



By Dr. Doug Fryday

There is no question that recent advancements in technology are beneficial to the advancement of society in an economic and business sense, but is it at the expense of our health?

Millennials are the first generation in history to be exposed to screens and mobile devices throughout all stages of their physiological development. The long-term health effects of these changes are largely still unknown, the science in its infancy.

The latest research from Korea suggests smartphones, tablets, gaming devices, computers and other digital devices could be erasing our short-term memory, especially in teens and young

adults who are attached to their devices upwards of seven hours a day. It is estimated 1.8 billion people own smartphones and use it daily, with the average person checking their phone 150 times a day.

Our society's addiction to technology is literally causing the short-term memory pathways in our brains to deteriorate because of lack of use, robbing children of the necessary components of development.

There are four critical factors necessary to achieving healthy childhood development – movement, touch, human connection and exposure to nature. These types of sensory inputs ensure normal development of posture and the brain, and are necessary

for achieving foundational skills of human development.

AUTONOMIC NERVOUS SYSTEM

The autonomic nervous system is the part of the brain that runs the show in the background and has a gas pedal, which is called the sympathetic nervous system, and a brake, which is called the parasympathetic nervous system. The gas pedal is our survival nervous system and is referred to as our 'fight or flight' nervous system. The brake is the 'rest and digest' relaxation response part

of the nervous system, where all healing takes place.

When your body (the car) is running smoothly and optimally, the gas pedal comes on when it needs to speed up and the brake is applied when it needs to slow down. When the gas and brake are working in harmony we have optimal function, which is health. Anything less has the potential for disease. The problem occurs when the gas pedal (sympathetic nervous system) gets 'stuck' because of chronic recurrent stress, requiring the brain to respond as if every external stimulus in life was a threat. This becomes a habit and I call this 'Pedal to the Metal Syndrome™.'

The age of technology

To what extent are children predisposed to Digital Dementia? How many children are actually using technology and at what ages? Statistics show:

- Elementary aged children get, on average, 7.5 hours a day of entertainment technology, while 75 per cent of these children have TVs in their bedrooms, and 50 per cent of North American homes have the TV on all day (*Kaiser Foundation, 2010*).
- 68 per cent of two-year-olds use tablets, 59 per cent use smartphones, and 44 per cent use video game consoles.
- 24 per cent of two-year olds use technology at the dinner table, an important time for human interaction and family development. By age eight, the percentage of children using technology at the dinner table nearly doubles to 45 per cent.
- By age six, 44 per cent of kids would rather play a game on a technology device than read a book or be read to. By age eight, a majority would prefer that technology is present when spending time with a family member or friend (*The American Speech, Language, and Hearing Association, 2015*).
- Overall, 1.8 billion people own smartphones and use their devices on a daily basis.
- The average person checks their screen 150 times a day.
- 70 per cent of 12-year-olds use a mobile phone and this increases to close to 90 per cent by age 14 (*Williams, 2016*).

FIGHT OR FLIGHT

When young children are exposed to violence through TV and video games, they are in a high state of stress. These physiologic signs are associated with 'fight-or-flight' or a ramped-up autonomic nervous system. With fight-or-flight, the body signals the person to move. Being in this state of stress without being physically active – sitting in front of the TV or computer instead of being outside moving – can have a negative effect on a child's health.

Children who overuse technology report persistent body sensations of overall shaking, increased breathing and heart rate, and a general state of unease – this is anxiety. Chronic stress associated with sitting with poor posture while interacting with technology results in a weakened immune system, developmental delays and a higher predisposition to obesity, the studies show.

When the brain is stressed, your body innately or automatically responds by increasing your heart rate, blood pressure, blood sugar, respiration rate, sweat glands and dilation of the pupils. Secretion of stress hormones cortisol, adrenaline and epinephrine are turned on and up. This response can be lifesaving for short periods of time, but if prolonged, without the appropriate relaxation, it will cause a weakening of the heart, shrinkage of the brain and chronic inflammation, which prevents the formation of new neurons in your brain.

