



# Media and Young Minds

COUNCIL ON COMMUNICATIONS AND MEDIA

Infants, toddlers, and preschoolers are now growing up in environments saturated with a variety of traditional and new technologies, which they are adopting at increasing rates. Although there has been much hope for the educational potential of interactive media for young children, accompanied by fears about their overuse during this crucial period of rapid brain development, research in this area still remains limited. This policy statement reviews the existing literature on television, videos, and mobile/interactive technologies; their potential for educational benefit; and related health concerns for young children (0 to 5 years of age). The statement also highlights areas in which pediatric providers can offer specific guidance to families in managing their young children's media use, not only in terms of content or time limits, but also emphasizing the importance of parent–child shared media use and allowing the child time to take part in other developmentally healthy activities.

## INTRODUCTION

Technologic innovation has transformed media and its role in the lives of infants and young children. More children, even in economically challenged households, are using newer digital technologies, such as interactive and mobile media, on a daily basis<sup>1</sup> and continue to be the target of intense marketing.<sup>2</sup> This policy statement addresses the influence of media on the health and development of children from 0 to 5 years of age, a time of critical brain development, building secure relationships, and establishing health behaviors.

## INFANTS AND TODDLERS

Children younger than 2 years need hands-on exploration and social interaction with trusted caregivers to develop their cognitive, language, motor, and social-emotional skills. Because of their immature symbolic, memory, and attentional skills, infants and toddlers cannot learn from traditional digital media as they do from interactions with caregivers,<sup>3</sup> and they have difficulty transferring that knowledge to their 3-dimensional experience.<sup>4</sup> The chief factor that facilitates toddlers'

## abstract

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learning from commercial media (starting around 15 months of age) is parents watching with them and reteaching the content.<sup>5,6</sup>

The interactivity of touchscreens enables applications (apps) to identify when a child responds accurately and then tailor its responses, thereby supporting children at their levels of competence. Emerging evidence shows that at 24 months of age, children can learn words from live video-chatting with a responsive adult<sup>7</sup> or from an interactive touchscreen interface that scaffolds the child to choose the relevant answers.<sup>8</sup> Starting at 15 months of age, toddlers can learn novel words from touchscreens in laboratory-based studies but have trouble transferring this knowledge to the 3-dimensional world.<sup>9</sup> However, it should be noted that these experiments used specially designed apps that are not commercially available.

Many parents now use video-chat (eg, Skype, FaceTime) as an interactive media form that facilitates social connection with distant relatives. New evidence shows that infants and toddlers regularly engage in video-chatting,<sup>10</sup> but the same principles regarding need for parental support would apply in order for infants and toddlers to understand what they are seeing.

In summary, for children younger than 2 years, evidence for benefits of media is still limited, adult interaction with the child during media use is crucial, and there continues to be evidence of harm from excessive digital media use, as described later in this statement.

## **PRESCHOOL MEDIA AND LEARNING**

Well-designed television programs, such as Sesame Street, can improve cognitive, literacy, and social outcomes for children 3 to

5 years of age<sup>11,12</sup> and continue to create programming that addresses evolving child health and developmental needs (eg, obesity prevention, resilience). Evaluations of apps from Sesame Workshop and the Public Broadcasting Service (PBS) also have shown efficacy in teaching literacy skills to preschoolers.<sup>2</sup> Unfortunately, most apps parents find under the “educational” category in app stores have no such evidence of efficacy, target only rote academic skills, are not based on established curricula, and use little or no input from developmental specialists or educators.<sup>2,13</sup> Most apps also generally are not designed for a dual audience (ie, both parent and child).<sup>2,14</sup> It is important to emphasize to parents that the higher-order thinking skills and executive functions essential for school success, such as task persistence, impulse control, emotion regulation, and creative, flexible thinking, are best taught through unstructured and social (not digital) play,<sup>15</sup> as well as responsive parent-child interactions.<sup>16</sup>

Digital books (also called “eBooks,” books that can be read on a screen) often come with interactive enhancements that, research suggests, may decrease child comprehension of content or parent dialogic reading interactions when visual effects are distracting.<sup>17</sup> Parents should, therefore, be instructed to interact with children during eBook reading, as they would a print book.

