



Healthy Schools Network, Inc.

LEARNING WITHOUT PAIN

ERGONOMICS PREVENTS INJURIES

WHAT IS ERGONOMICS ?

“Ergonomics” is a body of knowledge about human abilities and limitations and how these abilities and limitations should be applied to the design of equipment, machinery, and other devices to ensure safe, comfortable and effective use.

PROBLEMS

Backpacks



Computers



*Most homes and schools today are equipped with computers for student use. Backpacks have become the most popular means by which students carry books and other articles to and from school. **If used improperly, both computers and backpacks can cause unnecessary body strain.** Children are especially at risk. This fact sheet provides basic information to parents and school staff on using ergonomic practices to prevent computer and backpack-related stresses or injuries.*

COMPUTERS

Computers are one example of human use of machines. Injuries related to computer use are common. Studies of adults in workplaces have found that inadequately placed computer workstations can result in a wide range of injuries. Students using computer at school -- children's workplaces-- are subject to the same injuries as adults. In a recent study, Cornell University researchers observed 95 elementary school children from 11 schools as they worked at computer in classrooms and computer labs. They found “striking mis-fits” between the children and the computer workstations. In every computer workstation, the monitor and keyboard were placed inappropriately high, forcing students to strain their necks, hands, wrists, arms, back and shoulders. This improper placement of the computer monitor and keyboard puts children at risk for developing painful cumulative trauma disorders (CDT's) or repetitive stress injuries (RSI's). Eyestrain,

blurred vision, and headaches can result from sitting too close to the monitor and glare from the computer screen. As computer use in schools and homes increase, children's health problems will also increase, especially as they get older. Poor work habits coupled with ill-fitting computer workstations can have harmful physical effects that can last a lifetime.

TIPS FOR PARENTS AND TEACHERS ON ERGONOMICALLY CORRECT COMPUTER USE

Teaching ergonomics to children at a young age is critically important. They will develop healthier, safer lifelong work habits.

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- Limit the amount of time children work at the computer, making sure they take periodic breaks during computing time.
- Make sure that the chair at the workstation fits the child correctly. The chair should provide proper lower back support, (a rolled up towel or small pillow can serve as an appropriate lower back support). Use *adjustable* computer workstations that can be modified to accommodate children of different sizes.
- Children's wrists should be level with their forearms while typing-not angled up or down. Their upper arms should be close to the body and relaxed and their elbows should be placed at angle greater than 90 degrees. The mouse should be at the same height as the keyboard. While they are working at the computer, the child's head should be balanced on neck, not craning forward.
- Children's knees should be positioned at approximately 90 - to 120 - degree angle. Their feet should rest on the floor, or on a footrest, box, stool or similar object.
- Reduce eyestrain by making sure that monitors are positioned to minimize glare on the screen, or install a glare screen that fits over the monitor. The monitor should also be positioned so that it is at or below the child's eye level. The screen should be directly in front of the child, at least 18-30 inches away.
- Make sure that children drink enough water throughout the day since children's muscles need adequate hydration to work properly and avoid injury.
- Urge your child's school or PTA officers to provide education on ergonomically correct computer use, and to install ergonomically correct workstations.

BACKPACKS

Backpacks can cause strain if they are overly heavy or worn improperly. Many students are carrying backpacks that are so heavy they are causing back and arm pain. A 1997 Finnish study of some 1,000 children indicated that 1% of 7 year old have back problems and by the age of 10 years, 6% are hurting. Another study of 11 - 12 years olds by the London-Based National Backpack Association found that 80% were wearing backpacks improperly and that some were carrying as much as 60% of their own body weight.

TOPS FOR ERGONOMICALLY CORRECT BACKPACK USE

- A child should never carry a backpack weighing more than 15% of his or her own body weight.
- Make sure that the pack has wide, padded straps and a waist belt that will take pressure off the neck and back.
- Both shoulder straps should work to evenly distribute the weight. Using a pack with several compartments can make this possible. However, several compartments may encourage the user to store too many items

- Heavier objects should be placed closer to the back.
- The backpack should have good padding on the areas that rest against the back.
- The backpack should be positioned so that it does not fall below the hips. It should hang just below the shoulder and rest of the hips.
- Make sure books and other heavy objects are not carried all at once. Only necessary items should be carried; if possible, keep copies of books at home and school.
- Look into new innovations: saddlebags; backpacks with curved or molded back and bottoms; interior ack frames; and backpacks with handles and wheels.
- Parents should talk with the school about the dangers of carrying heavy backpacks and encourage them to cooperate with efforts to decrease the load in children's backpacks.

Call the **Healthy Schools Network, Inc.** for help or guidance on safer use of computer and backpacks.

For More Information: Articles and Websites

* CUergo, Cornell University Ergonomics web:
www.ergo.human.cornell.edu contains information and ergonomic tips on safe use of both computers and backpacks.

*CergoS, The Computer Ergonomics for Elementary School Students web site: <http://www.open.k12.or.us/cergos/>

*Rasicot, Julie, Ergonomics 101, Electronic School, January 2000. <http://www.electronic-school.com/2000-01-0100fs.html>

*Guyer, Ruth, PhD., Backpack=Back Pain, American Journal of Public Health, Vol. 91, No. 1, January, 2001.

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