Sensory Integration Therapy and Auditory Integration Training

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Instructions for Use

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Community Plan Policy

- Sensory Integration Therapy and Auditory Integration Training

Medicare Advantage Policy

- Skilled Nursing Facility, Rehabilitation, and Long-Term Acute Care Hospital, and Private Duty Nursing

Application

UnitedHealthcare Commercial

This Medical Policy applies to UnitedHealthcare Commercial benefit plans.

UnitedHealthcare Individual Exchange

This Medical Policy applies to Individual Exchange benefit plans.

Coverage Rationale

The following are unproven and not medically necessary for treating any condition due to insufficient evidence of efficacy:

- Sensory integration therapy (SIT)
- Auditory integration training (AIT)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other policies and guidelines may apply.

CPT Code	Description
97533	Sensory integrative techniques to enhance sensory processing and promote adaptive responses to environmental demands, direct (one-on-one) patient contact, each 15 minutes

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Description of Services

Sensory Integration Therapy

Sensory integration therapy seeks to improve perception and integration of sensory information and thereby help individuals with learning disabilities improve their sensorimotor skills. In theory, this will result in improved behavior and academic performance. Therapy is usually provided by an occupational therapist and combines primitive forms of sensation with motor activity during an individual therapy session that typically lasts 60 to 90 minutes. The therapist provides vestibular, proprioceptive, and tactile stimulation during activities that are designed to elicit appropriate adaptive motor responses. Sensory integration techniques include the use of textured mitts, carpets, scooter boards, ramps, swings, bounce pads, suspended equipment, and weighted vests and blankets to encourage a noncognitive, creative, and explorative process. Therapy is usually given in one to three sessions per week over several months or a few years, and it does not involve tutoring, which is the more traditional approach to the treatment of learning disabilities (Salokorpi et al., 2002; Uyanik et al., 2003).

Auditory Integration Training

Auditory integration training (AIT) was developed as a technique for improving abnormal sound sensitivity in individuals with behavioral disorders or autism spectrum disorders (Sinya et al., 2011). The Berard AIT protocol requires that an individual listens to modulated music on a specific device using high-quality headphones for a total of 10 hours, over 10 or 12 consecutive days under the supervision of a professionally trained AIT practitioner (AIT Institute, 2018).

Clinical Evidence

Sensory Integration Therapy

Sensory integration therapy (SIT) has been investigated as a treatment for multiple sensorimotor disorders. There is insufficient evidence to demonstrate an increased clinical benefit of SIT compared with standard care alone. A number of small randomized controlled trials (RCTs) suggest a possible benefit of SIT, but these studies are limited by important design weaknesses, such as a short follow-up period, lack of masking of the outcomes assessors, multiple companions, and large attrition rate. Furthermore, the findings are conflicting with those of a larger RCT (Randell et al., 2022) that failed to show benefit and a large propensity score–adjusted, population-based cohort study that raised concerns about possible harm (Tzang et el., 2019).

Kaplan Kılıç et al. (2026) conducted a single-blinded, parallel, randomized controlled, pretest-posttest study that evaluated occupational therapy using Ayres Sensory Integration® (OT-ASI) in children with attention-deficit/hyperactivity disorder (ADHD) at an individual pediatric occupational therapy clinic. The study included 104 children (aged 6-9 years; 68% male) who had ADHD combined type, were attending school, and had stable medication use for at least 1 month. Participants were randomized to receive either OT-ASI (three sessions per week for 10 weeks; 60 minutes per session; 30 hours total) or to the control group that consisted of a 10-week waiting list with no intervention. Five participants discontinued in each group, with 47 participants per group analyzed. The outcomes were assessed at week 0 and week 11 by a blinded assessor. The primary outcomes included results from the Sensory Integration and Praxis Test; Bruininks-Oseretsky Test of Motor Proficiency. Second Edition, Brief Form (BOT-2 BF); and goal attainment scaling (GAS). The authors concluded that OT-ASI had positive effects on sensorimotor functions, executive functions, emotional regulation, and participation in children with ADHD. Limitations of the study include that some of the dependent variables violated the assumption of the equality of variance-covariance matrices, while normality was analyzed using skewness and kurtosis values between -1.5 and 1.5, and all continuous variables were normally distributed in both groups.

