

OPTIMAL HEALTH UNIVERSITY™

Presented by Katie Gravesen, DC

The Latest Research on Backpack Safety

It's back-to-school time — time for new clothes, new pencils, new notebooks and new backpacks. But, although backpacks are now ubiquitous in schoolyards everywhere, they can also pose a serious health threat. Dr. Gravesen wants to ensure that patients know the best backpack products, weight guidelines and safety habits for a healthy and pain-free school year.

Backpack safety is especially vital because research shows that “children who experience back pain are at a heightened risk of having back pain as adults. The economic impact may be significant, because back pain is a major cause of disability in adults.” (Clin Orthop Relat Res 2003;409:78-84.)



Choosing a Backpack

Selecting a backpack for your child is a bigger decision than you might think. Picking the right pack could prevent a lot of pain down the road. Read on for a few tips.

A Perfect Fit

When purchasing a backpack for your child, take care that the size of the pack is in relation to the child's frame. Also, choose a pack with padded shoulder straps — blood circulation in the neck and shoulders is essential for spinal health. Waist belts that strap around the hips also provide extra support and distribute the load to the pelvis and hips, which are stronger than the midback.

Alternative Backpacks

There are a plethora of innovative

backpack designs that may help you when it comes to deciding the best way to carry your load.

Various alternatives are currently on the market, including “wheelie” packs that are either pushed or pulled. Depending on the ergonomics of these packs, they may or may not be a safer alternative than a standard backpack. It's also important to teach students the proper procedure for pulling or pushing wheelie packs.

Ask the doctor to recommend a spine-friendly pack for your youngster — and for a lesson on how to use it.

Packing and Carrying a Backpack

How you pack and carry the backpack is also vital. The following guidelines should get you started in the right direction.

Carry the Backpack Low

The old school of thought, that backpacks should be carried high on the back, is now refuted by current research.

In one study, researchers observed the alignment of the volunteers' spines while they carried backpacks in various positions. They found that the greatest forward displacement oc-



curred when the pack was carried high around the thoracic region (midback).

Dr. Gravesen explains to patients that it is now suggested that backpacks be centered at the waist or hip level, to allow the pelvis to carry the load, rather than the neck and shoulders.

Lighten the Load

Dr. Gravesen emphasizes that backpacks be limited to no more than 10 percent of the carrier's body weight.

However, even lighter packs may wreak havoc on the spine if improperly positioned. Scientists found that backpacks containing a mere 3 percent of body weight caused the same level of unsafe displacement as much heavier packs when positioned between the shoulder blades. So lengthen those straps! (*BMC Musculoskeletal Disord* 2002;3:10).



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Limit Backpack Time

Researchers hypothesize that the length of time a backpack is carried on a young person's back may be a more significant factor than any other, including weight and placement (*J Pediatr Orthop* 2004;24:211-7).

In one study conducted in California, researchers examined 3,498 students' standing postures with and without backpack loads along with weight, socioeconomic status, age and distance walked to school. Not surprisingly, students who walked to and from school complained more about back pain than those who did not (*Clin Orthop Relat Res* 2003;409:78).

Encourage youngsters only to carry packs when necessary, and to leave books and other items in their locker or at home during times they are not needed.

Use Both Shoulder Straps and Hip Belts

No matter how ergonomically friendly a backpack, it can still do harm when carried improperly. For instance, insist that your children use *both* shoulder straps, as well as hip or stomach straps.

One study looked at 11 male college-aged volunteers and discovered that backpacks "exert consistent anterior force on the lower back, which likely contributes to the occurrence of low-back pain associated with load carriage. Approximately 30% of the vertical force generated by the backpack can be transferred to the lower back by using an external frame backpack with a hip belt." (*Med Sci Sports Exerc* 2004;36:460-7.)

Practice Packing

Always load the heaviest items closest to the back, nearest the center of gravity. Also distribute loads evenly on either side of the back. Practice loading and proper packing with your youngster.

Backpack Safety Beyond Grade School

Young children aren't the only ones sporting backpacks these days. And

backpacks can damage older spines as well. People of all ages need to be aware of backpack safety issues.

Older Students at Risk, Too

Students aged 12 to 18 years are undergoing rapid physical changes and musculoskeletal development. And researchers warn that this age group is not properly educated about backpack safety. In addition, research about backpack safety is lacking in this population.

Even college-age students are at risk of backpack-related injury. One analysis examined the influence of backpack use on pelvic tilt and rotation in college-age females. Pelvic motion was "significantly decreased" when walking with a backpack. The study concluded that this practice causes "permanent posture deviations in young female college students." (*Gait and Posture* 2006;23:263-7.)

Not Just for Students

Backpacks aren't just for students: Adults use backpacks for carrying a variety of loads, from books to babies. A brief report on child carriers and backpacks concluded that injuries from child carriers and backpacks "appear to come from three general sources: product appropriateness and design, product condition, and product use." (*Injury Prevention* 2000;6:56.)

Additional Ways to Prevent Backpack-Related Pain

Add to your arsenal of weapons against backpack-related pain with these additional strategies.

Exercise

Research reveals that children who exercise through school physical education programs or on their own are less likely to have back pain (*Eura Medicophys* 2004;40:55-6).

In-school physical education programs, as well as after-school sports and individual activities, all prevent backpack-related pain. So enroll your youngster in a regular exercise program, if he or she is not already involved in one.

Chiropractic

Students' spines are assaulted with an array of stresses, including backpack loads, long hours spent studying, sports and the emotional toll of childhood and adolescence.

Regular chiropractic care is crucial to a growing spine. Chiropractic addresses areas in the spine where movement is restricted or spinal bones (vertebrae) are slightly out of alignment. This condition, known as **vertebral subluxation**, is widespread among students of all ages. Vertebral subluxations are linked with a collection of problems, which can impede academic performance and overall well-being.

Regular chiropractic care keeps spines free of vertebral subluxations, allowing patients to function at optimal capacity. As part of your back-to-school preparations, make sure to schedule your children for a chiropractic check up!



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