

Adapted from "Heavy Backpacks Harmful to Students, Simmons Study Says," Boston Globe, February 13, 2001, by Scott Greenberger.

Heavy Backpacks Harmful to Students, Simmons Study Says

You see it in every schoolyard in America: the slight hunch forward, the tucking of the hand under the taut strap, the tug and, finally, the struggle to stand up straight.

Students who use backpacks to carry heavy textbooks to and from school execute those moves dozens of times a day. Though most are used to the burden, a new study suggests many are doing themselves harm.

Fifty-five percent of the Massachusetts children surveyed by researchers at Simmons College typically carry loads heavier than 15 percent of their body weight - the limit recommended by the American Academy of Orthopedic Surgeons.

Though the researchers couldn't definitively draw a connection, one-third of the 345 children in grades 5 through 8 surveyed reported back pain that forced them to see a doctor, miss school, or skip athletic activities.

The students, who were recruited through Healthnet, a statewide Internet health education program, weighed themselves and their backpacks under the supervision of teachers.

"If your head is kind of like a turtle in a forward position, that will cause pain and make you more vulnerable to injury," said Shelley Goodgold, associate professor of physical therapy at Simmons. "We know that putting the backpack on will make you more vulnerable."

Though a heavy backpack isn't healthy for anyone, children are particularly susceptible to injury because their bodies are still developing, Goodgold said.

Ninety-four percent of the students in the -study carried standard two-strap backpacks, and most said they used both straps. But only 4 percent used the hip belt recommended by health professionals. Packs designed to give better support, such as those with metal frames, weren't popular among the middle school students.

The Simmons study comes amid growing concern about heavy packs.

In Melrose, school officials sent a letter to parents warning them about heavy backpack burdens. Northeastern University researchers have tapped Beverly High School students for their study on backpack back pain. And the US Consumer Product Safety Commission has reported that in 1999, more than 800 youngsters were treated in emergency rooms for backpack-related injuries.

"They shouldn't make us take all this stuff around," said 11-year-old Sean White, who looked like he might be swallowed up by his black backpack as he stood outside Richard J. Murphy School in Dorchester. "When I go to sleep sometimes, my back hurts."

But a heavy backpack isn't all bad, according to White. He said it comes in handy when he has to swing the pack at his 13-year-old sister.

Adapted from "Backpack May Spell Backache," Current Health, September 2000, by Tamra Orr.

Backpack May Spell Backache

It hangs around with you almost every day. It manages to handle whatever you throw into it. It's cool. It's convenient. It's your backpack!

But guess what? The facts are in: Backpacks can be dangerous! Yep, that handy backpack just might be your own personal ticket to lots of back problems in the future.

"We are seeing students in the fourth and fifth grades who are complaining about backaches, fatigue, and (physical) stress," says Russell Windsor, M.D., a surgeon at New York City's Hospital for Special Surgery. Dr. Windsor is an expert in orthopedics (or-tho-PEED-ix; having to do with the prevention or correction of skeletal deformities).

What causes the complaints Dr. Windsor hears from kids? Backpacks that don't fit properly, backpacks that weigh far too much for kids to be carrying safely, and backpacks that are worn with the weight unevenly distributed.

How much are kids carrying on their backs? Many of them are carrying more than 25 percent of their overall body weight, and that is just too much. Experts like Dr. Seymour Zimble - Associate in Orthopedic Surgery at the Children's Hospital in Boston, Massachusetts - recommend that you carry no more than 15 percent of your total body weight, and preferably less than that. What does all that mean? If you weigh 80 pounds, your backpack should not weigh more than 12 pounds. If you weigh 100 pounds, your backpack should tip the scales at less than 15 pounds. Any more than this will cause a lot of wear and tear on the muscles, joints, and ligaments of your shoulders, neck, and spine. That can mean pain today and real back problems in the future.