ECRI (2025) conducted a systematic review of six RCTs (n = 538 children aged 0-12 years) and also reviewed an additional four RCTs and one nonrandomized study to evaluate the efficacy of SIT in helping children with autism spectrum disorder (ASD). Each study individual in the active treatment arms received near-hour-long SIT sessions in an occupational therapy setting two or three times per week for 4 to 26 weeks, while the nonactive controls received conventional occupational therapy or no additional treatment. The authors reported that across studies, SIT findings were consistent for improvement in developmental milestone achievement, motor skills, and socialization; however, for problem behaviors, the data favored neither SIT nor usual care, and the findings were mixed for activities of daily living. The report concluded, with a favorable outlook, that SIT may help children with ASD develop motor and social skills but does not reduce problem behaviors that are typical of ASD. ECRI stated that their confidence in these conclusions is low because the studies involved few individuals and different SIT protocols. There are limitations, including major limitations to evidence interpretation and evidence gaps, while the risk of bias was assessed to be high because of small sample sizes, a lack of assessor blinding, and a single-center focus. This report included the Acuña et al. (2025), Schaaf et al. (2025), and Wen and Wu (2025) studies that are summarized below.

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Schaaf et al. (2025) conducted a parallel-arm comparative effectiveness trial that randomized children who were aged 6 to 9 years old; had confirmed ASD; had sensory differences indexed by the Sensory Integration and Praxis Test and Sensory Processing Measure; had a nonverbal IQ of ≥ 65 (with a few exceptions); and < 12 hours per week of other therapies equal to occupational therapy using OT-ASI, applied behavior analysis (ABA), or no treatment (NT) (n = 99; 33 per group). There were 29 individuals in the OT-ASI group, 28 individuals in the ABA group, and 33 individuals in the NT group who received their allocated intervention; 24 OT-ASI, 27 ABA, and 26 NT individuals completed posttreatment follow-up. Individuals in the OT-ASI and ABA groups received 30 one-hour sessions over 10 to 15 weeks, and outcomes were collected by independent evaluators who were blinded to treatment assignment (with caregivers not blinded for GAS ratings). The primary end point was change in daily living skills from baseline to post treatment, as measured by the parent-reported PEDI-CAT (Pediatric Evaluation of Disability Inventory – Computer Adaptive Test) Daily Living T score and analyzed using intention-to-treat mixed-effects linear regression (missing data not imputed), which showed a mean model-estimated change of 3.011 (95% CI, 0.174-5.849) for OT-ASI, 2.961 (95% CI, -0.047 to 5.970) for ABA, and 0.751 (95% CI, -2.171 to 3.673) for NT, with no evidence of differences among groups (p = 0.467). The authors concluded that both OT-ASI and ABA improve individualized goals, as measured by the GAS, and that both interventions show a trend toward improvements in daily living skills on the PEDI-CAT, with the pre-post change for OT-ASI reaching significance. There are limitations, including an inability to achieve the anticipated sample size for which the study was powered to detect differences and insufficient follow-up data to assess the sustainability of the findings. Another limitation is that the number of outcome measures was overly burdensome for some individuals and caregivers.

Acuña et al. (2025) conducted a systematic review of RCTs to evaluate the efficacy of Ayres Sensory Integration (ASI) in children. The authors followed PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. RCTs were published in peer-reviewed, English-language literature and compared implementation of ASI with its Fidelity Measure™, with children aged 0 to 12 years receiving treatment as usual, other treatment, or NT. Nine RCTs (n = 344), six with autistic children and three with other child populations, were included. RCTs were categorized as level 1b (well designed) or 2b (low quality); the strength of evidence was determined according to U.S. Preventive Services Task Force guidelines. Strong evidence from five RCTs (four level 1b) indicates that ASI supports autistic children in meeting their individualized goals. Moderate evidence from three RCTs (two level 1b) indicates no benefits of ASI for behaviors of concern, such as nonadherence or irritability. Bias concerns persist among included studies. The authors concluded that ASI supports autistic children's individualized goals related to occupational performance, function, and participation. It is not recommended to address behaviors of concern, such as resistance to change or irritability. More research is needed to determine ASI's benefits in other child populations. This systematic review has limitations. The heterogeneity among studies prevented meta-analysis, which imposes methodological limitations. Additionally, bias concerns persisted for most of the included studies, which warrants caution in interpreting the results. Further investigation is needed before the clinical usefulness of this procedure is proven.

