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Position Statement

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Screen time and preschool children: Promoting health and development in a digital world

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ABSTRACT

COVID-19 transformed the family media environment and spurred research on the effects of screen media exposure and use on young children. This update of a 2017 CPS statement re-examines the potential benefits and risks of screen media in children younger than 5 years, with focus on developmental, psychosocial, and physical health. Four evidence-based principles—minimizing, mitigating, mindfully using, and modelling healthy use of screens—continue to guide children's early experience with a rapidly changing media landscape. Knowing how young children learn and develop informs best practice for health care providers and early years professionals (e.g., early childhood educators, child care providers). Anticipatory guidance should now include child and family screen use in (and beyond) pandemic conditions.

Keywords: Development; Digital media; Health; Infant; Preschool child; Screen time.

BACKGROUND AND METHODOLOGY

The immersion of digital media in Canadian family life increased dramatically throughout the COVID-19 pandemic, renewing concerns about how screen time impacts children and family relationships. This updated statement re-examines the potential benefits and risks of screen exposure and use on children younger than 5 years old.

Screen time is the time spent with any screen, including television, computers, and gaming or mobile devices (smartphones, tablets).
Digital media includes all content transmitted over the Internet or computer networks, on all devices.
Digital media literacy is the ability to critically, effectively, and responsibly access, use, understand, and engage with media of all kinds (1).

Health care professionals and others working with families and young children are increasingly asked for evidence-based guidance on digital media in four main areas: duration of use (how much is too much?) (2), limit-setting, effects on health and well-being, and quality content.

A literature search (3) into the effects of screen media on children younger than 5 years was undertaken in 2021, with focus on studies and guidelines published since 2017. Recommendations are based on evidence and expert consensus. For information on screen time in older children and adolescents, see the CPS statement published in 2019 (4).

THE IMPORTANCE OF EARLY CHILDHOOD EXPERIENCES

Young children develop in an environment of relationships (5), and increasingly these relationships include screens. A child's earliest screen encounters are formative because patterns of exposure and use (6–8) are habit-forming and known to track into later life (8–12). Because screens are largely controlled by parents, children's exposure is more easily modifiable at this age than later on (8,13). Limits are essential because babies and toddlers attend to screens in ways that can impact language acquisition, cognitive development, and socio-emotional health (6–10).

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Among the trends in early childhood viewing patterns:

- Increasing use of screens in young children are linked to changing levels of physical activity, sedentary behaviour, and sleep (14).
- Nearly all children in Canada are exposed to screens by the age of 2 (15) and only 15% of Canadian children aged 3 to 4 years meet screen time guidelines of <1 hour/day (16). Even before COVID, the average parent-reported screen time for this age group was 1.9 hours/day (17,18).
- TVs, tablets, and video portals like YouTube dominate total screen time for this age group (19–23). A 2018 Alberta study showed children at 2, 3, and 5 years old watching about 17, 25, and 11 hours of TV per week, respectively (or about 2.4, 3.6, and 1.6 hours per day) (24). Many preschoolers use screens at home *and* in child care (9,25).
- In the United States, most 2-year olds use a digital device daily, and 9 of every 10 children are introduced to a device before their first birthday (26). One recent study reported a 60% rate of touchscreen device use in children younger than 3 (27,28).
- A 2020 U.S. survey found that nearly 4 in 10 parents (39%) say the television is either 'always' on (10%), or on 'most of the time' (29%). In those households, young children also consistently watch far more TV than other children their age (23), with developmental risks described below.

IMPACTS OF SCREEN MEDIA ON DEVELOPMENT

Evidence for neuroanatomical and physiological changes to the developing brain related to early, intensive exposure to screen media remains mixed (29–31), but research on how (and how much) children younger than 5 years of age actually learn from screens has advanced in recent years (32–38). Although babies cannot absorb screen content, digital media can catch and hold their attention. Children under 2 years old can remember brief sequences and imitate screen behaviours and emotions (23,33). While toddlers are beginning to understand TV content by the end of their second year (9,39), they still have difficulty transferring what they see from screens to real life, and do not learn efficiently from screen media (23,40–42). By contrast, they learn intensely through face-to-face interaction with parents and caregivers: Early learning is easiest, most enriching, and most efficient developmentally when experienced live, interactively, in real time and space, and with real people (43–47).

