Technology overuse on child sensory development

The role of occupational therapy in the future field of balanced technology management, improving child health and enhancing academic performance

Reminiscing about growing up in the “good old days,” is a memory trip well worth taking when trying to understand the issues facing the children of today. A mere 20 years ago, children used to play outside all day, riding bikes, playing imaginary games and building forts. Masters of creativity, children of the past manufactured their own form of play that didn’t require costly equipment or parental supervision. Historically, children moved, touched and connected with other human beings a lot, and their visual and auditory world was largely nature based and simple. Prior to the explosion of technology, a child’s sensory stimulation was balanced, allowing for adequate development and integration of the senses. As sensory integration is prerequisite to achieving foundation skills for school readiness, adequate sensory development plays a salient role in a child’s ability to pay attention, print and read (1,2). The rapid intrusion of 21st century

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“Baby TV” now occupies 2.2 hours per day for the 0-2 year old population, and 4.5 hours per day for 3-5 year olds. This situation has prompted France to ban its broadcasters from airing television shows aimed at children under three years of age.
Overuse of technology is fracturing the very foundation of families and education systems as we know them, and causing a disintegration of core values that long ago were the glue that held families and schools together.

processing disorder, anxiety, depression, and sleep disorder can be causally linked to technology overuse, and are increasing at an alarming rate (22-26). Infants with low tone, and toddlers failing to reach motor milestones, are frequent visitors to today’s pediatric physiotherapy and occupational therapy clinics (27). Hard wired for high speed, the young children of today are entering school struggling with self regulation and attainment of attention skills necessary for learning, eventually becoming significant behavior management problems for teachers in the classroom. Poor motor coordination of the hands and eyes is affecting children’s behavior management problems for teachers in the classroom. Poor motor coordination of the hands and eyes is affecting children’s ability to print and read (28), and for the first time in Canadian history, has resulted in a decline in literacy (29). With research now showing access to “green space” reduces attention deficit/hyperactivity disorder (30), and classroom movement improves learning ability (31), an urgent closer look by occupational therapists at the critical sensory and motor requirements for meeting developmental milestones is imperative. Application of research knowledge by occupational therapists regarding the impact of technology overuse on sensory and motor development, would assist in helping parents, teachers and health professionals to better understand the complexities of this issue, and help create effective strategies to manage balanced technology use.

Three critical factors for achieving sensory and motor development milestones

■ Movement
■ Touch
■ Human connection

The three critical factors for achieving healthy physical, psychological, social and behavioral child development are movement, touch and connection to other humans (32-34). Movement, touch and human connection are forms of essential sensory input, integral for the eventual development of a child’s motor and attachment systems. When sensations of movement, touch and connection are deprived, devastating consequences occur. Young children require 3-4 hours per day of physically active, unstructured, rough and tumble play to achieve adequate sensory stimulation to their vestibular, proprioceptive and tactile systems for normal development (35,36). These types of sensory inputs ensure normal development of posture, bilateral coordination, praxis, optimal arousal states and self regulation necessary for achieving foundation skills for eventual school entry.

Many of today’s parents perceive outdoor play is ‘unsafe’, further limiting essential developmental components usually attained in outdoor rough and tumble play (37). Dr. Ashley Montagu, who has extensively studied the developing tactile sensory system, reports that when infants are deprived of human connection and touch, they fail to thrive and many eventually die (38). Dr. Montagu states that touch deprived infants develop into toddlers who exhibit excessive agitation and anxiety, and may become depressed by early childhood. Although Dr. Montagu reports that the critical period for attachment formation is zero to seven months, connection to the human element is biological need that is present for a whole lifetime. Sustenance of body, mind and spirit is achieved largely through human connection, without which, human physical, psychological and behavior states become grossly impaired.