Wen and Wu (2025) conducted an RCT to evaluate the effects of a 12-week sensory integration–based sports training program on motor and social outcomes in children with ASD. Overall, 40 participants, who were aged 6 to 12 years, were randomly assigned to either an experimental group that received sensory integration–based sports training or a control group that was engaged in standard physical activity. Motor coordination was assessed using the BOT-2, and social responsiveness was measured using the Social Responsiveness Scale. Weekly behavioral engagement was also recorded. Data were analyzed using paired t tests and Cohen d for effect size. Participants in the intervention group had a 17.2-point increase in BOT-2 scores, which reflects improved motor coordination. Social Responsiveness Scale scores decreased by 13.2 points, which indicates enhanced social responsiveness. Participation rates in structured activities increased from 45% to 85% over the 12 weeks. A statistical analysis revealed a large effect size (Cohen d > 0.8) for both outcomes. The authors concluded that sensory integration–based sports training improves motor and social functioning in children with ASD and offers a promising approach for therapeutic and educational rehabilitation programs. This RCT has limitations. The sample size of 40 limits the generalizability of the findings. In addition, the 12-week duration may not reflect long-term developmental trajectories. Participant variability in age, sensory thresholds, and cognitive function also presents a challenge. While no adverse effects were observed, future studies should formally monitor safety and stress responses during interventions. Furthermore, the lack of neurophysiological data (e.g., electroencephalogram, functional magnetic resonance imaging) limits insight into the neural basis of observed improvements. Future research could investigate how sensory-motor integration alters brain connectivity, which would inform more targeted interventions. Additionally, exploring the impact of the intervention across different autism profiles, including nonverbal children and those with sensory hypersensitivities, can improve accessibility and personalization. Future research may also compare exercise modalities such as yoga, martial arts, or swimming to determine which sport types yield the most transferable benefits.

Yamanishi et al. (2025) conducted an RCT to examine the effectiveness of the ASI intervention in children with developmental coordination disorder (DCD) in improving motor coordination and daily activity function. Overall, 17 children with DCD (aged 4-8.5 years) were randomly assigned to either an intervention or a control group. ASI

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intervention was provided in the intervention group twice a week for 10 weeks. In addition to participants' goals in daily activities, sensory integration abilities and motor coordination were assessed before and after the intervention. The split-plot factorial design demonstrated significant time × group interaction in the total score [F (1, 15) = 7.651; p = 0.014; partial η^2 = 0.338] and balance score [F (1, 15) = 11.163; p = 0.004; partial η^2 = 0.427] of the Movement Assessment Battery for Children – Second Edition, with differences in simple main effects before and after intervention in the intervention group. The postintervention GAS score showed a difference in the time × group interaction [F (1, 15) = 15.662; p = 0.001; partial η^2 = 0.511] and a simple main effect in the intervention group. The authors concluded that a short-term, intensive ASI intervention improves motor performance, coordination, and daily activity function in children with DCD. This RCT has limitations. Blinding of the parents was not possible, although blinding of the assessors was done in practice. In this study, the authors requested that parents keep their usual daily life regardless of the intervention. However, there is a possibility of bias in parents in the intervention group since the parents themselves knew whether their child had received the intervention. Furthermore, the sample size in this study was small in each group. Small samples may not adequately capture the variability in a population, which leads to potential biases or limited statistical power. Although there are limitations in recruiting suitable participants in practical clinical conditions, future studies need to consider larger samples.

Warutkar et al. (2023) conducted an RCT that evaluated SIT for functional mobility in children with spastic diplegic cerebral palsy (CP). Children who were aged 6 to 10 years with spastic diplegic CP, Gross Motor Function Classification System level I to III, and ability to follow commands (pediatric Mini-Mental State Examination score > 23) were included, while those with mental retardation and learning difficulty, uncontrolled seizures for the past 6 months, or prior orthopedic surgery were excluded. Overall, 40 children were allocated to group A (n = 20) or group B (n = 20), with a mean age of 8.20 ±1.36 years in group A and 7.40 ±1.39 years in group B; the gender distribution was 10 males/10 females in group A and 14 males/six females in group B. Group A received SIT for 25 minutes plus conventional physiotherapy for 20 minutes per session, while group B received conventional physiotherapy only for 45 minutes per session, over a 4 week therapy plan. Analyses used descriptive and inferential statistics, including chi-square tests and student paired and unpaired t tests. For the primary outcome of Gross Motor Function Classification System, group A improved from 2.10 ±0.71 (prior to the test) to 1.20 ±0.41 (post test), and group B improved from 2.35 ±0.74 to 1.75 ±0.55, with between-group unpaired t test results reported as 1.08 (p = 0.28) and 3.58 (p = 0.001). The authors concluded that both groups had substantial improvements in functional mobility and that SIT combined with conventional physiotherapy resulted in a significantly greater improvement in functional mobility in children with spastic diplegic CP. There are limitations, including the restriction of the study population to children with spastic diplegia, single-center design, and lack of blinding.

