



## Sleep

It's estimated that children diagnosed with autism spectrum disorder (ASD) experience sleep difficulties at a greater rate than children who are not diagnosed with ASD, with the prevalence ranging from 40% to 80%.<sup>1</sup> These issues can include the following:

- difficulties falling asleep
- difficulties remaining asleep
- disordered breathing
- daytime sleepiness
- challenging behaviors revolving around the sleep routine

Sleep is an important variable in all children's development and is linked to attention, behavior, learning, memory, emotional regulation, quality of life, and mental and physical health.<sup>2</sup> This is why it can be critical to address any sleeping concerns at a young age and as soon as they are noted.

Currently, many families may reach out to their physician when there is a concern regarding sleep. However, a national survey of pediatric residency programs found that pediatricians typically receive only five hours of training on addressing sleep challenges.<sup>4</sup> Researchers have also found that when families contact their physician regarding sleeping concerns, 81% of those families receive prescription recommendations.<sup>4</sup> Luckily, there is a wealth of behavioral research that focuses specifically on the pediatric and autism populations. Behavioral intervention can be helpful due to the individualization of function-based procedures that can be developed after an assessment. These interventions should be tried first prior to the use of medications.

However, prior to any intervention, it is important for families to consider the typical sleep schedule for children and the common variables associated with a healthy sleep routine. According to the American Academy of Pediatrics, the following sleep schedules are recommended by age:

Age	Amount of Sleep Recommended <sup>2</sup>
4 mos-12 mos	12-16 hours, including naps
1 yr-2 yrs	11-14 hours, including naps
3 yrs-5 yrs	10-13 hours, including naps
6 yrs-12 yrs	9-12 hours
13 yrs-18 yrs	8-10 hours

Basic variables for a good sleeping routine include<sup>7</sup>:

- a dark bedroom
- a good temperature for sleeping
- no electronics within 30 minutes-2 hours of bedtime
- a noise-free or distraction free environment
- a consistent sleep and wake time
- a consistent routine before sleep
- daily exercise
- avoidance of large meals before bed or meals that contain caffeine
- comfortable sleep clothing

It is also important for families to rule out any medical contributors prior to beginning any behavioral intervention. Medical contributors can include, but are not limited to, gastrointestinal disorders, epilepsy, pain, nutritional issues, and other underlying sleep disorders responsible for insomnia, including sleep-disordered breathing.<sup>8</sup>



Once medical contributors have been ruled out and the basic variables associated with a good sleep routine have been evaluated, behavioral intervention should be considered. Some basic strategies that have been investigated and found to be effective in decreasing sleep difficulties while increasing overall sleep duration include:

**Faded Bedtime:<sup>3</sup>**

This procedure involves collecting baseline data in order to determine when rapid sleep onset (i.e., the time that someone actually falls asleep) is most probable, and then adding 30 minutes to this time for the target bedtime. For example, if the average time of sleep onset for Johnny across 7 days is 12:15 pm, we would add 30 minutes to this time and put Johnny to bed at 12:45 pm. Other sleep hygiene procedures including not allowing the child to sleep during the day and never allowing the child to sleep past the prescribed wake time are also used. As the child starts successfully falling asleep within 15 minutes of being put to bed, the bedtime is gradually faded to an earlier time. In our example, if Johnny successfully falls asleep within 15 minutes of being put to bed, we would then put him to bed at 12:30 the next night.

**Positive Routines:<sup>5</sup>**

This procedure involves establishing a routine of pleasurable and calming activities that are used just prior to bed in order to induce sleepiness. The routine of activities lasts 30-40 minutes and is kept consistent in order to establish a relationship between the calming activities and onset of sleep. Positive routines are usually paired with other intervention strategies such as the faded bedtime protocol mentioned above. The goal is to have the routine serve as a signal to the child and the child's body that bedtime is coming.

**Function Based Interventions:<sup>4</sup>**

With function based interventions, behavior analysts work with the family to identify contingencies that are in place that lead to the interfering behavior contacting reinforcement. A disruption of this contingency is planned so that the interfering behavior's relationship to a reinforcer is weakened. For example, if after being told goodnight, Annie removes herself from bed in order to gain access to books and other small toys, intervention would involve offering access to these items during *only* the 30 minutes prior to bed. Access to these items would then be withheld after Annie is bid goodnight.

**Bedtime Pass:<sup>6</sup>**

In this procedure, a child is given a one time pass in the form of an index card with their name on it that will allow him/her one opportunity to leave the bed or bedroom. After the bedtime passed has been used, all other attempts to leave the room are ignored.

**Extinction/Graduated Extinction:<sup>9</sup>**

Classic extinction involves ignoring a child's behavior that follow after they are put to bed, while still monitoring for their health and safety. This procedure is recommended mostly for children whose negative bedtime behaviors are typically reinforced by the attention of parents and/or siblings or removal from the bedroom. With graduated extinction, parents systematically increase the amount of time that elapses between "well checks,": that is, if Johnny's parents typically check in on him 10 minutes after he begins to cry when being put to bed, they would begin to systematically increase the interval of time that passes before the next check. This can be done in one night, or across nights. For example, Johnny's parents might first check on Johnny at 10 minutes, and then 15 minutes, and then after 20 minutes within one nighttime routine before Johnny is able to discover a process of self-soothing and fall asleep.

**Scheduled Awakenings:<sup>9</sup>**

With this method, baseline data is collected in order to determine when the child typically awakens in the middle of the night. Parents then awaken their child 15-30 minutes prior to this time and provide the same consequences for the child that they would when the child typically awakens in the middle of the night. These scheduled awakenings are then systematically faded.

**Stimulus Fading:<sup>10</sup>**

For some families who co-sleep, it can be difficult to teach a child to begin to sleep on their own. This method involves slowly fading out the parents over successive nights. Initially, a family might move a child into his own room and begin sleeping with the child in the child's room. The parents might then place a mattress next to the child's bed and begin sleeping next to the



child with their hand on the child. The parent would then fade their hand, and eventually increase the distance of the mattress to the child's bed until the parent is able to sleep outside of the room.

Prior to beginning any behavioral intervention, it is important that parents contact and consult with the appropriately trained and qualified clinician. A high-quality behavior analytic provider will be able to help families evaluate all of the variables that are affecting a child's sleeping pattern. A qualified provider will also be able to help train the family on the necessary steps of the protocol that is best for the child and family. Last, a high quality provider will be able to consult with other professionals, such as occupational therapists, as needed in order to ensure that all aspects of the child's development are being considered.

### *References*

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