Potential benefits for development

The pandemic highlighted two beneficial screen activities for babies, toddlers, and families: interactive video-chats and virtual story times. Parents and children can share experiences involving digital devices by singing along with songs on YouTube, playing games, or exploring apps together (48). A recent study showed that when measured on vocabulary and story comprehension, preschool children understood and learned equally well from dialogic reading over video chat compared with traditional book sharing (49). For children 2 to 4 years old, quality screen media—well-designed, age-appropriate content with specific educational goals—can provide an additional route to early language and literacy (50) as well as play (51). Quality TV programming is known to foster aspects of cognitive development, including prosocial attitudes and imaginative play (33,52).

Some evidence suggests that interactive media, specifically applications that involve contingent responses from an adult (i.e., timely reactions to what a child says or does), can help children learn. This responsiveness, when coupled with age-appropriate content, timing, and intensity of action, can teach new words to 24-month olds (32,37,39,53). There is evidence too that interactive 'learn-to-read' apps and e-books can build early literacy by providing practice with letters, phonics, word recognition, and story comprehension (37,54–56). One recent study has suggested that tablet training with an educational game app can foster sustained attention in children 3 to 4 years old (57). However, while screens may help with learning when quality content is co-viewed (58,59), preschoolers learn expressive language and vocabulary *best* from live, direct, and dynamic interactions with caring adults (20,60,61).

Risks for development

As an early marker of developmental risk, language delay in preschoolers is a closely studied correlate of screen time. One recent meta-analysis clearly associated greater quantity of screen use and exposure (including background TV) during infancy with lower language skills at 3 to 4 years of age (62). Research examining TV exposure, whether on a big screen or tablet, has consistently correlated greater amounts of early screen exposure with delayed acquisition of language and lower vocabulary and grammar scores (20,43,62,63). One recent Canadian study found a significant negative association between mobile media device use and expressive language use in children 18 months old (64). Evidence of an association between screen time and attentional difficulties remains mixed (23,65), but a recent study of cumulative media use has related exposure to multiple media forms with decreasing focused attention during toddlerhood (66). Focused attention is considered foundational for the development of executive function abilities in later childhood (66), and toddlerhood may be a critical period for establishing these skills (67).

High exposure to background TV is known to negatively affect language use and acquisition, cognitive development, and foundational executive function skills (i.e., attention, working memory, impulse-control) in children younger than 5 years. Background TV has also been shown to reduce the amount and quality of parent–child interaction and distract children from play (23,39,61,68,69). Despite some evidence for increasing children's reading engagement, parents appear to interact less about story elements with children when reading from e-books. Emerging evidence appears to show that interactive screens diminish rather than enhance opportunities for parent–child interactions (62,70). Further, e-book sound effects and animation can interfere with story comprehension and event sequencing in preschoolers, when compared with printed book sharing (37,71–74).

Prolonged screen exposure and use is associated with decreasing a child's opportunities to develop optimally (24) and with lower cognitive abilities, specifically attention, early reading skills, and language development (20,25,36,62,64–66,71,75–77).

A longitudinal study related higher screen use per week at 24 months of age with lower reading activities at 36 months, and further associated the latter with higher screen use at 60 months. This finding indicates that children's screen use may directly interfere with their reading activities, and sociodemographic factors do not appear to modify either association significantly (75).

What makes the difference? Minimizing and mitigating screen time

There are no established benefits of media exposure for infants and toddlers, with the exception of interactive video-chatting to support long-distance relationships (20,24,25,36,39,43,53,62,64,66,78).

When children watch educational, age-appropriate content with an engaged adult, screen time can be a positive learning experience by:

- Connecting what is being viewed with real life, encouraging interaction, and building cognitive skills such as attention, memory, and thinking (23,69,79). Shared screen time also avoids the disadvantages of solitary viewing, which include exposure to violent or age-inappropriate content (9,80).
- Prioritizing educational content or apps, avoiding mainstream or commercial programs, and using a media classification rating (e.g., the Canadian Home Video Rating System) to guide viewing choices. CBC Kids in Canada and Common Sense Media in the United States are further resources.
- Combining touch screen use with creative or active play (81,82), such as singing, dancing, or language repetition.

