One of the core and distinguishing features of autism is differences in sensory processing and modulation. Differences in the ability to process and integrate auditory, tactile, olfactory, visual, proprioceptive, and vestibular input affect the participation in daily routines and activities of autistic individuals, including seeking and receiving medical care. Routine medical care most often involves input in all sensory systems, making it challenging for individuals with sensory processing, integration, and modulation differences to tolerate needed medical interventions. For example, individuals may be sensitive to noise, lights, and tactile input common to medical settings and procedures. Among clinical procedures, improving participation in dental care is especially important for children with autism because poor oral health is more common and receipt of oral care more challenging than for neurotypical peers.

In terms of the mechanism for these differences, the medical community theorizes that increased activation of the sympathetic nervous system and decreased parasympathetic functions may contribute to sensory hyperreactivity for autistic children. Targeting increased input to specific sensory systems may activate the parasympathetic nervous system, which is thought to regulate sensory reactivity and undergirds sensory-integration therapies.

Addressing sensory integration and processing differences and disorders, key to improving care for autistic children, involves determining the sensory profile, integration abilities, and modulation skills of an individual in multiple contexts and guiding modifications to environments and tasks to better match the individual’s needs. These insights have prompted the development of approaches to address the sensory differences that are common among children with autism. For example, guidance exists for making medical settings more accommodating for autistic children and some hospitals have implemented autism-friendly initiatives that include modifying the sensory environment. Without these approaches to address sensory needs, children may forego or fail to tolerate needed medical services, including basic preventive medical and dental care. This is particularly important because autistic youths have much higher frequency of health care visits compared with neurotypical youths.

Despite the importance of addressing the sensory needs of autistic children, few high-quality intervention studies have been conducted to evaluate the effectiveness of sensory modifications to health care environments in improving the experience for these children. A 2021 review identified 30 papers that evaluated interventions to improve health care access or care experiences for people with autism; of these, none were randomized clinical trials. These results underscore the dearth of high-quality randomized trials investigating interventions to meet the needs, including the sensory needs, of autistic individuals who represent nearly 3% of US children.

The study by Stein Duker et al published in JAMA Network Open begins to fill this gap. Study authors describe a program including simple environmental modifications and preparatory social stories to help autistic children aged 6 to 12 years tolerate routine dental cleanings. The intervention group received dental care in a sensory-adapted environment that modified visual, auditory, and tactile inputs. For example, modifications included darkening the environment, playing calming music, and using a butterfly-shaped wrap that included a weighted pediatric dental x-ray vest to create a hugging sensation. Using a randomized crossover design of dental services administered 6 months apart, this trial found that the sensory modifications resulted in significantly lower skin
conduction (suggesting lower sympathetic activation) as well as fewer and shorter observed distress behaviors.

This study is novel in 3 ways. First, it is notable that there was randomization to receiving the sensory-modified dental care or routine care first. Second, the study rigorously confirmed autism spectrum disorder diagnosis and ascertained participant's communication and cognitive abilities, measures of general and dental anxiety, and sensory processing, which were used to compare both groups. Although many intervention studies rely on parent report of autism spectrum disorder diagnosis, this study confirmed the diagnosis and relevant covariates using validated tools. Additionally, the study used a variety of outcome measures, including physiologic measures of stress and anxiety (electrodermal activity), measures of distress that were coded after viewing video recordings, dentist-reported validated measures of anxiety and cooperation, and child-reported measures of pain and sensory discomfort. The inclusion of multiple outcome measures, including biophysical measures, bolstered authors’ findings and understanding of the mechanism (decreased sympathetic activation) of the observed decreases in distress behaviors. Lastly, an implementation checklist was used to ensure fidelity of the package of sensory modifications across participants.

Overall, by applying a rigorous randomized design, this work demonstrates the effectiveness of modifying the environment for individuals with sensory processing differences commonly associated with autism. This is a model that works well in its simplicity and potential for implementation with modest cost and complexity. The strategy, with roots in neurobehavioral theory, may serve as a model for improving medical care provided to autistic children in diverse clinical settings through manualized protocols that incorporate principles of sensory integration. As additional evidence accrues for the effectiveness for low-cost, easy-to-implement sensory interventions such as the one tested by Stein Duker et al.,7 we expect that there will be increasing impetus to universally modify medical and dental settings to better meet the needs of children with autism. If this promise is realized, such approaches ultimately may help to mitigate oral and other health disparities for children with autism.

ARTICLE INFORMATION
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