

## "Geez, What Are You Carrying in Here ... Bricks?"

by Kristen Renee Daley

It has become a picture that parents are most proud of: their child heading to the school bus, awaiting the trip to their new classroom. They are well-prepared, with pencils, erasers and notebooks in tow.

Indeed, backpacks can be useful for our little Einsteins. Many of them come with multiple compartments that help kids stay organized by keeping important books and papers in place. Backpacks are better than shoulder bags or purses for carrying such material, since the back and abdominal muscles (the strongest muscles in the body) are used to support the weight of the pack. However, to take full advantage of these benefits without the disadvantage of feeling overburdened or in pain, it is important that children use backpacks properly. This means watching the weight of the pack and carrying it correctly.

According to the American Chiropractic Association, young children are suffering from back pain much earlier than previous generations, and the use of weighty backpacks is a contributing factor. Heavy packs can cause a child to hyperextend, or arch, his or her back, or lean the head and trunk forward to compensate for the weight of the bag. These postures can stress the muscles in the neck and back, increasing the risk of injury and fatigue. The natural curves in the middle and lower back can become distorted, which can cause irritation to the spine joints and the rib cage. A rounding of the shoulders could also result if a back has to compensate for a heavy load.

Wearing a backpack on one shoulder may cause a child to lean to one side in order to compensate for the extra weight. The middle back, ribs and lower back can become stressed on the side of the body opposite of where the backpack is placed. Carrying the pack on one shoulder may also cause upper back pain and a strain in the shoulders and neck.

Heavy backpacks can also increase the risk of falling. Research by the American Academy of Physical Medicine and Rehabilitation found that students carrying backpacks weighing 25 percent of their body weight had balance problems and were unable to perform normal activities such as climbing stairs and opening doors. Conversely, students who wore backpacks weighing 15 percent of their body weight maintained balance moder-

ately. The most effective weight carried in the packs, however, was five percent of body weight.

A recent study of the relation between backpack use and back pain in adolescents showed that the use of backpacks during the school day and backpack weights are independently associated with back pain. The students that participated in the study answered a questionnaire about their health, activities and backpack use, and each child's body weight, height and backpack weight were measured. Of the more than 1,100 backpack users between the ages of 12 and 18 surveyed for the study, nearly 75 percent were classified as having back pain. Children were classified as having back pain if one or more of the following symptoms were reported during the preceding month: neck and back pain which had interfered with school or leisure; neck or back pain with a severity rating of two on a scale of zero to 10; a visit to a doctor or therapist for neck or back pain; or exemption from physical education or sports activities because of neck or back pain. Their condition was validated by significantly poorer general health, more limited physical functioning and more bodily pain.

As compared with low or no use of backpacks, heavy use was independently associated with back pain. Compared to adolescents who had no back pain, those with back pain carried significantly heavier backpacks that represented a significantly greater percentage of their body weights. In addition, female gender and larger body mass were significantly associated with back pain.

### Preventing Posture Problems and Pain

There are methods for preventing posture problems and other conditions associated with toting a heavy backpack. The first is to limit the weight of the backpack. Many physicians feel that backpack loads become a health problem when they reach 20 pounds or more. The American Physical Therapy Association recommends that children carry backpacks of no more than 15 percent of their body weight – less than that is even better. For example, a child weighing 50 pounds should carry no more than 7.5 pounds in their backpack; children weighing 100 pounds should carry no more than 15 pounds on their back; and children and adolescents weighing 150 pounds should



*This backpack is overloaded, creating stress on the spine. Improper backpack use can lead to a lifetime of health problems. Photo courtesy of Backpack Safety.*

not carry more than 22.5 pounds.

Packs that sit on one shoulder, are slung across the chest or have only one strap are not as effective at distributing weight as bags that have two wide shoulder straps. Additionally, narrow straps supporting a heavy backpack can dig into the shoulders and interfere with circulation and the nervous system.

