more recent occurrence. Various questionnaires have been used for adults to determine the likelihood of sleep issues. These adult questionnaires such as the Epworth Sleepiness Scale, the STOP-Bang Score, the Multiple Sleep Latency Test, the Stanford Sleepiness Scale, and the Snoring Severity Scale were specifically designed to analyze the symptoms typical for adults suspected of having SDB. Symptoms that are observed in children however, are different from those of the adult and as a result, the adult scales are not appropriate for the analysis of a child.

The dental professional usually begins seeing young patients at around 2 to 4 years of age and traditionally they recall them back into the office every six months on a regular basis. This is in direct contrast to the medical professional, where a patient is usually only seen when a problem arises but not as a routine. The dental professional, as a result, is well positioned to recognize patients with SDB at a very young pre-school age. An easy to use questionnaire(s) for the parents of every child would be extremely beneficial to patients that are suspected to be suffering from sleep issues. Treating young patients before they start school would provide them with a great advantage. Treatment however, at any given age up to 12 years could be of great advantage to any patient.

SLEEP DISORDERED BREATHING QUESTIONNAIRES for Young Children

By Earl O. Bergersen, DDS, MSD
the Cleveland Adolescent Sleepiness Questionnaire, however, a questionnaire that could be more specific for dental use would be an advantage in diagnosing children suspected of having sleep deprivation. The dental profession has appliances that are capable of preventing the mandible and tongue from being posteriorly displaced while sleeping, and these same appliances can also advance the lower jaw and tongue and as well as to increase mandibular growth in cases with a retrognathic lower jaw. Thus it follows that these appliances can be used for a greater advantage in treating sleep problems. These various appliances can also, correct open-bites, swallowing abnormalities, maxillary palatal narrowing, mouth breathing, advance the maxillary dentition and pre-maxilla, increase nasal breathing with, improved palatal tongue position, snoring, thumb and finger sucking. All of these problems above that can be corrected by the dental professional are typically associated with SDB as well as being interconnected with many other symptoms. These problems, when treated at early ages are easily corrected and are usually more stable than those attempted to be treated at other ages such as at 12 years or older. As a result, these corrections by the dental professional may be able to permanently improve a young child’s well-being.

The SDB Questionnaire for Children is patterned after the various child questionnaires that are commonly used at present. It is specifically designed to be more applicable for the dental professional. This Parent Questionnaire for children consists of 15 symptoms obtained from Sahin et al’s research from a sample size of 1164 children. These 15 items had statistical confidence levels of P=0.001. Four items were obtained from research by Urschitz et al while one item was used from Attanasio and Bailey (dark circles under the eyes, that is reported to be linked to a reduction in nasal breathing). Symptoms #6 and #7 in the questionnaire are based on data from the American Thoracic Society Standards. The section of abnormal speech symptoms that are associated with SDB are based on research by Barr et al. A questionnaire to determine the presence of
ADHD in a child is drawn from standards of diagnosis of those children suspected of having ADHD from the American Psychiatric Association$^{18}$ and is a separate addition to the basic questionnaire.

A third questionnaire (Questionnaire #3) is for the dental professional. This questionnaire consists of 12 items filled out during the general patient exam and 9 items that are present from a cephalometric evaluation involving measures of the antero-posterior position of the mandible in relation to the pharynx and the width of the pharynx as well as the size of the adenoid tissue.

These three questionnaires cover a diagnosis applicable for the dental professional in order to consider treatment of these symptoms. The Pediatric Sleep Questionnaire$^1$ was analyzed by Chervin et al (2007)$^9$ in order to see if this questionnaire could predict the presence of obstructive sleep apnea (OSA). It was found to accurately predict OSA about 74% of the time in children as verified by polysomnography. OSA has an incidence of only 1.6% in children$^{20}$ however, there are many other symptoms that have a significant impact on a child’s future life without the presence of apnea.

If one examines common symptoms of children at various ages having suspected ADHD, one is impressed by the increase in serious consequences as the affected child matures. One is also impressed by the great similarity between the symptoms of ADHD and sleep problems in children.

Tables 4-8 show the advancing and increasing detrimental effects as the child matures.$^{21}$ Of significance is the general behavioral problems (Tables #4 and #5), however, when the affected child begins school, the difficulties become considerably more serious (Table #6). Such symptoms as poor school performance, 50% failing at least one grade, being antisocial, 50% developing drug and alcohol problems, having fewer friends, and often being in trouble are all quite common. Once the child starts high school (Table #7) the problems become even more serious since 80% of hyperactive children retain these symptoms even into the teen years. Those with 2 symptoms or more are considered to be at high risk. Fifty percent have drug and alcohol addiction and are often in trouble with the law.$^{19}$

These tables
strongly indicate the need for early recognition of these symptoms in the pre-school child, or at least before the child enters high school. In that these various symptoms are so similar to those of sleep-disordered breathing, it makes it imperative for the dental practitioner to recognize and treat these problems as early as possible.

A perfect example is of an 8 year old boy that had a sleep and speech questionnaire which indicated 17 problems (Table #9). The same child's questionnaire at 13 years of age is shown in Table #10 after wearing an appliance. This patient was voted as the most popular and the most athletic student in his 6th grade. When the mother filled out the questionnaire for ADHD, the result was predictable (Table #11). He would not sit still even for 30 seconds and had severe attention deficit. He breathed through his mouth while sleeping and snored every night. When an appliance (Nite-Guide®) was given to him that prevents the distalization of the mandible and tongue while sleeping, several of his telltale symptoms immediately stopped (constant movement in bed, sitting up and talking, sleep walking). In addition the patient had more energy upon waking. School performance also began to improve. Taking the same ADHD test at 13 years (Table #12) shows the improvement. This case illustrates the changes that the dental professional is able to make in order to redirect a young person's life. Eighty percent of early ADHD patients maintain the problem into their teen years, as stated above.21

This patient makes a point of wearing his preformed mandibular advancement appliance to prevent the mandible from posteriorly displacing while sleeping before a scheduled sports competition. He experienced increased energy and performance as a result. This is probably due to the increased oxygen restoration while sleeping. Often ADHD patients are found to be clumsy and uncoordinated, so this is a dramatic change for this patient. He was captain of his hockey team and had the highest number of goals as a 13 year old. He also ran the half mile and was ranked #3 over approximately 38000 6th grade students.

This case illustrates the importance of intercepting such a case at a young age to change a child's course of development without medication to calm the hyperactivity which can dull a child's personality without curing the cause of such a problem.

The introduction of the dental professional into the diagnosis and treatment of sleep problems in children is a great advantage for a couple of reasons. The first of these is that with the early monitoring of patients on a regular basis, starting at 2 to 4 years of age, allows the dental office the ability to intercept sleep issues at a very early age. The second is that the child can be corrected prior to their entering school where more complicated issues exist.

Editor's Note: For full references, visit www.orthodontics.com


