

Prof demystifies long-term health damage of backpacks

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It's that time of year again. Store shelves are stocked full of back-to-school items and parents are making decisions about what to buy.

At the top of many shopping lists is a new school bag, but parents often struggle over finding the safest option for their child.

"Every September, we start to hear controversy about whether backpacks are to blame for back and neck pain in children," says Brock University Assistant Professor of Kinesiology Michael Holmes. "To put parents' minds at rest, recent literature suggests there is little evidence to support links between backpack use and pain."

As a Canada Research Chair in Neuromuscular Mechanics and Ergonomics, Holmes asserts while several systematic reviews have been done, it has been difficult to link usage of backpacks to poor biomechanics and ultimately back pain or damage.

"My philosophy is that, for the most part, as a parent you don't have to worry too much about it," Holmes says. "If a backpack has a reasonable amount of weight in it and fits correctly, children

are not wearing it long enough for long-term damage to occur."

To assist with the myth busting, Holmes offers a scenario to help put parents' concerns into context.

"For a nurse, who lifts hundreds of patients a day over a long career, there is a cumulative loading effect on the spine that will eventually cause damage to the spine. It's a main reason why back pain in nurses or caregivers is so prevalent," Holmes explains. "By comparison, kids are strong and resilient. In the event that fatigue does occur, they recover fast."

However, when given the choice, Holmes does recommend backpacks over [shoulder](#) bags, messenger bags or purses, as they keep the body balanced.

"Bags worn on one shoulder create an asymmetry of what muscles are being used, which can load the spine in undesirable ways," Holmes explains.

While he wants to alleviate concerns, there are still best practices from an ergonomics stand point which can be beneficial for long-term spinal health.

"There are a lot of good ergonomic principles in modern packs today, so if there is one item to invest in, it's a good backpack," Holmes says. "Simply purchasing a good pack is only half the battle; it needs to be worn properly. We are all guilty of just throwing a bag over one shoulder and going, so even the best-designed pack and interventions are not going to prevent human nature."

Holmes and Associate Professor of Kinesiology Gail Frost have compiled a list of tips and considerations for parents and students.

Good backpacks will have:

- A waist strap to distribute the load more to the hips, as well as keep it closer to the body to improve balance and reduce demands on muscles.
- Wide, padded shoulder straps, which are more comfortable on the shoulders and neck and prevents the weight from being concentrated on one area, which could impair circulation and nerve function.
- A padded back.
- Compartments so weight can be evenly distributed.

Other considerations:

- The pack should be light when it's empty, not loaded down with fancy hardware that adds weight before anything is even put into it.
- It should have a reflective strip so the child can be seen in car headlights.
- For sizing, the pack should be proportional to the size of the person. Smaller children should have smaller packs and [parents](#) should avoid over packing.
- The bottom of the pack should sit at waist level.

Parents should encourage children to:

- Wear the [backpack](#) appropriately, with both shoulder straps on to encourage balance across two strong muscle groups—the back and abdominal muscles.
- Be mindful of what's carried daily. Encourage children to use desks and lockers effectively.
- Be active, movement is good. Regular physical activity helps to prevent injury.

Provided by Brock University

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