Pediatric bed enclosures

Clinical Policy ID: CCP.1537

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Next review date: 4/2027

Policy contains:Autism; bed enclosure; Cubby Bed; insomnia; neurodevelopmental disorder; sensory bed; sleep disorder.

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Coverage policy

A pediatric bed enclosure is clinically proven and, therefore, may be medically necessary to provide a safe and secure sleeping environment in the home for members who are at risk of falls, wandering, or self-harm (Harris, 2015; Sherburne, 2017).

Limitations

A pediatric bed enclosure is contraindicated in members who (Harris, 2015):

- Are violent, combative, self-destructive, suicidal, or claustrophobic.
- Have multiple intravenous lines, urinary catheters, or medical tubing.
- Become increasingly distressed after being placed in the bed.

The following items are considered nonhospital beds or accessories items and not medically necessary, as the clinical value and long-term clinical outcomes have not been established:

- Beds sold as traditional furniture including adjustable beds (e.g., a Craftmatic Adjustable Bed, Simmons Beautyrest adjustable bed, Electrometric adjustable bed, and Sealy Posturepedic Bed).
- Accessory items or services (e.g., technology hubs, travel cases, memory foam mattresses, other bed accessories such as bed linens, tables, and pillows) that do not contribute meaningfully to the treatment of an illness or injury or the functioning of a malformed body part.
- Upgrades for aesthetic purposes or upgrades as part of an enclosed bed purchase that do not meet the rules for durable medical equipment, including, but not limited to:
    - Special lights, sounds, fans, cameras, two way talk monitors, vibration pads, or weighted blankets.
    - Custom wood types, finishes, or engravings, or special coverings on the outside of the bed.
    - Custom upgrades where lower cost alternatives are readily available.

Alternative covered services

- Cognitive behavioral therapy.
- Pharmacotherapy.
- Parental education.
- Door locks and door alarms (may be noncovered services).

Background

Neurodevelopmental disorders are a group of conditions caused by changes in early brain development that affect brain processing, resulting in impairments in personal, social, academic, or occupational functioning (American Psychiatric Association, 2025). Sleep disorders are common among people with neurodevelopmental disorders, which can severely impact the quality of life and sleep of the affected individual and their caregivers. Contributing factors include environmental influences, caregiver-related factors, and disease-related etiologies (Blackmer, 2016).

Among children with autism spectrum disorder, behavioral factors, such as inability to self-calm, communication impairment, sensory processing issues, circadian sleep–wake cycle abnormalities, and chemical and metabolic mechanisms may contribute to sleep disturbances. Children with autism spectrum disorder, in particular, may have wandering tendencies (Johnson, 2024).

Neurodiverse children who are able to climb out of their beds are at risk of falls, wandering, and subsequent injury. A bed enclosure, also called a safety bed, canopy bed, or child-safe bed, is a fully enclosed canopy designed to prevent children from leaving their bed at night without supervision. A bed enclosure allows the patient to remain in a safe environment without the need for physical or chemical restraints, which may be detrimental to development, and offers the caregiver uninterrupted sleep and peace of mind.

A sensory bed combines a sensory-blocking bed enclosure with control of lighting, sound, vibration, and ambient temperature to create a comfortable, customizable, and relaxing sleep environment. Sensory beds may include motion sensors or cameras for remote monitoring and a control panel accessible from a smart phone or tablet. Examples include the Cubby Bed™ with Technology Hub (Cubby Beds, Denver, Colorado) and the zPod ® (Zpods Holdings LLC, Saint Peters, Missouri).

Findings

Therapeutic management of sleep disorders in neurodiverse children is based largely on clinical experience and small observational studies, limited by subjective outcomes and study design. Current guidelines and supportive evidence suggest cognitive behavioral therapy and melatonin appear to be the most effective interventions.

There is insufficient evidence supporting the use of sensory beds or other bed accessories to alter sensory stimuli as an effective treatment for sleep disturbances.

Guidelines

The American Academy of Neurology issued recommendations for treating sleep disturbances in children and adolescents with autism spectrum disorder. The strongest evidence supports the effectiveness of melatonin with or without cognitive behavioral therapy for improving multiple sleep outcomes compared with placebo. Evidence is insufficient to determine the effect of parental sleep-specific behavioral training. The guideline did not mention the use of sensory beds or sensory altering stimuli to improve sleep hygiene. The following recommendations received a Level B rating, meaning the recommendations were associated with confidence in the rationale and a favorable benefit-risk profile (Williams Buckley, 2020):

- There should be an assessment of coexisting medical conditions and concomitant medications that may contribute to sleep disturbance.
- First-line therapy is cognitive behavioral therapy to improve sleep hygiene.
- Pharmacologic therapy (melatonin) may be indicated if managing coexisting conditions and adopting behavioral strategies are unsuccessful.
- There is insufficient evidence to support the routine use of weighted blankets or specialized mattress technology for improving disrupted sleep (Frazier, 2017), although weighted blankets appear safe and could be a reasonable nonpharmacologic approach for some individuals.

