

## Policy on Pacifiers

Adopted

2022

### Abbreviations

**AAP**: American Academy of Pediatrics; **AAPD**: American Academy of Pediatric Dentistry; **SIDS**: Sudden infant death syndrome

### Purpose

The American Academy of Pediatric Dentistry (**AAPD**) encourages health care providers to follow evidence-based literature to educate parents about the safe practices, benefits, and risks of pacifier use by infants and children in order to promote healthy growth and development.

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### Methods

This policy, developed by the Council on Clinical Affairs, is based on review of current dental and medical literature, including a search of the PubMed®/MEDLINE database using the terms: pacifier AND emotional development, safety, benefits, malocclusion, crossbite, open bite, fields: all; limits: within the last 10 years, English. Five hundred forty-nine articles met these criteria. Papers for review were chosen from this list and from references within selected articles.

### Background

Sucking behaviors in infants can be a natural reflex to satisfy a physiological (i.e., nutritive) or psychological (i.e., non-nutritive) need. The non-nutritive drive may be satisfied by sucking a finger or thumb or an available object such as a pacifier. Pacifier use is common among infants in the United States.<sup>1</sup> Cultural background may play a role in pacifier introduction.<sup>2</sup> Considerations when counseling parents on introducing pacifiers include safety and potential risks and benefits of pacifier use. Although the American Academy of Pediatrics (**AAP**) has recommended delaying pacifier use in breastfed infants until breast-feeding is established to prevent breastfeeding disruption,<sup>3</sup> a recent Cochrane systematic review found pacifier use, whether started from birth or after lactation, did not affect the prevalence or duration of breastfeeding in healthy, term infants up to four months of age<sup>4</sup>.

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The controlled action of sucking promotes feelings of security<sup>5</sup> and allows infants to self-soothe<sup>5,6</sup> and to initiate the process of self-regulation<sup>6</sup>. Pacifiers may continue to provide comfort in the toddler years. Cessation may be carried out either through self-implementation or caregiver mediation.<sup>7</sup> A recent review found evidence that psychological interventions such as positive and negative reinforcement effectively improve non-nutritive sucking habits in children.<sup>7</sup> Positive reward for pacifier cessation (e.g., recognition or incentive for each day of non-use) is preferable to negative reinforcement (e.g., criticism, restraint) which can inadvertently cause power struggles and extend the duration of non-nutritive sucking habits.<sup>6</sup>

### Risks of pacifier use

Practitioners can provide counseling and anticipatory guidance regarding pacifier selection and safe usage to parents of infants and children who utilize a pacifier. Pacifiers of single piece construction are less likely to break apart and become a choking hazard.<sup>8</sup> For safety, AAP recommends a pacifier shield be firm, have ventholes, and measure at least 1.5 inches across (i.e., large enough not to pass completely into the mouth).<sup>8</sup> Additionally, the United States Consumer Product Safety Commission prohibits straps, cords, or attachments that could pose a danger to infants or children.<sup>9</sup> Regular inspection of the pacifier by caregivers is recommended to evaluate for any structural wear that poses a safety risk.<sup>8</sup>

Pacifier use is a risk factor for otitis media in infants and children.<sup>10-14</sup> The AAP suggests the incidence of acute otitis media may be reduced by decreasing or eliminating use of a pacifier in the second six months of life.<sup>15</sup> Evidence linking pacifier use to issues with speech development or speech delay is limited.<sup>16,17</sup> Recent research suggested that while prolonged day-to-day pacifier use lasting several hours may have significance with atypical speech errors, a strong speech-related justification against pacifier use is not evident.<sup>18</sup> The U.S. Food and Drug Administration recommends that infants and young children not be given pacifiers containing or dipped in honey.<sup>19</sup> Honey contains spores of a particular bacterium, *Clostridium botulinum*, that produces a neurotoxin capable of causing respiratory difficulty, paralysis, and even death.<sup>19</sup> Recent cases of infant botulism in Texas were attributed to commercially-available honey-filled pacifiers.<sup>19</sup>

Pacifiers can serve as a reservoir for microbes, and their use is linked to oral yeast infections.<sup>14,20</sup> Sterilization/disinfection, either by boiling in water for 15 minutes or preferably spraying an anti-microbial agent (e.g., 0.12 percent chlorhexidine), can minimize and eliminate microbes such as *Staphylococcus*, *Candida albicans*, and *Streptococcus mutans*.<sup>16,21,22</sup>

