

# Backpack Safety



**Wrong**  
Strap on only one shoulder



**Correct**  
Wide, padded straps on both shoulders



**Wrong**  
Load too heavy



**Correct**  
Load no more than 10-15% of body weight

## Buy the right backpack:

### A padded back

to reduce pressure on the back, shoulders, and underarm regions, and enhance comfort;

### Hip and chest belts

to transfer some of the backpack weight from the back and shoulders to the hips and torso;

### Multiple compartments

to better distribute the weight in the backpack, keep items secure, and ease access to contents;

### Reflective material

to enhance visibility of the child to drivers at night.

## Wear it correctly:

### Wear both straps

By wearing two shoulder straps, the weight of the backpack is better distributed, and a well-aligned symmetrical posture is promoted.

### Position backpack carefully

The backpack should be positioned in the middle of the back. Shoulder straps should be adjusted to allow the child to put on and take off the backpack without difficulty.

### Lighten the load

Keep the load at 10-15% or less of the student's body weight.



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# BACKPACKS

## *Physical Therapists Offer Tips to Lighten the Load on Children's Backs*

While backpacks are a convenient way to carry books and school supplies, an overloaded and/or improperly worn backpack gets a failing grade. Physical therapists can assist students in making changes while carrying school items.

### **Students wearing backpacks improperly or ones that are too heavy are at an increased risk for spinal injury\***

Postural changes, particularly excessive forward head posture, are magnified when the backpack weighs more than 15% of the student's body weight. The postural imbalances appear to be most significant with prepubescent female students.

**Injury can occur when a child, in trying to adapt to a heavy load, uses faulty postures such as arching the back, bending forward, or leaning to one side.** These postural adaptations can cause improper spinal alignment, which hampers functioning of the disks that provide shock absorption. A backpack load that is too heavy also causes muscles and soft tissues to work harder, leading to strain and fatigue. This leaves the neck, shoulders, and back more vulnerable to injury.

## **Tips for safe backpack use:**

- ▶ Wear both straps. Use of one strap causes one side of the body to bear the weight of the backpack. This can be true even with one-strap backpacks that cross the body. By wearing two shoulder straps, the weight of the backpack is better distributed, and a well-aligned symmetrical posture is promoted.
- ▶ Remove and put on backpacks carefully. Keep the trunk of your body stable and avoid excessive twisting.
- ▶ Wear the backpack over the strongest mid-back muscles. Pay close attention to the way the backpack is positioned on the back. It should rest evenly in the middle of the back. Shoulder straps should be adjusted to allow the child to put on and take off the backpack without difficulty and permit free movement of the arms. Straps should not be too loose, and the backpack should not extend below the low back.
- ▶ Lighten the load. Keep the load at 10-15% or less of the student's body weight. Carry only those items that are required for the day. Each night remove articles that can be left at home. Organize the contents of the backpack by placing the heaviest items closest to the back to reduce forces that cause postural malalignment and overwork muscles. Use CD's instead of full textbooks whenever possible; some students even have two sets of books so as not to have to carry the heavy books to and from school.

## **Design features to consider when selecting a backpack:**

- ▶ A padded back to reduce pressure on the back, shoulders, and underarm regions, and enhance comfort;
- ▶ Hip and chest belts to transfer some of the backpack weight from the back and shoulders to the hips and torso;
- ▶ Multiple compartments to better distribute the weight in the backpack, keep items secure, and ease access to contents;
- ▶ Reflective material to enhance visibility of the child to drivers at night.

Backpacks with wheels are a good option for younger students who do not change classes or go up and down stairs frequently, but there are precautions to use with those as well. Be sure that the extended handle is long enough so that the child is not forced to twist and bend, and that the wheels are sufficiently large so that the backpack doesn't shake or topple.

## **Warning signs that the backpack is too heavy:**

- ▶ Change in posture when wearing the backpack;
- ▶ Struggling when putting on or taking off the backpack;
- ▶ Pain when wearing the backpack;
- ▶ Tingling or numbness in arms and legs, mostly arms; or
- ▶ Red marks on the shoulders.



*\*This theory was confirmed in a study conducted by Mary Ann Wilmarth, PT, DPT, MS, OCS, director of the transitional doctor of physical therapy degree at Northeastern University in Boston. Wilmarth conducted the study at a private, pre-kindergarten through 9th grade school in Andover, Massachusetts.*