

How Does Technology Affect A Developing Brain?

The American Academy of Pediatrics recommends the following guidelines for technology:

Less than TWO hours a day for kids age 5-18

No more than ONE hour a day for kids age 2-5

NONE for kids younger than 18 months of age

NOTE: This includes the **combined amount of time throughout the day including school, home, car, etc.*

Why Does There Need to be a Limit on Technology Use in Children?

1. There is a negative impact on developing the part of our brain used for socially appropriate responses and modifications of emotions. Children who have had excessive exposure to technology (iPads, mobile phones, etc.) demonstrate difficulty interacting with others, socializing and controlling their emotions.
2. Technology, like other reward systems, can over-release a “feel good” chemical called dopamine. Similar to when we eat a delicious piece of cake and then want to have more of it. The more dopamine they are exposed to, the more tolerance they build up. The higher the tolerance, the more they crave it to get the same response.
3. Technology puts an obstacle in the way of the natural development of executive function skills such as the ability to plan, organize, manage time, inhibit inappropriate actions or responses, develop good judgement, control impulses, and gain the skills necessary for multi-tasking (working memory). The result is a “double whammy”; the over-release of dopamine creates a craving for more stimulation, but the impaired development of executive function skills impairs their ability to judge when or if they should use technology and for how long.
4. The brain is wired for a “fight or flight” response. This is a normal biological response that is designed to be *short* term. For example, if you are being chased by a bear your body produces the adrenaline needed to escape danger. However, when engaged in technology for hours, the body stays at the heightened level of stress. The more our bodies stay in a “fight or flight” stressful operating mode - the more our bodies stay in a “fight or flight” operating mode.
5. Another area of the brain that is impacted is the development of myelin which is used to make tasks easier the more they are repeated. A good comparison can be made to using a sled on a snowy hill. The first time you sled down a snowy hill and make fresh tracks on the snow, the sled moves slowly and inefficiently while it forms the grooves in the snow. However, with each trip down the hill in those same grooves, the sled moves more easily and faster. Overstimulation that comes from the glow of the screen, the changing lights and colors and the speed with which images appear in technology damages the myelin in the brain and is difficult to overcome.
6. Socially, technology can negatively impact a child’s ability to develop and understand relationships with other people. When children aren’t spending time with peers, they aren’t developing play skills, problem solving skills, self-regulation, emotional regulation and having the face-to-face interactions that are necessary for developing social skills which can only be learned as a result of interactions and feedback from others. The less they interact with other people, the more impaired their social skills. The more impaired their social skills, the more difficulty they have developing relationships.
7. Empathy means feeling WITH people and this is negatively affected when children spend the majority of their time not engaged with people. When children spend the majority of their time in a culture of video game violence, they become desensitized to violence. When children are engaged of a culture of exaggerated cartoon-like experiences, the less they are able to recognize the facial expressions and body language of actual humans. Disproportionate amounts of time spent in a non-human culture can negatively influence a child’s ability to recognize human emotions and to know how to respond to them appropriately.
8. Screens are 100% within the control of the user. If the game isn’t going well, the user can turn it off. If a particular video isn’t interesting, the user can just find another. When young children spend large amounts of time interacting with things that are within their control, they do not learn the strategies and perseverance skills necessary to deal with situations that are out of their control. Children learn to calm themselves and regulate their body and emotions through feedback and practice; not by controlling the world around them.

9. When parents look at screens or use screens to entertain children instead of engaging in conversation or playing with children, there is a negative impact on both the quantity and quality of communication. The research is clear that conversation during the early years lays the foundation for academic success.
10. The National Institute of Health has begun a multi-year study of the impact on technology on a child's brain. The first results show that kids who spend more than two hours a day on screens scored lower on language and thinking tests. Kids who spend more than seven hours a day in front of screens and devices show *premature thinning of the part of the brain* (cerebral cortex) responsible for intelligence, personality, motor development, planning and organizational skills, as well as language and sensory development.

There is a Need for Concern When Children...

- ...are not able to balance screen time with time spent in human interactions
- ... demonstrate extreme irritability or aggression when screens are removed
- ... view their world from the lens of a specific game/app/video
- ... rush through required tasks in order to return to technology
- ... exhibit poor sleep patterns
- ... struggle to have the same amount of attention, problem solving skills and stamina for activities that are not technology related
- ... show symptoms of impaired social interactions with peers
- ... have difficulty controlling their emotions
- ... need technology to calm down
- ...consistently request technology over other free time and play activities

When these concerns occur, there is a need to reset a hyper-aroused nervous system.

To accomplish this, the brain often needs four to six weeks of time spent without any screens.

What About Educational Apps?

- There are more than 700,000 educational apps and 80% or more of them are targeted specifically towards young children. Many claim to help children learn to read; but many do not. They may teach a child how to recognize letters, but that doesn't mean they can blend sounds to form words. They may teach your child to count to 10, but that doesn't mean that they can show you a group of 10 blocks. In short, many apps are just glorified flash cards that do not add the *depth* of knowledge necessary to build a strong foundation for learning. **When it comes to teaching children; nothing is more important, valuable or effective than human interaction.**

Tips and Suggestions:

- Go on a "Digital Diet" - Technology is designed to keep you wanting more. There is research that shows that the "rewards" we receive from technology release a chemical called dopamine every time we increase a level, a favorite visual image pops up or by presenting other things that make us happy. This chemical causes us to want more and more. This is similar to how eating sugary snacks causes us to crave more sugary snacks. A "digital diet" to help control technology "cravings" is a good plan for how to break bad screen time habits. A few tips...
 - Use apps like Forest, Moment or Freedom that monitor/restrict the amount of time technology is used
 - Change your phone settings to grayscale to make it less appealing. On an iPhone or iPad go to -settings, general, accessibility, display accommodations, color filters. Then, go back to accessibility and turn on the accessibility short cut. This allows you to easily switch back to color (for photos, etc.) with a triple click of the home button.
 - Establish "technology free" times and locations: Do not allow technology during meals, while riding in the car, an hour before bed, and remember to balance screen time with active play.
 - **Technology is a tool; not a toy.** Technology is not a cure for boredom, something to soothe a fussy toddler or a replacement for good conversations and interactions that positively impact emotional development, self-control and language development.
 - Replace screen time with reading! **Reading is one of the most important things that you can do with your child.** Children who are read to develop imagination, have improved vocabulary, develops listening skills, and it establishes the connection between spoken words and written words (a giant first step in learning to read).