Kelly et al. (2023) conducted a pilot RCT to establish the feasibility of an RCT that compared contextual sensory integration (CSI) training with traditional vestibular rehabilitation. Overall, 30 participants with vestibular dysfunction completed the Dizziness Handicap Inventory, Activities-Specific Balance Confidence Scale (ABC), Visual Vertigo Analog Scale, Functional Gait Assessment, Timed Up and Go, and Four Square Step Test. Following initial assessment, the participants were randomized into 8 weeks (once per week in clinic plus home exercise program) of traditional vestibular rehabilitation or CSI training. Six participants had to stop participation due to the COVID-19 pandemic, and six dropped out for other reasons (three from each group). Ten participants in the traditional group and eight in the CSI group completed the study. The authors applied an intention-to-treat analysis. Following the intervention, the authors observed a main effect of time, with no main effect of group or group-by-time interaction for the Dizziness Handicap Inventory (mean difference, -18.703; 95% CI, -28.235 to -9.172; p = 0.0002), ABC (8.556; 0.938-16.174; p = 0.028), Visual Vertigo Analog Scale (-13.603; -25.634 to -1.573; p = 0.027), and the Functional Gait Assessment (6.405; 4.474-8.335; p < 0.0001). No changes were observed for the Timed Up and Go and Four Square Step Test. The authors concluded that participants' symptoms and function improved following either of the vestibular rehabilitation methods. CSI training appeared comparable but not superior to traditional rehabilitation. This study has limitations, including a small sample size and high attrition rate. Well-designed, adequately powered, prospective, controlled clinical trials of CSI are needed to further describe safety and efficacy.

Cemali et al. (2022) conducted a single-blinded RCT to examine the effectiveness of sensory integration interventions on sensory, motor, and oculomotor skills in infants with cortical vision impairment (CVI) and CP. Overall, 34 infants with CVI and CP who were aged 12 to 18 months were enrolled in the study. The infants were randomly divided into two groups as the control (n = 17) and intervention (n = 17) groups. The intervention group received sensory integration intervention 2 days a week for 8 weeks, in addition to conventional physiotherapy 2 days a week for 8 weeks. The control group only received the conventional physiotherapy program 2 days a week for 8 weeks. The duration of the treatment sessions was 45 minutes for both interventions. Before and after the intervention, sensory processing functions were evaluated with the Test of Sensory Functions in Infants (TSFI), and motor functions were evaluated with the Alberta Infant Motor Scale (AIMS). There was a noted difference between the pre- and posttest mean TSFI total and AIMS scores in the intervention group and control group (p < 0.001). The intervention group mean TSFI scores showed a statistical difference compared

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with those in the control group. Mean postintervention AIMS scores did not differ between groups. The authors concluded that sensory integration intervention delivered with the conventional physiotherapy program was more effective than the conventional physiotherapy program in increasing sensory processing skills in one measure in infants with CVI and CP. This study is limited by its heterogeneous participant population, unclear masking of the assessment, and short duration of follow-up (8 weeks). Infants with different types of CP may cause differences in results because different CP types exhibit different symptoms. Further studies should evaluate SIT's effect on motor development, with longer interventions.

Omairi et al. (2022) conducted an RCT to evaluate the outcomes of occupational therapy using ASI in a sample of Brazilian children with ASD. Overall, 17 children with ASD who were aged 5 to 8 years (n = 9 in the intervention group; n = 8 in the usual-care control group) completed pretreatment characterization and baseline measurement. The intervention group received occupational therapy using ASI, and the control group received usual therapeutic and educational services only. Participants received the intervention in 60-minute sessions three times per week for 10 weeks. The authors conducted a pre-post assessment of self-care and socialization using the Pediatric Evaluation of Disability Inventory and individualized goal ratings. Participants in the intervention group scored higher on outcome measures of self-care ($p = 0.046$), social function ($p = 0.036$), and parent-identified goal attainment ($p < 0.001$) than the control group. Changes in the other domains were not statistically different between groups. The authors concluded that occupational therapy using ASI was effective in enhancing self-care, socialization, and goal attainment in children with ASD in a Brazilian cohort. Although the evaluators were blinded to group assignment, the parents were not. Thus, it is possible that some bias may have influenced parent-reported outcome measures. In addition, the sample sizes were small in each group, and multiple comparisons were performed. Well-designed, comparative studies that include larger populations of individuals are needed to further describe safety and clinical outcomes.