Connection to technology is causing disconnection from self, others, nature and spirit

Technology overuse has had a devastating impact not only on children’s sensory and motor development, but also on the development of a child’s self identity, relationship to others, experience of nature, and sense of spirit. As children are connecting more and more to technology, society has witnessed a pervasive disconnect from self, others, nature and spirit. Self development and identity formation follows the occupational therapy premise that “you are what you do”. If all a child “does” is watch television and play video games, then this experience is truly what they become. Little children often are incapable of discerning their sense of self from the “killing machine” seen on violent television, video games and internet. Shy, lonely and in need of a friend, escaping to the virtual world of technology is causing an irreversible worldwide epidemic of psychological disorders in children. Technology is also rapidly destroying what humans crave and love the most...connection with other human beings. Attachment or connection is the formation of a primary bond between the developing infant and parent, and is integral to that developing child’s sense of security and safety. Establishing the infant-parent bond is best facilitated by close contact with the primary parent, lots of eye contact, and “I see you” communication. Family overuse of technology is gravely affecting not only early attachment formation, but also impacting negatively on child psychological and behavioral health. It appears that today’s families have been pulled into the “virtual dream”, where everyone believes that life is something that requires an escape, and technology becomes the “haven”. The immediate gratification received from ongoing use of television, videogame and internet technology, appears to have actually replaced the

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Sensory and Motor System Imbalance

Further analysis of the impact of technology overuse on the developing child indicates that while the vestibular, proprioceptive, tactile and attachment systems are under stimulated, the visual and auditory sensory systems are in “overload”. This sensory imbalance creates huge problems in overall neurological development, as the brain’s anatomy, chemistry and pathways become permanently altered and impaired (39). Young children who are exposed to violence through television and videogames are in a high state of adrenalin and stress, as the body does not know that what they are watching is not real (40). Children who overuse technology have been reported to experience persistent body sensations of overall “shaking”, increased breathing and heart rate, and a general state of “unease”. Occupational therapist’s might describe this state as a persistent hyper-vigilant sensory system, still “on alert” for the oncoming assault from video game characters. The effect of chronic states of high levels of cortisol (a stress hormone) emitted during video game playing on young children’s sensory development is largely unknown.

In the United States, the American Academies of Pediatrics, Physicians, Psychologists and Psychiatrists have joined with the American Medical Association in classifying media violence as a public health risk (second only to the impact of cigarette smoking on lung cancer), due to the causal correlation with increased child aggression (41). One can’t help but wonder if these children who are overexposed to violent media content will go onto develop a form of Post Traumatic Stress Disorder, as a child’s body experience may be registering viewed media violence as “reality”. While cyberbullying (a new threat to children who use the internet) happens primarily at home, children often act out subsequent aggression in school, creating an escalating and very worrisome situation for school administrations (42). In his book iBrain, Dr. Small a neurophysiologist reports that technology’s rapid intensity, frequency and duration of visual and auditory stimulation, has been found to result in a “hard wiring” of the child’s sensory system for high speed, with subsequent devastating effects on a child’s ability to imagine, attend and focus on academic tasks. An example of the detrimental impact of technology on child academic performance could be found in Dr. Dimitri Christakis’ research which reports that each hour of television watched daily between the ages of zero and seven years of age, equated to a 10% increase in attention problems by age seven years (43). Another consideration for occupational therapists would be the impact of prolonged visual fixation on a fixed distance, two dimensional screen on oculomotor

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on children. Through fostering a sense of self, facilitating healthy relationship formation, using the art of play in an outdoor setting, and bringing forth a child’s inner drive, occupational therapists can reverse this trend to overuse technology. Facilitating vestibular, proprioceptive, and tactile sensory stimulation, and limiting visual and auditory sensory overload, the occupational therapist can help families and schools manage a balanced lifestyle. Understanding and promoting healthy attachment between parent and child is already a part of every occupational therapy session. Through building skill and self-confidence to promote occupational performance, occupational therapists can help children “unplug” themselves from technology, easing the job of parenting and teaching. Using sensory and motor developmental practice frames of reference, and expert design and implementation of effective interventions, occupational therapists can help parents and teachers understand the profound effects of technology overuse on child development and academic performance. Whether working in school or home settings, the occupational therapist is a future leader in the field of Balanced Technology Management, ensuring every child gets what they need to grow and succeed.

Conclusion

While technology is an evolving “train” that will continually move forward, the occupational therapist has expert knowledge regarding its detrimental effects. Immediate action taken toward balancing the use of technology with movement, touch and human connection, will work toward sustaining children, families and educational environments. While no one can argue the benefits of advanced technology in today’s world, connection to these devices has resulted in a disconnection from what society should value most, child health and academic excellence. Occupational therapists have the unique qualifications and skills to assess and treat children who overuse technology, to ultimately help bring the technology train back onto a healthy track. Occupational therapists can help create a sustainable future for every child.

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For a list of references and a full biography of Cris, please visit www.zonein.ca.