THE PSYCHOSOCIAL IMPACTS OF SCREEN MEDIA

Parents can positively influence children's language, social adaptive skills, sleep patterns, and behaviours by setting limits on family screen time (39,83). Research also suggests that as media devices increase in number per household and portability, co-viewing may be happening less (62,84–86). Many 3- and 4-year olds use mobile devices without help (22,26,51).

Individual and family factors may combine with environmental stressors such that parents over-rely on digital media to cope, influence their children's mood or behaviour, or both (51,87–90).

Potential psychosocial benefits

Quality content can enhance social and language skills for all children aged 2 years and older, and particularly benefits children living in poverty or otherwise disadvantaged (43,50). Well-designed, age-appropriate educational programs, and screen activities can be powerfully pro-social, helping children to learn antiviolence attitudes, empathy, tolerance, and respect (52,91).

Emerging research suggests that app and tablet use by children age 3 and younger has potential to foster play and creativity, including the use of expressive language, music, and art (82,92). When appropriately used, mobile devices can provide opportunities for interaction (e.g., playing games, sharing photos) that may involve executive function via memory, planning, and self-control (67,92).

Appropriately used, screen time may help distract a child who is overexcited or distressed (e.g., during a medical procedure) (93,94) or make a long wait easier (51). Developing a family media plan can help protect and reinforce quality family time (95,96). Planning should: begin prenatally; account for the health, education, and entertainment needs of each child and family member; include screen-based activities in child care; and be reviewed periodically. Setting meaningful limits when children are young and sharing them as a family is far easier than cutting back screen time later on. Studies have found that parents' comfort level with saying 'no' to their children's requests for screen time, along with their own media-related beliefs, intentions, and attitudes, are key components of constructive, positive limit-setting (8,13,87,97). For children—and parents—off-screen time is critical for developing essential life skills such as self-regulation (98), creativity, and learning through physical and imaginative play.

Psychosocial risks

There is a strong association between parents' screen time and that of their children, suggesting that media use displaces or interferes with quality, face-to-face parent–child interactions (13,25,99–101). 'Technoference'—the frequent interruption of routines, play, or interactions by digital media use (frequently a parent's device)—has emerged as a risk factor (20). Studies have linked time spent by parents on their mobile devices with the frequency of attention-getting behaviours, 'acting out', and negative interactions with children (23,102). Frequent use of a phone to reward or distract 1- to 4-year olds can lead to children asking for phones—and becoming upset if refused—more often (93,103). However, the highest cost of too much screen time for young children is the loss of opportunities for social learning and practice (89). The routine use of devices to distract or calm may preclude self-soothing strategies and lead to overdependence on screens for emotion regulation (89,104). Lower child self-regulation has been associated with increased screen exposure at 2 years of age (98).

Higher amounts of screen time in preschoolers have also been shown to increase externalizing behaviours and psychosocial difficulties. Children who used apps for more than 30 minutes/day had significantly lower inhibition scores compared to those with less use (105). Excessive screen time (more than 2 to 3 hours/day on any device) has been moderately associated with greater emotional lability and lower self-regulation in preschoolers (106,107), especially when they viewed alone (43,98,107). A recent Irish study clearly associated screen time exposure with internalizing behaviours in preschoolers, suggesting that at these ages, screen time and internalizing behaviours are mutually reinforcing (89).

One recent British study found that screen time at age 2 was negatively associated with the development of executive function—which affects social learning and skills—one year later. This lag may be explained by the frequency with which screens displace children's play and other social activities that are key for developing cognitive skills, including executive function (67).