Randell et al. (2022) conducted a parallel-group RCT (SenITA) to determine the behavioral, functional, and quality-of-life outcomes of SIT in children with autism and sensory difficulties compared with usual care in children in mainstream primary school who had an autism diagnosis and processing difficulties. The exclusion criteria included children who had previous SIT and/or current ABA therapy. Overall, 138 children were randomized via randomized permuted blocks, with 69 each assigned to the intervention group and comparator. The primary outcome that was assessed was improvement in problem behaviors (irritability and agitation). The secondary outcomes that were assessed were adaptive behavior, function and socialization, stress of carers, functional change, and sensory processing. The intervention used ASI therapy, which was administered in 1-hour sessions over a 26-week period via two sessions per week for 10 weeks, then two sessions per month for 2 months, and then one telephone session per month for 2 months. The comparator of usual care included those who were awaiting services or those who were receiving sensory-based interventions that did not meet the criteria as sensory integration. The results showed no statistically significant effects of SIT on the primary outcome after 6 months, and no meaningful improvements were seen at 6 and 12 months across the secondary outcomes assessed (behavioral, adaptive functioning, socialization, carer stress, health utility, or quality-of-life measures). The authors concluded that SIT did not demonstrate superior clinical effectiveness over usual care across all outcomes that were measured. There were some significant improvements observed in boys, as well as children with concomitant ADHD; however, these findings should be considered hypothesis generating only, and future research is required.

Tzang et el. (2019) conducted a population-based cohort study to investigate whether intervention with SIT in children with ADHD was associated with a reduced risk of subsequent mental disorders. From children who were < 8 years old and newly diagnosed with ADHD in a nationwide, population-based dataset, the investigators established an SIT cohort and a non-SIT cohort (n = 1,945) that were matched by propensity score. Incidence and hazard ratios of subsequent psychiatric disorders were compared after a maximum follow-up of 9 years. The incidence of psychiatric disorders was 1.4-fold greater in the SIT cohort, with an adjusted hazard ratio of 1.41 (95% CI, 1.20-1.67), compared with the non-SIT cohort. Risks were elevated for emotional disturbances, conduct disorders, and adjustment disorders independent of age, gender, or comorbidity. Among children with only psychosocial intervention, the incidence of psychiatric disorders was 3.5-fold greater in the SIT cohort than in the non-SIT cohort. The authors stated that to their knowledge, this is the first study to show an increased risk of developing psychiatric disorders in children with ADHD who received SIT compared with other children who did not receive SIT. They further stated that the potential adverse effects of SIT in children with ADHD should be carefully examined. The findings are limited by the observational design of the study.

Kashefimehr et al. (2018) studied the effect of SIT on different aspects of occupational performance in children with ASD. The study was conducted in an intervention group (n = 16) that received SIT and a control group (n = 15) with 3- to 8-year-old children with ASD. The Short Child Occupational Profile was used to compare the two groups in terms of the changes in their occupational performance, and the Sensory Profile was used to assess sensory problems. The intervention group had significantly greater improvement in all the Short Child Occupational Profile domains, as well as in all the Sensory Profile domains, except for the emotional reactions and emotional/social responses domains ($p < 0.05$). The authors concluded that the effectiveness of SIT in improving occupational performance in children with ASD as a

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health-related factor is supported by their findings. Limitations of this study include a small population of individuals, apparent lack of randomization, and lack of long-term follow-up.

Schaaf et al. (2018) conducted a systematic review of three RCTs, one retrospective review, and one single-subject ABA-designed study to evaluate the effects of ASI in children with autism. The authors reported that the evidence is strong and shows that ASI intervention demonstrates positive outcomes for improving individually generated goals of functioning and participation, as measured by the GAS in children with autism. Moderate evidence supports improvements in impairment-level outcomes of improvement in autistic behaviors and skills-based outcomes of reduction in caregiver assistance with self-care activities. Child outcomes in play, sensory-motor, and language skills and reduced caregiver assistance with social skills had emerging but insufficient evidence. This review is limited by the small number of studies and unknown long-term follow-up.