"If you have a 90-pound female carrying a 20-pound backpack, then the backpack weight becomes a medical issue," says Dr. Charlotte Alexander, an orthopedic surgeon in Houston. "We found one 10th grade female student with a backpack weighing 47 pounds!"

How much does your backpack weigh? Bring out the bathroom scale and find out. Put all the books you usually carry in it and then put it on the scale. Is it less than 15 percent of your weight? If you're like most kids, the answer is no.

Adapted from "Overstuffed Backpacks Are Giving Children Adult-Like Back Pain," The Wall Street Journal, April 6, 2002, by Tara Parker-Pope.

Overstuffed Backpacks Are Giving Children Adult-Like Back Pain

THE MEDICAL COMMUNITY is weighing in on the debate about the amount of homework students are asked to do. The diagnosis: The problem isn't how much homework kids have, but how much they are carrying.

Doctors say they are seeing a growing number of children suffering serious back pain as the result of carrying around overloaded backpacks. Because children's spines are still growing, many fear the heavy packs and tilted gait they cause could lead to long-term back problems.

Injuries associated with backpacks have more than doubled during the past five years. More than 6,000 children are treated in hospital emergency rooms each year for injuries related to lugging heavy backpacks-and most are under 14 years of age.

The phenomenon even prompted the Congress of Chiropractic State Associations to declare April National Backpack Safety month.

A study by Akron General Medical Center weighed the backpacks of more than 400 fourth and fifth graders. The average pack weighed about 14 pounds. More significantly, the fourth graders were carrying about 15% of their body weight, while the fifth graders were carrying, on average, 17%.

MANY KIDS, however, carried far heavier bags. The study found that nearly a quarter of the children carried a backpack weighing more than 20% of their body weight. The equivalent would be a 180-pound man carrying nearly 40 pounds on his back, several times a day, five days a week.

"This is too much weight for kids to be carrying around," says Heidi Frasure, hospital research coordinator and one of the study's authors.

The trend is particularly troubling because children are now complaining of aches and pains that 'historically haven't shown up until people hit their 30s or 40s.

"Unfortunately children are carrying backpacks that are 25, 30 and 40% of their body weight," says New York City chiropractor John Vilkelis. "As the backpack gets heavier, they alter their posture more, they lean forward to support the weight, and it can cause all kinds of different injuries to their back and neck."

Andrew B. Marsh, physical therapist at the University of Michigan spine program, says he has seen kids as young as five or six complaining of back pain.

The problem, he says, is one of repetitive strain. Overloaded backpacks are carried by kids on their way to the bus stop, from the bus to the school, between classes, and on the way home – every day, five days a week.

Adapted from "School Backpacks Can Be Painful Burden," Health Scout News, September 17, 2001, by Nancy A. Melville.

School Backpacks Can Be Painful Burden

Homework can place a heavy burden on kids in more ways than one. Experts warn that the load can be more than just a pain in the neck if proper backpack usage isn't followed. Injuries related to backpacks, in fact, accounted for more than 13,260 visits to hospital emergency rooms, doctors' offices and clinics last year, according to estimates and projections of the U.S. Consumer Product Safety Commission.

Although backpacks are still a highly recommended way of carrying books around, the improper use of them may defeat their purpose, explains Dr. Angela D. Smith, an orthopedic surgeon at Children's Hospital of Philadelphia. The problem is that many children using backpacks these days either don't use backpacks that meet the recommended parameters or don't use them appropriately, Smith says. Among the most important recommended features are that backpacks have padded straps and a waist or hip belt. These devices prevent strain on the shoulders and help stabilize the pack in place. Straps are helpful to cinch in books that would otherwise sag out the back.

But just as important, Smith adds, is how books are placed inside the pack. If books are placed flat, or fall flat, as opposed to being upright, that's when problems with back strain can occur. But with the load positioned lengthwise and extending away from the body, your position must be altered or aches and pains can result, adds Dr. David L. Skaggs, an assistant professor of orthopedic surgery at Children's Hospital, Los Angeles.