## **HEALTH AND DEVELOPMENTAL CONCERNS**

### **Obesity**

Heavy media use during preschool years is associated with small but significant increases in BMI,<sup>18</sup> may explain disparities in obesity risk in minority children,<sup>19</sup> and sets the stage for weight gain later in childhood.<sup>20</sup> Although many

studies have used a 2-hour cutoff to examine obesity risk, a recent study of 2-year-olds found that BMI increased for every hour per week of media consumed.<sup>21</sup> It is believed that exposure to food advertising<sup>22</sup> and watching television while eating (which diminishes attention to satiety cues)<sup>23</sup> drives these associations.

### **Sleep**

Increased duration of media exposure and the presence of a television, computer, or mobile device in the bedroom in early childhood have been associated with fewer minutes of sleep per night.<sup>24</sup>

Even infants exposed to screen media in the evening hours show significantly shorter night-time sleep duration than those with no evening screen exposure.<sup>25</sup> Mechanisms underlying this association include arousing content<sup>26</sup> and suppression of endogenous melatonin by blue light emitted from screens.<sup>27</sup>

### **Child Development**

Population-based studies continue to show associations between excessive television viewing in early childhood and cognitive,<sup>28–30</sup> language,<sup>31,32</sup> and social/emotional delays,<sup>33–36</sup> likely secondary to decreases in parent-child interaction when the television is on<sup>37</sup> and poorer family functioning in households with high media use.<sup>37</sup> An earlier age of media use onset, greater cumulative hours of media use, and non-PBS content all are significant independent predictors of poor executive functioning in preschoolers.<sup>38</sup> Content is crucial: experimental evidence shows that switching from violent content to educational/prosocial content results in significant improvement in behavioral symptoms, particularly for low-income boys.<sup>12</sup> Notably, the quality of parenting can modify associations between media use and child development: one study found that inappropriate content

and inconsistent parenting had cumulative negative effects on low-income preschoolers' executive function, whereas warm parenting and educational content interacted to produce additive benefits.<sup>39</sup>

Child characteristics also may influence how much media children consume: excessive television viewing is more likely in infants and toddlers with a difficult temperament<sup>40,41</sup> or self-regulation problems,<sup>42</sup> and toddlers with social-emotional delays are more likely to be given a mobile device to calm them down.<sup>43</sup>

### Parental Media Use

Parents' background television use distracts from parent-child interactions<sup>44</sup> and child play.<sup>45</sup> Heavy parent use of mobile devices is associated with fewer verbal and nonverbal interactions between parents and children<sup>46</sup> and may be associated with more parent-child conflict.<sup>47</sup> Because parent media use is a strong predictor of child media habits,<sup>48</sup> reducing parental media use and enhancing parent-child interactions may be an important area of behavior change.

### CONCLUSIONS: CLINICAL IMPLICATIONS

In summary, multiple developmental and health concerns continue to exist for young children using all forms of digital media to excess. Evidence is sufficient to recommend time limitations on digital media use for children 2 to 5 years to no more than 1 hour per day to allow children ample time to engage in other activities important to their health and development and to establish media viewing habits associated with lower risk of obesity later in life.<sup>49</sup> In addition, encouraging parents to change to educational and prosocial content and engage with their children around technology

will allow children to reap the most benefit from what they view.