Lecuona et al. (2017) conducted a pre-/posttest study to investigate the effect of ASI on the development of premature infants in the first 12 months of life. A pre-/posttest experimental design was used to randomly divide 24 premature infants from a low socioeconomic setting. Developmental status was determined by the Bayley-III Scales of Infant and Toddler Development, TSFI, and Infant/Toddler Sensory Profile. Infants were divided into a control and experimental group. The experimental group received 10 weeks of ASI intervention. The authors reported that ASI intervention had a positive effect on the sensory processing and development of premature infants, especially in terms of cognitive, language, and motor development. This study is limited by a small sample size, lack of long-term follow-up, and nonrandomization.

Weitlauf et al. (2017) conducted a comparative effectiveness review for the Agency for Healthcare Research and Quality to evaluate the effectiveness and safety of interventions that target sensory challenges in ASD. Overall, 24 studies were identified, including 20 RCTs, one nonrandomized trial, and three retrospective cohort studies. The included studies compared interventions that incorporate sensory-focused modalities with alternative treatments or NT. The authors concluded that sensory-related outcomes were improved in children who were receiving a sensory integration–based intervention compared with those who were receiving usual care or other treatment (low strength of evidence). Motor skills outcomes were improved in children who were receiving sensory integration–based treatment compared with those who were receiving usual care or other treatment (low strength of evidence). This review is limited, as the included studies had small sample sizes and limited duration of the intervention and follow-up after the intervention.

Case-Smith et al. (2015) completed a systematic review to examine the research evidence for SIT and sensory-based intervention in children with ASD and sensory processing disorders. Overall, 19 studies were reviewed; five examined the effects of SIT, and 14 examined sensory-based intervention. Two of the five SIT studies were RCTs; one RCT compared SIT with usual care, one compared SIT with a fine motor activity protocol, and one was a case report. Two RCTs found positive effects with SIT on child performance using GAS scores (effect sizes ranging from .72-1.62); other studies (levels III-IV) found positive effects on reducing behaviors that were linked to sensory problems. Sensory-based interventions were characterized as classroom-based interventions that use single-sensory strategies (weighted vests or therapy balls) to influence a child's state of arousal. The authors concluded that although small RCTs resulted in positive effects with SIT, additional rigorous trials that use manualized protocols for SIT are needed to evaluate the effects in children with ASDs and sensory processing problems. This systematic review is limited due to small samples, a lack of blinding, use of short-term interventions, and a lack of data that examined the retention of intervention gains.

Clinical Practice Guidelines

American Academy of Pediatrics (AAP)

In 2020, the AAP Council on Children With Disabilities published guidelines for the identification, evaluation, and management of children with ASDs. Regarding sensory therapies, the guidelines state that sensory-based interventions may be included in the context of motor and behavioral therapies and in educational settings and that the evidence to support the general use of commonly used sensory-based interventions is limited. Sensory goals may be included in treatment objectives (Hyman et al., 2020; reaffirmed October 2025).

American Occupational Therapy Association (AOTA)

In an updated practice guideline for individuals with ASD (Tomchek and Koenig., 2016; reaffirmed 2024), the AOTA includes the following as interventions for sensory integration:

- ASI to address individualized goal areas, with measurement by GAS scores (B; moderate evidence)
- Multisensory activities to improve occupational performance and behavior regulation (B; moderate evidence)
- ASI to improve sleep, adaptive skills, autism features, and sensory processing (C-I; weak/insufficient evidence)
- Multisensory center and noncustomized sensory diets to improve occupational performance and behavioral regulation (I; insufficient evidence)
- Sound therapies to improve behavioral regulation (I; insufficient evidence)

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- Dynamic seating to improve in-seat and on-task behavior and engagement (I; insufficient evidence)
- Linear movement or tactile input (via surgical brush) to improve learning or behavior (I; insufficient evidence)
- Environmental modifications (e.g., sound-absorbing walls and ceiling with additional halogen lighting) to improve attention behaviors, emotional control, and classroom performance (I; insufficient evidence)
- Weighted vests to support improved behavior or performance in daily life activities (D; not recommended due to ineffectiveness and/or potential harm outweighs the benefits)

