companies use adult criteria for determining adherence, which further complicates things (46). Even if covered, the supplies are expensive and often require repeated out-of-pocket costs. For children with craniofacial abnormalities, some patients may not be able to find a good-fitting mask, and custom masks are not easy to obtain.

Within the United States and worldwide, inequities exist regarding access to specialists, sleep laboratories, centers for pediatric mask fitting, or home care services. The importance of access to centers with pediatric-specific expertise is higher for children with persistent OSA, who often have medical complexities. In regions with limited access to PSG, treatment with autoadjusting CPAP is encouraged/preferred. Last, at the time of writing, there are large supply chain issues with obtaining CPAP machines, and there has been a global recall on some devices, which has significantly impacted availability (47).

What others are saying. The AAP and the Pediatric Society of New Zealand both recommend the use of CPAP in children with persistent OSA (3, 8).

Remarks/future research opportunities. There is a need for:

- Well-designed studies examining short- and long-term adherence to treatment, with a particular focus on what constitutes acceptable adherence in children.
- Large, multicenter studies focusing on outcomes that have not been adequately targeted (QOL, mood, weight changes, cognitive function, behavioral changes, adverse events, snoring, sleepiness [subjective and Epworth sleepiness scale], oxygen saturation).
- A focus on the long-term impact of CPAP masks on facial growth and the use of custom masks.
- Comparative effectiveness data and cost-effectiveness of CPAP compared with other therapies
- Standardization of variables used to define OSA, such as AHI, oAHI, and respiratory disturbance index, as well as pediatric definitions for effectiveness and adherence.

Question 2: Should children with persistent OSA undergo orthodontic/dentofacial orthopedic treatment?

Background. Rapid maxillary expansion (RME) therapy has been used since 1860 to correct maxillary constriction (also known as transverse maxillary deficiency), which is often clinically manifested as a crossbite. The prevalence of posterior crossbite varies depending on the assessment criteria but can range between 8% and 22% (48). RME is often performed using a cemented intraoral orthopedic appliance, ideally before puberty and after permanent first molars have erupted (typically 6–7 years of age). Activation of the expander screw lasts from 1 to 2 weeks, and the device remains in place for a few more weeks, without activation, to consolidate the expansion achieved. Early treatments are preferred. Of note, maxillary/mandibular advancement surgery is often used to treat pediatric OSA with or without concurrent maxillary expansion; however, the role of bony skeletal surgery is not addressed in this question.

Summary of the evidence (includes description of evidence and quality). We identified two observational studies on maxillary expansion in persistent OSA (Table E2). Guilleminault and colleagues conducted a randomized crossover trial of AT and maxillary expansion (49) in 31 children (average age, 6.5 yr) with enlarged tonsils and narrow maxilla associated with a high and narrow palate. For the purpose of this review, we describe the 16 children who started the trial with AT. Four weeks after AT, the AHI dropped from 12.5 to 4.9 events/h and further decreased to 0.9 after 3 months of maxillary expansion (appliance still in place).

In a retrospective assessment of children who had AT and RME by Guilleminault and colleagues, AT was performed in 601 children, and 377 were considered cured. Of the 224 children with persistent OSA, 121 underwent RME, although only 29 reported follow-ups at pubertal stages. Of these 29 children, the mean age at follow-up was 14.4 years (9 girls and 20 boys), the baseline AHI was 9 events/h, AHI after AT was 3 events/h, and AHI after RME was 0.5 events/h. At the pubertal assessment, nine (seven girls and two boys) children were asymptomatic (mean AHI, 0.5 events/h), and five had loud snoring (mean AHI, 3.1 events/h), with flow limitation and mouth breathing during sleep also seen (49).

School performance was reported in 15/29 children in one study; however, no baseline was reported. Snoring improved in 24/29. Adverse events of RME were also reported. Inability to make clicking sounds with the tongue was reported in 18/29, 15 were unable to protrude their tongue up toward their nose, 6 had difficulties holding a button between their lips, and 2 had difficulty swallowing liquids (50).

When combined, the mean improvement in AHI was 3.3 events/h (95% Confidence interval [CI], 1.8–4.8 events/h), whereas oxygen saturation improved by 2.8% (95% CI, 2.3–3.5%) after RME (49, 50).

We did not find any literature describing the outcomes of OSA resolution, QOL, behavioral changes, mood, weight, or daytime sleepiness in children with persistent OSA treated with RME.

ATS Recommendation 2: We suggest that children with persistent OSA with specific craniofacial features may be considered candidates for orthodontic/dentofacial orthopedic treatment (conditional recommendation, very low certainty in the estimates of the effect). The panel believed these children must also have an indication for orthodontic treatment based on a constricted maxilla (high and narrow palate, and often, but not always, posterior crossbite) and that RME be the preferred therapy.

Justification and implementation. The panel suggests children with persistent OSA be evaluated for maxillary constriction and referred to the appropriate orthodontist/dentofacial specialist for ongoing care if a deficiency is suspected. This is typically best addressed between 6 and 13 years of age. A crossbite may be a diagnostic clue to look for in the nonspecialist's office. Once appropriate evaluation is performed (detailed oral exam, imaging), a decision can be made whether the child is a good candidate for RME. In children with a narrow maxilla and OSA who have access to an orthodontist and dental coverage, as well as behavioral and homecare allowing them to receive the treatment, RME provides a favorable risk-to-benefit profile.

Desirable consequences and their magnitude. RME in children with maxillary constriction leads to a small improvement in OSA in patients with persistent OSA after AT (mean reduction of 3.3 events/h). Additional retrospective research in children with mild to moderate OSA and maxillary transverse hypoplasia demonstrates a more significant improvement of OSA, but the study population and previous treatment are poorly described (51). The panel concluded that if data are extrapolated from children with mild to moderate OSA with narrow maxilla/maxillary transverse hypoplasia/maxillary