

2019

Customer-Centric Design in Wearable Products for Ergonomic Support

Nathan Guillemette
nmguillemette@gmail.com

Creative Commons License

[Creative Commons License](#)

This work is licensed under a [Creative Commons Attribution-Noncommercial-Share Alike 4.0 License](#).

Follow this and additional works at: <https://digitalcommons.uri.edu/srhonorsprog>

Recommended Citation

Guillemette, Nathan, "Customer-Centric Design in Wearable Products for Ergonomic Support" (2019). *Senior Honors Projects*. Paper 705.

<https://digitalcommons.uri.edu/srhonorsprog/705><https://digitalcommons.uri.edu/srhonorsprog/705>

This Article is brought to you for free and open access by the Honors Program at the University of Rhode Island at DigitalCommons@URI. It has been accepted for inclusion in Senior Honors Projects by an authorized administrator of DigitalCommons@URI. For more information, please contact digitalcommons@etal.uri.edu.

The Modern Backpack

The backpack is an essential accessory to any student or traveler's daily carry list. However, the way in which we use our backpack can affect our overall quality of daily life. Used properly, a backpack can allow for someone to carry their daily items. However, when used improperly, a backpack can be harmful to your health.

When using a backpack, remember to:

- Use both straps.
- Keep your bag as light as possible.
- Make sure the straps are adjusted equally.



Statistics Concerning Back Pain

- In a study done of 1540 children ages 11-14 years, 37% of the children reported back pain. Of those 37%, 34% limited their activity due to the pain, 14% use medication for pain relief, and 82% believed their backpack caused or worsened their pain.^[1]
- According to the American Association of Neurological Surgeons, 75-85% of Americans will experience back pain.^[2]
- According to 2012 report about from the Center for Disease Control (CDC), over 20% of American adults suffered from lower back pain, more than 14% suffered from neck pain, and almost 10% struggled with sciatica.^[2]

[1] Skaggs, David L., et al. "Back Pain and Backpacks in School Children." *Journal of Pediatric Orthopaedics*, vol. 26, no. 3, 2006, pp. 358-363., doi:10.1097/01.bpo.0000217723.14631.6e.

[2] Manning-Schaffel, Vivian. "Why Our Bags Are Wrecking Our Backs." *NBCNews.com*, NBCUniversal News Group, 25 Sept. 2017.

Nathan Guillemette

Sponsored by:

SIS Lab
254 Pastore Hall
Kingston, RI 02881

URI Honors Program

Contact:
E-mail: nguillemette@my.uri.edu



An Everyday Object

A good backpack is a part of almost everyone's daily list of things to bring with them. However, many of these people could tell you the amount of back pain they experience on a day-to-day basis. Worn incorrectly, a backpack can affect the quality of your spinal health.

This pamphlet is not a cure-all for back pain. But, in following some of the steps discussed and practicing some of the proper ways to use a backpack, you can help reduce some of your own back pain.

How Weight Affects Your Back

Weight placed on the back causes the vertebrae to compress and the curvature of the spine to increase. Over time, this can lead to back pain as a result of pinched nerves or compressed disks. If the straps are not equally adjusted, or the weight in the bag is not distributed evenly, this puts more weight on one side of the body than the other. As a result, this can create a curve to the left or right over time.



By habitually overloading a bag, one can expect rounded shoulders, lower back or neck pain, and strained muscles. In order to reduce the risk of these effects occurring, there are several steps you can take.

What to Avoid, and Proper Use

What to avoid:

- Don't wear your backpack on one shoulder.
- Don't overload your backpack.

Tips for proper use:

- Adjust the straps until the bag sits evenly across your shoulders.
- Remove heavy objects you may not need. Your back should not be more than 10% of your body weight.

Pro tip:

If your backpack is equipped with a hip strap, use it whenever you feel discomfort. If you think your bag may be heavy, using a hip strap can reduce the pressure on your shoulders by up to 30%!^[1]

Remember to wear both straps!



Credit: wsj.com