Auditory Integration Training

There is limited published literature regarding auditory integration training (AIT). Much of the literature consists of uncontrolled studies, with small numbers of individuals, and treatment protocols have not been standardized. A review of older RCTs is not consistently supportive of a benefit. Supportive findings from two recent RCTs, with important design limitations, that were performed in China and Egypt need to be confirmed independently in U.S. populations, with consideration of the potential cultural component of the intervention. Furthermore, safety concerns have been raised, as this treatment may cause distress and/or damage hearing (American Academy of Audiology, 2010). The efficacy and safety of this training have not been demonstrated by larger studies that include comparison groups using standardized protocols.

Fu et al. (2024) conducted a cross-sectional and longitudinal study to evaluate the effectiveness of Tomatis® auditory stimulation therapy as a possible intervention for ASD. Overall, 90 children who were aged 3 to 8 years and met the eligibility criteria were initially screened, with 33 assigned in the cross-sectional study and 57 assigned in the longitudinal study. In the cross-sectional study, the children were then paired according to their sex, chronological age, and severity of ASD [measured with Childhood Autism Rating Scale (CARS) and ABC]. Finally, in each pair, children were randomly assigned to one of two groups by random draw; participants were randomly assigned to the experimental (17) and control (16) groups, which received either two sessions of Tomatis training or intervention training with placebo music over 34 days. The final analyses excluded two participants who did not undergo a completed Tomatis training assessment after random assignment and one participant who did not have baseline CARS and Autism Behavior Scale (ABC) scores. In the longitudinal study, participants received at least six phases of intervention training over 7.5 months (90 weeks). Overall, 32 participants were excluded because of lost or missing data, and a total of 25 participants ultimately completed the trial. In the cross-sectional study, the experimental group had improvement in symptoms after Tomatis training compared with the control group of children with ASD. The results validated the effect of Tomatis treatment for ASD-related deficits, including perceptual-motor, attentional, social, and emotional issues. Analysis of the Tomatis listening ability curves revealed that compared with the control group, participants in the experimental group had better quality of completion at the end than in the first training period after two training periods; participants' cooperation increased; audiometric curve index scores improved; left- and right-ear curve balance improved and became more symmetrical; the slopes of the curves in the frequency bands flattened; spatial localization errors decreased; and left- and right-ear laterality was reduced. ASD's auditory hypersensitivity hampers social information processing, but Tomatis enhances cochlear frequency selectivity, which aids in capturing relevant auditory stimuli. In addition, the longitudinal study confirmed these findings, which revealed Tomatis training to be effective in clinically treating ASD. This study focused on audiometric indicators and behavioral improvement, which elucidates the mechanisms behind the training's success. Behavioral improvements might stem from Tomatis frequency selectivity, reshaping auditory organ-cortical feedback loops to filter interference and focus on valid information. The authors concluded by stating that the rationale behind Tomatis music training is not yet fully understood but that the results of this study suggest that the brain's unique patterns in various frequency bands may be associated with improvements in behavioral disorders. This study has several limitations. The study discusses the improvement of therapy on the behavior of children with ASD, but future research is necessary to explore the mechanisms involved in Tomatis in depth using electrophysiological means. In the future, the sample and intervention period should be increased, and physiological tests such as auditory evoked potentials, electroencephalography, and magnetic resonance imaging should be combined to explore the robust effects of Tomatis. Secondly, Tomatis training is mainly for children, and it is prudent to generalize the effects of the training to adults with ASD. Other limitations include exclusion of participants after randomization, which could have introduced biases, and questionable generalizability to U.S. populations.

El-Tellawy et al. (2022) conducted a prospective, open-label, randomized, interventional clinical trial to evaluate the efficacy of hyperbaric oxygen therapy and Tomatis sound therapy in an Egyptian cohort of children with ASD. Overall, 146 children with ASD and no previous rehabilitation therapy were enrolled in this study. Participants were randomly divided into four groups. The first group received hyperbaric oxygen therapy; the second group received Tomatis sound therapy; the third group received a combination of both modalities; and the fourth group, which was the control group, received no intervention. The authors found that the combination of Tomatis sound therapy with hyperbaric oxygen therapy had a superior effect in improving autism symptoms compared with each intervention alone (CARS after therapy: 35.04 ±13.38; before the intervention: 49.34 ±17.54; $p < 0.001$). The authors concluded that the combination of both modalities may be helpful for children with ASD. The most distinctive evidence that supports the use of combination therapy for ASD is still

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controversial; however, the study provided some evidence of the benefit of combination therapy in children with ASD. Future studies should use a more sophisticated research design and begin by finding a consistent baseline measure that can be used to evaluate the effects of these therapies for ASD. Limitations of this study include inconsistent baseline measure, a lack of control for baseline values, and absence of double-blinded evaluation. Well-designed, adequately powered, prospective, controlled clinical trials are needed to further describe safety and clinical outcomes.