Non-Technology Games and Activities

How Many Can You Check Off in 3 Weeks?



Games/Activities To Do Independently	Games/Activities To Do While Waiting in Line, Riding in the Car, Sitting in _____
<input type="checkbox"/> Read books <input type="checkbox"/> Read books <input type="checkbox"/> Read books <p>(Yes, books are THAT important! Use REAL books, NOT digital)</p> <input type="checkbox"/> Puzzles <input type="checkbox"/> Coloring <input type="checkbox"/> Sorting – sort out the toys in the toy box, sort the laundry, sort the silverware, etc. <input type="checkbox"/> Play-doh <input type="checkbox"/> Make a craft (stringing cereal on a string, or make a collage out of pictures from old magazines glued onto paper, etc.) <input type="checkbox"/> Build with blocks/legos – “How tall can you build this until it falls?” <input type="checkbox"/> Indoor bowling – Set up items that will easily fall over, then roll a ball and see how many you can knock over. Then, set them back up and do it again! <input type="checkbox"/> Try to keep a balloon up in the air by bouncing it with your hand <input type="checkbox"/> Build a fort	<p><i>Fun “Waiting” Games:</i></p> <input type="checkbox"/> Play I Spy <input type="checkbox"/> Play Rock, Paper Scissors <input type="checkbox"/> Play Name that tune <input type="checkbox"/> Play “I’m Going on a Picnic” – “I’m going on a picnic and I am going to take (something that starts with “A”. The next person says “I’m going on a picnic and they say the previous item(s) and then something that starts with the next letter of the alphabet) <input type="checkbox"/> Play “Who Am I” – give clues until they guess who it is <input type="checkbox"/> Alphabet Hunt – while driving see if you can find something that starts with “A”, then “B”, and so on. <input type="checkbox"/> Learn and practice the alphabet in sign language <p><i>Conversation Starters:</i></p> <input type="checkbox"/> Read books or talk about the pictures in a magazine <input type="checkbox"/> Plan what to have for dinner or make out a shopping list together <input type="checkbox"/> Name your <i>top</i> 3 favorite ____ (foods, drinks, books, colors, animals, etc.), then name 3 of your <i>least</i> favorite! <input type="checkbox"/> How many _____ can you think of (animals, foods, fruits, girl’s names, boy’s names, cartoon characters, colors, clothing, weather, etc.) <input type="checkbox"/> Make up Stories – start with “Once upon a time” and each person adds a part to the story <input type="checkbox"/> If you had (\$1, \$5, \$20, \$100, a million dollars) what would you buy? <input type="checkbox"/> Can you name a Disney character, food or animal that starts with each letter of the alphabet
Games/Activities That Encourage Social Interaction	
<p><i>Simple games to play with someone:</i></p> <input type="checkbox"/> Tic Tac Toe <input type="checkbox"/> Charades <input type="checkbox"/> Freeze tag <input type="checkbox"/> Hide and Go Seek <input type="checkbox"/> Simon Says <input type="checkbox"/> Jump Rope Rhymes <input type="checkbox"/> Duck, Duck, Goose <input type="checkbox"/> Red light, green light <input type="checkbox"/> Red Rover, Red Rover <input type="checkbox"/> Play catch <input type="checkbox"/> Play tag <input type="checkbox"/> Play “rock, paper, scissors” <input type="checkbox"/> Guess which hand the ____ is in <input type="checkbox"/> Freeze dance – play music and dance. Pause it, everyone freezes <input type="checkbox"/> Play a memory game (turn cards over, take turns finding matches)	<input type="checkbox"/> Go on a treasure hunt around the neighborhood. What “treasures” can you find? These treasures can be anything from a paperclip on the ground to seeing a shriveled up worm. Get them to notice the world around them! <input type="checkbox"/> Scavenger Hunt – go on a hunt to find a few specific items that you decide on before you leave the house (i.e. a rock, piece of trash, stick, etc.) <input type="checkbox"/> Manners Race – Keep tally marks for every time someone uses good manners. Work towards a reward for the winner. <input type="checkbox"/> Board games and card games such as... Apples to Apples, Scattergories, Pirate Pop Up, Uno, War, Go Fish, etc. <input type="checkbox"/> Challenge Accepted: Kids LOVE a challenge. “Who can clean their room the fastest, I bet you can’t sit quietly for ____ minutes, I bet you can’t build a tower of 5 cans without it falling, etc.” <input type="checkbox"/> Pretend play! Make or wear costumes and pretend to be a _____ <input type="checkbox"/> Let them help – cook dinner, set the table, find items in the store, etc. <input type="checkbox"/> Dinner conversation (talk about your day, ask them 3 things about their day, talk about what is coming up, etc.) <input type="checkbox"/> Pretend to go on a picnic or have a tea party <input type="checkbox"/> Play “Hot Potato” with a small stuffed animal or pair of socks