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Children using a pacifier 36 months or longer had a significantly higher incidence of anterior open bite compared to those not using a pacifier.<sup>12,23-32</sup> Pacifier usage beyond one year also leads to a significantly higher incidence of anterior open bite,<sup>15</sup> although an anterior open bite will improve after elimination of the pacifier before age three.<sup>31-33</sup> In addition, increased pacifier use leads to posterior cross-bite,<sup>12,26-31,34,35</sup> including crossbite with midline deviation.<sup>36-39</sup> A prospective study examining pacifier use beyond age four concluded the transverse occlusal relationship should be evaluated before three years of age.<sup>33</sup> To limit the development of a posterior crossbite, discontinuing or limiting pacifier use when canines emerge<sup>38</sup> (approximately 18 months of age)<sup>36</sup> has been recommended.<sup>33</sup> Malocclusion was affected by duration more than frequency,<sup>35,39</sup> and the percentage of open bite was significantly greater as the duration of non-nutritive sucking continued beyond three years of age<sup>34</sup>. Increased overjet and a class II malocclusion are more strongly associated with a finger habit versus a pacifier habit.<sup>33,39</sup>

A systematic review noted orthodontic pacifiers induce less open bite compared to conventional pacifiers.<sup>29</sup> While one study<sup>30</sup> showed conventional pacifiers use exhibited higher odds of posterior crossbite and anterior open bite compared to orthodontic pacifiers, another<sup>28</sup> found pacifier usage had a significantly higher incidence of posterior crossbite versus non-habit children although the difference between pacifier types with regards to posterior crossbite was not significant. A prospective study introduced a pacifier with a thin neck to children (average age 20 months) who had a diagnosed anterior open bite and already used a conventional pacifier; the study group was compared to not only the original pacifier group but also to children not using any pacifier for at least three months.<sup>40</sup> A significant difference regarding overbite and overjet changes between pacifier groups was reported, P less than 0.001 (i.e., the thin neck pacifier resulted in less increase in the overbite and open bite compared to the conventional pacifier); however, no improvement in either pacifier group compared to cessation of pacifier use was found.<sup>40</sup> Two reviews comparing orthodontic versus conventional pacifiers stated evidence was insufficient to support a preference for orthodontic pacifiers preventing malocclusions.<sup>41,42</sup>

The pacifier design (orthodontic, conventional, or physiologic) and shield design (conventional or flare) have implications for the use and function of different brand pacifiers. Pacifiers interact with the palate differently based on their fit (i.e., design and size) regardless of whether they are labeled conventional or orthodontic.<sup>43</sup> Pacifier sizing has been brought into focus for the role it plays in providing palatal support to prevent loss of transverse palatal dimensions and causing palatal collapse.<sup>30,31,43-45</sup> Palatal collapse contributes to the early development of posterior crossbites.<sup>29,45,46</sup> The use of biometrics to aid pacifier selection has shown promise in recent research.<sup>47,48</sup>

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### Benefits of pacifiers use

Based on “good-quality patient-oriented evidence”, the AAP recommends offering a pacifier when an infant is placed to sleep due to its protective effect on the incidence of sudden infant death syndrome (SIDS), but a pacifier should not be forced on resistant infants.<sup>49</sup> This recommendation is supported by other organizations such as the International Society for the Study and Prevention of Perinatal and Infant Death<sup>50</sup> and the Safe to Sleep® campaign of the United States Department of Health and Human Services<sup>51</sup>.

Pacifier use may be beneficial when mothers cannot breastfeed due to medication or severe illness, if infants need early oral stimulation to develop or maintain the sucking reflex, or in neonatal intensive care environments when infants need calming, pain relief, or decreased stress.<sup>52</sup> The benefits of pacifier use also include adjunctive pain relief in newborns and infants undergoing common, minor procedures in the emergency department and reducing the likelihood of a digit-sucking habit.<sup>1,12,16,53-55</sup> Children who started using an orthodontic pacifier before four months old had a lower risk of developing a finger/thumb sucking habit compared to children who began after four months.<sup>56</sup> Because forced early cessation of pacifier usage has been associated with prolonged finger sucking, allowing the habit to continue beyond 14 months of age may help prevent a persistent finger habit.<sup>57</sup>

### Policy Statement

The AAPD supports parents in the decision to introduce a pacifier based on their infant’s needs and parental preference. During the first few months of life, pacifiers may be beneficial in helping premature infants develop the sucking reflex, offering comfort and soothing, providing an analgesic effect during minor invasive procedures, decreasing the incidence of SIDS, and preventing a persistent finger-sucking habit. However, a prolonged pacifier habit after 12 months of age can increase the risk of acute otitis media. Pacifier use beyond 18 months can influence the developing orofacial complex, leading to anterior open bite, posterior crossbite, and class II malocclusion. Understanding the safety, benefits, and risks is critical to counseling parents on the use of pacifiers.

The AAPD encourages additional research regarding the biometrics for pacifier selection to minimize disturbances of the developing orofacial complex.

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