Other recent studies have found that screen time can negatively affect social skills in early childhood and interfere with social learning (105,108–111). One recent study found that TV and/or video viewing for 3 hours/day at 12 months, when compared with no viewing, was modestly associated with greater autism-like symptoms (but not autism risk), as measured by the Modified Checklist for Autism in Toddlers (M-CHAT) at 2 years. By contrast, increased parental play with children every day was significantly associated with fewer autism-like symptoms (108). These behavioural effects are more pronounced in children with special neurodevelopmental needs and are often self-perpetuating because parents are more likely to use screen media to pacify a child with challenging behaviours (39,98,112). Using screens to calm and manage a child's evening and bedtime routines may lead to further resistance, impede self-regulation skills, and reduce sleep quality (113).

The negative impacts on executive function from early exposure to fast-paced, violent, or otherwise inappropriate content have been well established (9,80), and are partly attributed to the inability of young children (especially those younger than 2 years) to distinguish everyday reality from what happens on screen (23,114).

What makes the difference? Mindful use of screen time

Given the choice, children will nearly always opt for talking, playing, or being read to over screen time in any form (39). By using screen time *mindfully* (more intentionally), parents and caregivers:

- Actively enhance—and limit—media encounters by choosing them together and purposefully ('Let's watch or play *this* content, *at this time, for this reason*').
- Limit screen use in public places and during family routines, such as at meals. Family times are prime opportunities for social learning.
- Select content from quality, non-commercial sources, to minimize exposure to advertising.
- Pay attention to messages about gender, body image, violence, diversity, and social issues when choosing content (115–119).

THE IMPACTS OF SCREEN MEDIA ON PHYSICAL HEALTH

Total sedentary time may have a negligible impact on health in the early years, but research continues to show that less screen-based sedentary behaviour is better for optimal health (12,120). Data from a large 2016 study found that Canada's 3- to 4-year olds were sedentary, on average, for about 60% of their waking time, with an average 2 h taken up by screens. Pre-pandemic, only 15% of 3- to 4-year olds in Canada were meeting 24-hour movement guidelines for both physical activity (PA) (≥180 minutes/day) and screen time (≤1 hour/day) (15). Some evidence suggests improved activity levels in this age group since, even during the pandemic. Statistics Canada in June 2020 found that although three in four parents reported daily screen time by preschool children, they were also participating daily in other activities, including reading books or stories (85%); physical activity (75%); playing games (36%); music, drama, or visual arts (33%); and developing other skills (23%) (121). A recent German study showed an overall increase in habitual PA among children during the pandemic (122).

Potential benefits for physical health

While some apps and games are activity-based and designed to encourage and complement PA (81,82,123), newer technologies may complement or stimulate play, such as by asking a 'smart speaker' to count to 10 for a game of hide-and-seek (51,124–126). Young children engage in active digital play when it is fun, relatable, and encourages imitation or participation (126,127). Active video games can increase light-to-moderate intensity PA, heart rate, and overall energy expenditure in short-term bursts (128). Families and child care programs may use fun, age-appropriate movement (e.g., yoga or dance) and fitness apps or console games to integrate more PA into daily routines (123,129,130). A recent study of 'exergaming' in preschool settings showed a positive effect for promoting moderate-to-vigorous PA with potential to enhance self-competence and motor skills in young children (131). Active touchscreen use has been associated with earlier achievement of fine motor milestones (132).

Mobile devices with apps for exploring nature have been shown to enhance play outdoors (81,82). For children this age, quality educational content connects on- with off-screen experiences, can foster engagement with caregivers and peers, and can support active, imaginative play (123,125,130,133).

Risks for physical health

While screen time and individual measures of weight gain (e.g., body mass index or skin folds) are not strongly associated in preschoolers (13), risks for being sedentary or overweight, including early, prolonged screen exposure and use, persist into later life (9,12,23,25,134,135). A 2017 systematic review found that screen time was associated with a range of health indicators, including adiposity, motor and cognitive development, and psychosocial health (120). Another emerging health concern is the risk of developing myopia related to spending more time on screens and less time outdoors (12,136,137).

Higher amounts of screen time in preschoolers have been inversely related to their fundamental motor skills performance and lower manual dexterity performance on standardized testing. Low scores were noted in children as young as 3 years old and particularly in boys (138).