As you prepare your child to head back to school, here are some tips on how to ensure that his backpack is safe, as well as ways to be proactive when it comes to the amount of weight your child carries to and from school everyday.

### Choosing the Right Backpack

There are several characteristics to look for in backpacks that will contribute to your child's comfort each school day. It is important to start with a lightweight backpack that will not add much weight to the load carried inside. The width should not be greater than that of the child's torso. Two wide, padded shoulder straps are important in helping the child carry the pack without pain. Look for shoulder straps that are at least two inches wide. In addition, a waist strap can distribute the weight of a heavy backpack more evenly. A padded back protects against sharp edges on objects inside the pack.

If a child must bring a heavy load to school each day, a rolling backpack can be beneficial. However, you should remember that those packs still must be carried up

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# Backpack Safety

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stairs, and they may be difficult to roll in the snow. Check with your child's school about their policy on rolling backpacks. Some schools may prohibit the use of the packs because they can clutter hallways and result in dangerous trips and falls.

## Proper Loading and Carrying

Once you've finished shopping for school supplies, take the time to sit with your child and organize the supplies in his or her backpack. The heaviest objects should be packed first so that they are carried lower and closer to the body. Backpacks with individualized compartments can help distribute the weight of the load more evenly and keep items from shifting during movement.

Parents and children alike should be sure to watch the weight carried in the pack throughout the school year. If the packed book bag forces your child to move forward in order to carry it, it is overloaded. A backpack should be cleaned out once a week to remove any unnecessary items that are creating more weight for the student to carry. Parents should encourage their children to carry only the books that are necessary and to use their lockers or desks frequently during the day.

How a child wears a backpack is important in determining how his or her body will be affected by the extra weight. Children should always use both shoulder straps and wear the pack on the back. The straps should be adjusted to fit the pack snugly to child's body. Using a waist belt and/or chest straps. Keeping a backpack close to the hips shifts the "work" to the legs. Hold the bottom of your child's backpack two inches above the waist, and keep the top of the pack just below the base of the skull. Encourage your children to lift the pack by using the leg muscles and apply one shoulder strap at a time.

Outside of the home, parents can continue to help prevent any negative effects their children may encounter while carrying a backpack. Talk to your child's teachers about how to minimize the need for transporting heavy books to and from school. This could be done by keeping one set of books in the classroom for daily work while leaving heavier books at home, or by making photocopies of homework chapters and assignments that can be easily carried. If possible, purchase a second set of your child's textbooks to keep at home. Inquire as to whether or not textbooks on CD-ROM can be purchased by the school or by a parent. Don't be concerned that you are the only one worrying about the weight of your child's backpack. California State Assembly



*Wearing a backpack improperly over one shoulder can cause permanent misalignment of the spine, muscle fatigue, and a lowered state of health. Photo courtesy of Backpack Safety.*

recently passed legislation to force school districts to develop ways of reducing the weight of student backpacks, and other states are following suit.

Most importantly, encourage your child to tell you about any pain or discomfort

caused by a heavy backpack. If your child does offer a complaint, reduce the weight of the backpack immediately.

## Caring For Your Child

If you find that your child is struggling to get his backpack on or off, has back pain, has to lean forward to carry his bag, or has numbness or weakness in the arms and legs, it is important to speak with your child's doctor. Your child can benefit from a visit to his or her physician, or to a chiropractor or physical therapist.

Another way to help prevent back injury that could result from carrying a heavy backpack is to exercise, particularly strengthening the stabilizing muscles of the torso, including the lower back and abdominal muscles. Enjoyable activities such as yoga and tai-chi can be effective in strengthening those muscles. ♥

*Information for this article was obtained from: KidsHealth, the Congress of Chiropractic State Associations, the American Academy of Pediatrics, the American Chiropractic Association, spine-health.com, the American Academy of Orthopaedic Surgeons, the International Chiropractic Pediatric Association and Backpack Safety (backpacksafe.com), an on-line resource for students and parents.*