As digital technologies become more ubiquitous, pediatric providers must guide parents not only on the duration and content of media their child uses, but also on (1) creating unplugged spaces and times in their homes, because devices can now be taken anywhere; (2) the ability of new technologies to be used in social and creative ways; and (3) the importance of not displacing sleep, exercise, play, reading aloud, and social interactions. Realistically, pediatric providers will need to know how to help parents find resources finding appropriate content, tools for monitoring or limiting child use, ideas for play or activities in which to engage rather than digital play, and how parents can limit their own media use (see HealthyChildren.org for examples); each of these can be built into the Family Media Use Plan (see the American Academy of Pediatrics guide to developing a plan at [www.healthychildren.org/MediaUsePlan](http://www.healthychildren.org/MediaUsePlan)).

### RECOMMENDATIONS

#### Pediatricians

- Start the conversation early. Ask parents of infants and young children about family media use, their children's use habits, and media use locations.
- Help families develop a Family Media Use Plan ([www.healthychildren.org/MediaUsePlan](http://www.healthychildren.org/MediaUsePlan)) with specific guidelines for each child and parent.
- Educate parents about brain development in the early years and the importance of hands-on, unstructured, and social play to build language, cognitive, and social-emotional skills.
- For children younger than 18 months, discourage use of screen media other than video-chatting.

- For parents of children 18 to 24 months of age who want to introduce digital media, advise that they choose high-quality programming/apps and use them together with children, because this is how toddlers learn best. Letting children use media by themselves should be avoided.
- Guide parents to resources for finding quality products (eg, Common Sense Media, PBS Kids, Sesame Workshop).
- In children older than 2 years, limit media to 1 hour or less per day of high-quality programming. Recommend shared use between parent and child to promote enhanced learning, greater interaction, and limit setting.
- Recommend no screens during meals and for 1 hour before bedtime.
- Problem-solve with parents facing challenges, such as setting limits, finding alternate activities, and calming children.

#### Families

- Avoid digital media use (except video-chatting) in children younger than 18 to 24 months.
- For children ages 18 to 24 months of age, if you want to introduce digital media, choose high-quality programming and use media together with your child. Avoid solo media use in this age group.
- Do not feel pressured to introduce technology early; interfaces are so intuitive that children will figure them out quickly once they start using them at home or in school.
- For children 2 to 5 years of age, limit screen use to 1 hour per day of high-quality programming, coveiw with your children, help children understand what they are seeing, and help them apply what they learn to the world around them.

- Avoid fast-paced programs (young children do not understand them as well), apps with lots of distracting content, and any violent content.
- Turn off televisions and other devices when not in use.
- Avoid using media as the only way to calm your child. Although there are intermittent times (eg, medical procedures, airplane flights) when media is useful as a soothing strategy, there is concern that using media as strategy to calm could lead to problems with limit setting or the inability of children to develop their own emotion regulation. Ask your pediatrician for help if needed.
- Monitor children's media content and what apps are used or downloaded. Test apps before the child uses them, play together, and ask the child what he or she thinks about the app.
- Keep bedrooms, mealtimes, and parent-child playtimes screen free for children and parents. Parents can set a "do not disturb" option on their phones during these times.
- No screens 1 hour before bedtime, and remove devices from bedrooms before bed.
- Consult the American Academy of Pediatrics Family Media Use Plan, available at: [www.healthychildren.org/MediaUsePlan](http://www.healthychildren.org/MediaUsePlan).

## Industry

- Work with developmental psychologists and educators to create design interfaces that are appropriate to child developmental abilities, that are not distracting, and that promote shared parent-child media use and application of skills to the real world. Cease making apps for children younger than 18 months until evidence of benefit is demonstrated.

- Formally and scientifically evaluate products before making educational claims.
- Make high-quality products accessible and affordable to low-income families and in multiple languages.
- Eliminate advertising and unhealthy messages on apps. Children at this age cannot differentiate between advertisements and factual information, and therefore, advertising to them is unethical.
- Help parents to set limits by stopping auto-advance of videos as the default setting. Develop systems embedded in devices that can help parents monitor and limit media use.

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## ABBREVIATIONS

app: application  
PBS: Public Broadcasting Service

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