Commercial TV exposes young children to advertisements for unhealthy foods and encourages snacking, both known to increase overall intake and prompt less healthy food choices (23,139–141). When parents are distracted by their phones during meals, they are less likely to encourage trying new foods and more likely to overfeed young children (103). A recent study of 5- and 6-year olds confirmed that screen time and unhealthy dietary behaviours 'cluster' and correlate in children as young as 5 years old (142). Another study found that when parents used screens during mealtimes, their young children's total screen time on weekdays was significantly higher (13).

A 2018 Canadian survey found that 33% of children 0 to 4 years old used digital technology in the hour before bed (and 24% after bedtime) on every or most weekdays (143). Associations between screen time before bedtime and sleep problems have been more consistent in this age group than those related to PA or weight gain (23,144). Less sleep overall, shorter nighttime sleeps (and more daytime napping), later bedtimes, delayed sleep onset, and greater sleep resistance can impact child development and family function (113,145,146). Evidence is growing that the volume and nature of screen time—rather than content—alter sleep patterns (77,115,145,147,148), and that screen time may be displacing sleep (90). Having screen media in children's bedrooms has been strongly associated with fewer minutes of sleep per night due to aroused response to screen viewing, melatonin suppression, and sleep displacement combined (43,144,145).

What makes the difference? Modelling screen time

Children younger than 5 years require active play and quality family time to develop essential life skills, such as language, self-regulation, and creative thinking. When parents model healthy screen habits, they:

- Minimize their own screen use around young children, especially during mealtimes, play, and other prime opportunities for social learning.
- Prioritize interactions with children through conversation, play, and healthy, active routines.
- Decide when to use media together and turn off screens when not in use.
- Ensure that media used in the presence of children is free of stereotyping, advertising, or other problematic content.

RECOMMENDATIONS

To promote child health and development in a digital world, health care providers and early years professionals should be aware of screen media's earliest impacts and offer anticipatory guidance for families on appropriate screen time practices. Evidence is growing that early childhood can be a critical time to prioritize interventions that prevent problematic screen use. Encouraging caregiver involvement and interaction can help families use digital media in positive (educational, imaginative, and playful) and safer ways.

More specific recommendations for families include the following:

Minimize screen time:

- Screen time for children younger than 2 years is not recommended apart from video-chatting with caring adults. There is no evidence to support introducing technology at an early age.
- For children 2 to 5 years, limit routine or sedentary screen time to about 1 hour or less per day.
- Ensure that sedentary screen time is not a routine part of child care for children younger than 5 years.
- Maintain daily screen-free times, especially for family meals and book-sharing.
- Avoid screens for at least 1 hour before bedtime, given the potential for stimulating and melatonin-suppressing effects.

Mitigate (reduce) the risks associated with screen time:

- Be present and engaged when screens are used and, whenever possible, co-view with children to model and encourage digital media literacy. Help children recognize and question advertising messages, stereotyping, and other problematic content.
- Be aware of content and prioritize educational, age-appropriate, and interactive programming. Encourage the use of screen devices for creative activities, such as drawing, over passive viewing.
- Use parenting strategies that support self-regulation skills in children, without relying on screen-based media.
- Curate and monitor young children's media use by creating playlists or selecting appropriate channels, especially on open platforms such as YouTube. Limit children's exposure to advertising and commercialized content.

As a family, ***be mindful*** about the use of screen time:

- Conduct a self-assessment of current screen habits and develop a family media plan for when, how, and where screens may (and may not) be used.
- Prioritize shared family media use (watching TV or movies together, playing video games together with family and friends) over solitary use by children.
- Encourage older siblings to help 'mentor' younger children's digital encounters, and maintain digital media use as a sociable family activity.
- Remember: Too much screen time means lost opportunities for teaching and learning.

Adults should ***model*** healthy screen use:

- Encourage and participate in activities unrelated to screens, such as shared reading, outdoor play, easy board games, and crafts.
- Turn off devices during family time at and away from home.
- Turn off screens when not in use and avoid background TV.
- Advocate in child care settings and schools, and to local governments, for healthier screen use policies.

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CANADIAN PAEDIATRIC SOCIETY DIGITAL HEALTH TASK FORCE (2021-2022)

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