

Baltimore County School Health Council
Health Guidance for the Digital Classroom Workgroup

Health Concerns Summary

Health Concern – Research Findings	Key Points
<p>Musculoskeletal</p> <ul style="list-style-type: none"> • Tablet demands are similar to paper tasks • Desktops – better posture but concern is staying in same position for prolonged time • Ergonomics of seating – important thing is adjustability • Gender differences – males tend to have poorer posture; females complain of more musculoskeletal pain • Not a lot of research found related to visual or gross motor skills • Observational studies with younger children only • Keyboarding helps with higher level cognition – one study • Longer duration of use associated with more discomfort • Use of accessories can improve posture and comfort 	<ul style="list-style-type: none"> • Opportunity for changing positions • Intersperse computer use with other activities • Regularly limit time
<p>Vision</p> <ul style="list-style-type: none"> • Increase in prevalence of myopia – believed to be associated with decrease in outdoor activity. Evidence suggests 40-60 minutes of outdoor activity daily is statistically associated with decreased risk • Vision develops throughout childhood • Computer vision syndrome – probably exists with people with pre-existing diagnoses (e.g., adults with dry eye, people with muscle imbalance) computer use exacerbates these conditions • Blue light – no evidence of blue light risk – glasses to block blue light – no change in sleep cycles if persons wore “blue light blocking” glasses. Sleep disruption is probably not eye damage 	<ul style="list-style-type: none"> • Importance of outdoor recess • Filters/apps to decrease glare in those bothered by it

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<p>but related to cognitive/socio/emotional stimulation</p> <ul style="list-style-type: none"> Disability glare – very subjective – probably some individual issues related to glare; 	
<p>Sleep</p> <ul style="list-style-type: none"> Most literature looked at evening use and the number of devices 	<ul style="list-style-type: none"> AAP guideline to come out – will likely stress no electronics one hour before bedtime; no maximum time; can't infer that AAP supports unlimited use; continue to recommend no devices in bedroom, media-free time, go outside and play
<p>Screen Time</p>	<ul style="list-style-type: none"> Play is a way to learn – child-directed play is essential, not adult/computer-led activities School should model for families appropriate use
<p>Special Populations</p> <ul style="list-style-type: none"> Research in this area generally small sample size and can't generalize. Two themes: (1) Theory of ADHD – children become bored more easily; visual stimulation/movement appeals to them – computer results in increased attention. May make a difference in learning but evidence on impact in other areas raises questions (2) students with ADHD more vulnerable to excessive use resulting in decrease in sleep time and physical activity Stronger evidence that increased screen time before age 2 may increase risk for ADHD by training brain what to focus on Some students, particularly students with autism and ADHD, have been reported to have preference for computer tasks. Need plans to ensure balance for these populations. 	<ul style="list-style-type: none"> No evidence to support increasing use of computers for students with ADHD Eliminate computer/screen use for infants up to age 2 School plans for students with special needs should include strategies to promote healthy transitions between preferred and other activities.

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<p>Brain Development</p> <ul style="list-style-type: none">• High use associated with decrease in gray matter, decreased myelination in certain areas (studies of folks with overuse) – however, can't show causality• Some evidence when people do a lot of internet gaming – brain structure changes in the same brain areas as other addictions• Randomized trial of typically developing children showed that one hour of computer games after dinner was associated with decreased sleep efficiency but no change in REM sleep; also decrease in verbal memory performance. Note though, no research on more educational games• Randomized controlled trials – increase in dopamine release with video games• Online gaming – cumulative brain effect on cortical thickness – decreased performance on Stroop test.• Christakis – U of Washington – in ½ hour before cognitive test – decreased performance if do gaming in that window• Reading comprehension – comprehension is worse when reading screen, larger difference is seen with complex texts. Older students showed less difference because of skills with slowing down and re-reading. Younger students might not recognize.• Reading comprehension – think more concretely when read online; less abstraction, lower ability to problem solve• Handwriting – randomized control trial – strong evidence for better learning for notes written by hand – different theories about why – theorize	<ul style="list-style-type: none">• Cooperative games provide significant developmental benefits – more than bells/whistle reward• Reward structures in classrooms should include intrinsic motivators as well as extrinsic motivators like earning computer game time or rewarding high computer use• Important to have option for paper version of texts and homework• Balance!
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<p>that there is something about the cognitive selection of what to write – transcribing (type) versus processing (writing)</p>	
<p>Social/Emotional Development</p> <ul style="list-style-type: none">• Positive connections with key adults are required for social/emotional development• Teachers’ relationships with students are critical opportunities for development of positive connections with adults• Anxiety scores higher for children with higher use of internet – again, causality not clear• School provides important opportunities for children to develop and refine social skills	<ul style="list-style-type: none">• Teachers must continue to develop relationships with students individually• Students should have regular, daily opportunities for non-digital interaction in structured (classroom) and unstructured (recess) settings