Evidence review

A summary of eight systematic reviews (38 total included studies) examined the efficacy of five interventions for treating sleep problems in children with autism spectrum disorder. Melatonin, behavioral interventions, and parent education/education programs appeared to be the most effective at ameliorating multiple domains of sleep problems compared with other interventions. There was insufficient evidence supporting pharmacologic treatments other than melatonin or alternative therapies (e.g., massage therapy, aromatherapy, and multivitamin and iron supplementation). The effect of polytherapeutic approaches requires further study (Cuomo, 2017).

For managing sleep disorders in children with neurodevelopmental disorders, the complexity of diagnosis and lack of high-quality evidence prevents a consistent approach to therapy. The initial approach should include evaluation and resolution of contributing or exacerbating factors of insomnia, including sleep hygiene, prior to initiating pharmacologic treatment. Iron supplementation, melatonin, and less common interventions (e.g., clonidine, gabapentin, hypnotics, trazodone, and atypical antipsychotics) may be prescribed. However, the heterogeneity of neurodevelopmental disorders and the lack of available data prevent determining the optimal choice of therapy. Ultimately, the medication with the least risk of toxicity and/or possibility of drug–drug interactions should be chosen (Blackmer, 2016; Johnson, 2024).

Sensory beds

The evidence for sensory bed technology is limited to one preliminary cross-over trial of the Sound-to-Sleep™ mattress (Kugona LLC, Lake Forest, IL) in children with autism (n = 45) (Frazier, 2017). The Sound-to-Sleep mattress technology embeds vibrations into the mattress corresponding to a sound source of the child's choosing. The Sound-to-Sleep mattress was generally well-tolerated among children and resulted in parent-reported improvements in sleep quality in the short-term. It may result in higher short-term sleep efficiency (i.e., the percentage of time spent asleep while in bed) over two weeks of use (78.27% when mattress was turned on versus 75.45% turned off, raw mean difference = 2.82%, 95% confidence interval 1.14 to 4.50). However, there was no statistically significant improvement in other measures of sleep continuity such as sleep onset latency (i.e., amount of time from lights turned off until the onset of any sleep stage), wake after sleep onset (i.e., the

time individuals spend awake after sleep onset and before sleep offset), or total sleep time (i.e., sleep duration during a given sleep period time). Adverse effects were not described (Frazier, 2017).

A new systematic review of non-pharmacological treatments of sleep disorders in autistic children and adolescents without intellectual disability identified no other published studies of sensory beds (Vargas, 2025).

Pediatric bed enclosures

The evidence supporting the use of pediatric bed enclosures is limited to inpatients requiring some kind of restraint to ensure their safety. In one randomized controlled trial (n = 49 total), a bed enclosure was effective and more acceptable to relatives and providers than standard restraints, although there was no difference between groups in level of agitation, length of stay, time in restraints, or total dose of medication (Nawaz, 2007).

A retrospective chart review of 208 pediatric enclosure bed encounters in an acute care setting over a two-year period found children with new-onset cognitive impairment were more likely to incur falls, skin breakdown, and injury during use of the enclosure bed. However, an enclosure bed was reasonable for certain children to ensure their safety (Sherburne, 2017).

In one institution's experience with enclosure beds used for more than 200 inpatients, no patient falls or injuries occurred, and sitter expenses decreased. Enclosure beds were incorporated into some home care plans for patients with agitation secondary to dementia and for pediatric patients with significant chronic neurologic or behavioral problems as an option for fall prevention and patient safety. The main benefit of using an enclosure bed at home was giving caregivers a respite period from caring for the child by providing a safe environment (Harris, 2015).

The inpatient experience with bed enclosures offers some insight into appropriate use at home. To be considered for the enclosure bed, the patient must be at high risk for falling and must demonstrate one or more of the following characteristics: impulsiveness; agitation; inability or unwillingness to ask for assistance or respond to redirection; unsteady gait; or wandering behavior. An enclosure bed is contraindicated for (Harris, 2015):

- Patients who are violent, combative, self-destructive, suicidal, or claustrophobic.
- Patients with multiple intravenous lines or urinary catheters.
- Patients who become increasingly distressed after being placed in the bed.
- Patients with a history of falling alone.

In 2024, we updated the references with no policy changes warranted.

In 2025, we updated the references and added one systematic review to the policy. We modified the coverage criteria to expand on durable medical equipment considered not medically necessary.

References

On September 11, 2025, we searched PubMed and the databases of the Cochrane Library, the U.K. National Health Services Centre for Reviews and Dissemination, the Agency for Healthcare Research and Quality, and the Centers for Medicare & Medicaid Services. Search terms were "bed enclosure," "autistic disorder (MeSH)," "behavior therapy (MeSH)," "music therapy," "sensory bed," "sound therapy," "chromotherapy," "escape," and "autism." We included the best available evidence according to established evidence hierarchies (typically systematic reviews, meta-analyses, and full economic analyses, where available) and professional guidelines based on such evidence and clinical expertise.

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Policy updates

11/2023: initial review date and clinical policy effective date: 12/2023

11/2024: Policy references updated.

12/2025: Policy references updated. Coverage modified.