The Agency for Healthcare Research and Quality published a comparative review on interventions that target sensory challenges in children with ASD. The inclusion criteria were studies that (1) compared interventions that incorporated sensory-focused modalities with alternative treatments or NT and (2) included at least 10 children with ASD who were aged 2 to 12 years. The authors extracted and summarized data qualitatively because of the significant heterogeneity, as well as the strength of evidence. Regarding auditory integration–based approaches, which included evidence in four small RCTs (two with moderate and two with high risk of bias), they concluded that these did not improve language outcomes (low strength of evidence) (Weitlauf et al., 2017).

Sokhadze et al. (2016) conducted a study using the Berard technique of AIT to improve sound integration in children with autism. It was proposed that exposure to twenty 30-minute AIT sessions (total 10 hours of training) would result in improved behavioral evaluation scores, improve profile of cardiorespiratory activity, and positively affect both early (N1, mismatch negativity) and late (P3) components of evoked potentials in auditory oddball task. Overall, 18 children with ASD participated in the study. A group of 16 typically developing children served as a contrast group in the auditory oddball task. The study reflected a linear increase in heart rate variability measures and respiration rate. Comparison of evoked potential characteristics of children with ASD vs those of typically developing children revealed several group difference findings and, more specifically, a delayed latency of N1 to rare and frequent stimuli, larger mismatch negativity, higher P3a to frequent stimuli, and, at the same time, delayed latency of P3b to rare stimuli in the autism group. Parental questionnaires demonstrated improvements in behavioral symptoms such as irritability, hyperactivity, repetitive behaviors, and other important behavioral domains. The authors concluded that the results of the study propose that more controlled research is necessary to document behavioral and psychophysiological changes resulting from Berard AIT and to provide explanation of the neural mechanisms of how AIT may affect behavior and psychophysiological responses in children with ASD. The findings of this study need to be validated by larger, well-designed studies.

Sinha et al. (2011) conducted a systematic review to evaluate AIT and included six RCTs, which included 171 individuals with autism. Three RCTs did not demonstrate the benefit of AIT over control conditions. The remaining trials identified improvements at 3 months in the AIT group based on improvements of total mean scores for the Aberrant Behavior Checklist, which is of questionable validity. There were no reported significant adverse effects of AIT. The reviewers concluded that more research is needed to determine the effectiveness of AIT for autism.

Clinical Practice Guidelines

American Academy of Audiology (AAA)

A 2010 position statement by the AAA Task Force on AIT concludes that AIT (by any name) is investigational. The academy believes that prospective, systematic research of this technique is needed to demonstrate its efficacy.

American Speech-Language-Hearing Association (ASHA)

The ASHA prepared an evidenced-based technical report regarding AIT (ASHA, 2004). They note that despite approximately one decade of practice, this method has not met scientific standards for efficacy and safety that would justify its inclusion as a mainstream treatment for a variety of communication, behavioral, emotional, and learning disorders.

National Institute for Health and Care Excellence (NICE)

In a guidance document on the support and management of ASD in patients under 19 years of age, NICE (2013; updated 2021) states that AIT to manage speech and language problems in children and young people with autism should not be used.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

The equipment that is used for sensory integration therapy and auditory integration training is not considered medical in nature and therefore not regulated by the FDA.

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Policy History/Revision Information

Date	Summary of Changes
11/01/2026	**Supporting Information** • Updated *Clinical Evidence* and *References* sections to reflect the most current information • Archived previous policy version 2026T0314CC

Instructions for Use

This Medical Policy provides assistance in interpreting UnitedHealthcare standard benefit plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, check the member specific benefit plan document and any applicable federal or state mandates. UnitedHealthcare reserves the right to modify its policies and guidelines as necessary. This Medical Policy is provided for informational purposes. It does not constitute medical advice.

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