"The further backwards you have the weight, the more it pulls you backward, so as a result you have to lean forward," he says. "The important thing is to have the heaviest stuff right against your back to keep the center of gravity above your pelvis," he adds.

Another problematic book-carrying practice is carrying a pack or bag on just one shoulder, says Skaggs. "If books are being carried with only one strap, it's an asymmetrical load that's placed on the back. And we know from long-term studies that asymmetry and leaning to one side is probably linked to back pain." Muscle strain is the main problem, explains Smith. You'll get some pain in your back and the body's response to the pain is to shut off the muscles or make them spasm. Then the muscles weaken because they've been in pain and now they can do even less work, so it becomes a downward spiral. Smith encourages building strength in abdominal and back muscles through exercises like stomach crunches, because simply being physically fit may not help alleviate backpack pain problems. Skaggs adds, however, that the daily chore of carrying the backpack around itself is often enough to build up the proper muscles. "The best exercise is probably just doing it," he says.

Even proper positioning can be undermined if a backpack is simply overloaded, however, the experts say. But proper weight limits can differ with each individual, Smith notes. "I steer away from making any recommendations in terms of how much weight should be carried because what works for one person may be completely different for another," she says. "My recommendations to kids are simply the same things I learned growing up about camping, and it's the same thing the Girl Scouts or Boy Scouts will tell you: Pack everything you need and then take away half of it," she adds.

Adapted from "Backpack as a Daily Load for School Children," The Lancet, December 4, 1999, by Stefano Negrini, Roberta Carabona, and Paolo Sibilla

Backpack as a Daily Load for School Children

34.8% of Italian schoolchildren carry more than 30% of their bodyweight at least once a week, exceeding limits proposed for adults. Given increasing evidence of back pain in children, the time has come to propose some limitations to backpack load.

Repetitive loading of the spine is a risk factor for low back pain not only in adults but also for children. The load that children most commonly carry is their school bag or backpack. Most studies of this issue have been published in non-indexed journals and have various limitations. Nevertheless, some results suggest that the backpack could be a factor contributing to low back pain in schoolchildren with sufferers carrying backpacks for more time and experiencing greater fatigue and difficulty. We aimed to quantify the absolute and bodyweight-related backpack load carried daily by schoolchildren.

We studied children in the school catchment area of Bresso, Milan. We ascertained the weight of the backpacks of all the year 6 children at school (n = 237, average age 11.6 years, 119 girls). The data were collected daily on 6 days at school (from Monday to Saturday) over a period of 3 weeks. The days included were not shown to the children or to teachers. The average load and the maximum load of the backpacks was calculated for each child, for the week, and the average of these measurements calculated for the total population.

Sixty-one girls attended our institute for further assessment after their parents gave informed consent; they were assessed by a single specialist in pediatric orthopedic rehabilitation with medical scales.

The average load carried daily by schoolchildren was 9.3 kg, and the maximum load was 11.5 kg. The average load was 22% of bodyweight and the maximum load was 27.5% of bodyweight; 34.8% of the pupils carried more than 30% of their bodyweight at least once during the week.

The average load and maximum load being carried by children are equivalent to an 80 kg man carrying daily a backpack with an average load of 17.6 kg and a maximum load of 22.0 kg (or for a 60 kg woman, 13.2 kg and a 16.5 kg, respectively). In Italy, labor laws restrict the maximum load that can be lifted during work to 30 kg in men and 20 kg in women. The limits are 20kg and 15 kg for workers aged 15-18 years. The USA recommended limit for adults is 23 kg, which is deemed to protect 99% of men and 75-90% of women. No limits have been developed for application in schools; the limits usually proposed for children, although scientifically unproven, (10-15% of bodyweight) are widely exceeded in everyday life.

Rates of low back pain in children are approaching those seen in adults. Although the economic importance of the problem is small at this age, the lack of certified limits for backpack carrying is shortsighted. Previous studies have shown that the backpack load contributes to low back pain in childhood, and our results suggest that a decrease in this load is advisable.