As you can appreciate, driving at full speed for an indefinite period of time will have destructive effects on the internal structure of a car's engine. In the body we call this anxiety, a natural internal response to the external stimuli of stress that serves a purpose. This is good for short periods of time because it puts us in a heightened sense of awareness so we're prepared



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Dr. Doug Fryday D.C.

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for potential threats, but is bad if prolonged. Our goal is not to dismiss it entirely, just make it a healthy, manageable part of our lives.

DIGITAL DEMENTIA

‘Digital Dementia,’ a term coined by top German neuroscientist Manfred Spitzer in his book of the same name, and it refers to the decline in brain function associated with slouched sedentary posture in front of a screen. Digital Dementia is directly linked to cognitive decline, specifically memory loss, lack of concentration, lack of coordination, Attention Deficit Hyperactivity Disorder (ADHD), depression anxiety and anger.

Our brains crave movement and complex activation. Sitting in front of a screen for hours at a time with poor posture is not providing your brain with the complex stimuli it needs to create neuroplastic changes. Performing thought-provoking activities like reading, writing and puzzles are important for brain development. Increased screen time neglects the circuits in the brain that control more traditional methods for learning in the frontal lobe that are typically used for reading, writing and concentration.

It’s not enough to sit with poor posture and read all day. Better brain output is derived from stimulatory brain inputs. Exercise activates the frontal and parietal lobes of your brain, associated with better cognitive development. Research demonstrates that people who engage in regular exercise and who have proper posture have decreased cortisol, the hormone associated with stress, anxiety and weight gain.

The opposite is true when sitting or lying on the couch watching an action thriller or a scary movie on your TV or digital device. While seated, the patient’s body releases hormones associated with fight-or-flight and they have higher levels of cortisol. Their hormones are telling them to move fast, and yet the person continues to remain seated, while overcome with stress and cortisol. This is another sensory disassociation that is diminishing functional output and human development.

HOW TO PREVENT DIGITAL DEMENTIA

If your daily routine requires you to be sedentary, or your preferred form of entertainment is from technology, you should consider making changes to prevent the onset of Digital

Dementia. Posture is declining at the speed of technology, greatly impacting human function and neurocognitive development.

The choices you make impact the physical structure of your body and the development of your brain. Take action to implement these simple changes into your daily routine and you will have better posture, you will feel better, and you will be creating positive neuroplastic changes in your brain.

- Children should engage in at least two to three hours per day of active ‘play’ for adequate sensory stimulation needed for proper development. Limit the amount of time children spend on their devices and encourage them to go outside.
- Have your child sit on an exercise ball or posture cushion while engaging with technology. They are moving and engaging their core muscles while sitting on the ball or cushion. This is much more beneficial for their structural development than being completely sedentary.
- Take ‘posture breaks’ – for 30 seconds every hour you can lean back in your chair with a straight spine and open your chest with your arms out wide, draw the head back and down. Hold this position for 20-30 seconds. While seated, the spine and shoulders tend to round forward, opening the chest cavity against gravity, which will save your posture throughout the day.

LESS SCREENS, MORE PLAY

These recommendations are for kids and adults alike. The act of playing, especially outdoors, activates your sensory and motor cortex from movement and tactile sensation. As you are running around, jumping up and down, and swinging back and forth, you are developing fine motor pathways and are stimulating your vestibular system for better balance and posture. ‘Play’ is important for the development of children, and also for the health of adults and the elderly. **GBK**

DR. DOUG FRYDAY is the owner of the Optimize Healing Centre in Port Elgin. He is a licensed Chiropractor with a special interest in stress and posture and its effects on neurology. He can be reached at 519-832-1515, by email at drfriday@icloud.com, or visit www.optimizehealing.com to receive your free Digital Dementia Prevention Guide.



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