

Backpacks and Back Pain

A backpack is probably the most important school supply you can buy for your child. Your children will transport schoolwork, homework, snacks, lunch, and toys that are important to them in their backpacks, often overstuffing them. If the backpack gets left at school or home, they cannot complete their work assignments. Many of these items need to be carried on a daily basis and cause a heavy load for the child.

Backpacks are made differently now than they used to be. Manufacturers account for the weight that is put in backpacks and placed on children's backs and try to pad and construct the backpacks to disburse the weight throughout the bag. Many research studies have been done over the years correlating poor posture, back painⁱ, and scoliosis to the weight children carry on their backs during the school year.

Studies have shown that both the weight of the load on the child's back and duration the child carries the load impact the stress and strain on the child. This load may cause changes in lumbar disc height or curvature of the spine.ⁱⁱ According to one study, disbursing the load symmetrically utilizing two straps of a backpack rather than asymmetrically with one shoulder strap, helped limit the postural changes that arise from carrying such a heavy load.ⁱⁱⁱ

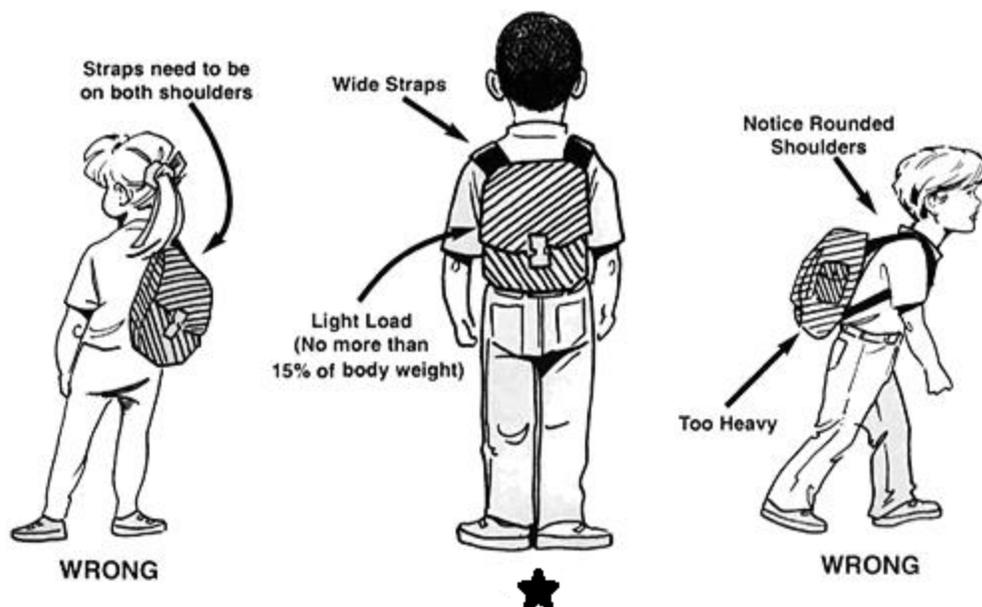
There are laws that protect workers against carrying heavy loads but there are no laws that protect children against carrying heavy loads, specifically in their backpacks. The literature supports a correlation between back pain in children with back pain in adulthood.

A well-padded backpack that has more than one pocket to disburse the load, is worn symmetrically over both shoulders at waist height, and does not exceed 10% of the child's body weight will help protect children's backs from pain and help prevent impaired posture in adolescents.

Please keep these guidelines in mind when buying and packing your child's school bag. If you should have any questions or concerns regarding your child's posture or back pain, please call or email The Therapy Gym.

Backpack guidelines:

- Many studies state children should carry no more than 10% of their body weight on their backs but the American Academy of Orthopaedic Surgeons recommends no more than 15%-20% of their body weight.^{iv}
- The weight should be disbursed throughout the bag in different pockets so it is not loaded in one area.
- Typical school backpacks should be positioned with the center of the bag at waist or hip level.^v
- Children should use both shoulder straps, rather than just one strap.
- Weigh your child's backpack on your scale to make sure it does not exceed the weight limit suggested.
- Your child can carry a book or two in his/her hands so he/she does not overload his/her backpack.



Elisheva Fuchs has a doctorate in physical therapy and is the owner of The Therapy Gym in Teaneck. She can be reached at 201-357-0417 or ellie@thetherapygym.com. For more information on The Therapy Gym, please visit www.thetherapygym.com.

ⁱ [Negrini S, Carabalona R. Backpacks on! Schoolchildren's perceptions of load, associations with back pain and factors determining the load. *Spine \(Phila Pa 1976\)*. 2002 Jan 15;27\(2\):187-95.](#)

ⁱⁱ [Neuschwander TB, Cutrone J, Macias BR, Cutrone S, Murthy G, Chambers H, Hargens AR. The effect of backpacks on the lumbar spine in children: a standing magnetic resonance imaging study. *Spine \(Phila Pa 1976\)*. 2010 Jan 1;35\(1\):83-8. doi: 10.1097/BRS.0b013e3181b21a5d.](#)

ⁱⁱⁱ [Negrini S, Negrini A. Postural effects of symmetrical and asymmetrical loads on the spines of schoolchildren. *Scoliosis*. 2007 Jul 9;2:8.](#)

^{iv} <http://www.webmd.com/parenting/features/kids-backpacks-101?page=2>

^v [Grimmer K, Dansie B, Milanese S, Pirunsan U, Trott P. Adolescent standing postural response to backpack loads: a randomised controlled experimental study. *BMC Musculoskelet Disord*. 2002 Apr 17;3:10. Epub 2002 Apr 17.](#)