

Abdominal Binders

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Abdominal binders are simple pieces of equipment that are used to support the abdomen. This page outlines what abdominal binders are and how they are used after spinal cord injury (SCI).

Key Points

- Abdominal binders are devices which apply pressure to the abdomen to help improve breathing and circulation in upright postures.
- These may be elastic or non-elastic devices that wrap around the lower torso to apply pressure and mimic the function of the abdominal muscles.
- Abdominal binders are considered safe with a minimal number of risks when used appropriately.
- Research suggests that abdominal binders can help to reduce changes in blood pressure (orthostatic hypotension) when moving from a lying to standing position and may help to improve breathing after SCI.

What are abdominal binders?

An *abdominal binder* is an elastic piece of material that is placed normally placed around the lower torso to apply pressure to the abdomen. Abdominal binders should fit snugly around the torso and be tight enough to provide support, but should not be uncomfortable. Abdominal binders are typically worn under the shirt and are mainly used to improve circulation and breathing when in an upright position. They are also sometimes used to help maintain balance and stability of the trunk and to support sagging of the abdomen (sometimes called “quad belly”) that can happen when the abdominal muscles are weak.



Abdominal binders wrap around to support the abdomen when the abdominal muscles are weak or paralyzed. They are normally worn under the shirt.¹

What types of abdominal binders are there?

There are two main types of abdominal binders: elastic and non-elastic binders. Each of these types will have a number of different models or designs available that may be used. Talk to your health providers about what type are most appropriate for you.

Elastic abdominal binders

The most common type of abdominal binder used by people with SCI is made from a stretchy elastic fabric that is placed around the abdomen and closed with Velcro. The material mimics the nature of the abdominal muscles by providing some pressure but also allowing the abdomen to expand and recoil while breathing. Some elastic abdominal binders have additional supports built into them that may be used to assist with balance and stability.

Non-elastic abdominal binders

Non-elastic abdominal binders include pieces of equipment such as a corset, girdle, straps or mechanical device to support the abdomen. These are made from a non-stretchy material that provides greater support. Non-elastic abdominal binders are not used as often after SCI because they have greater potential to injure the skin and may also restrict the abdomen while breathing, which may contribute to an abnormal breathing pattern.

Why are abdominal binders used?

Breathing and cough function



People with cervical and thoracic SCI may experience breathing problems because of a loss of nerve control to the diaphragm and other breathing muscles (including the abdominal muscles). This causes the diaphragm to sit too low in the abdomen so it cannot work optimally.

Abdominal binders are thought to mimic some of the function of the abdominal muscles to help support breathing. The binder compresses the abdomen, which increases pressure and may help to raise the diaphragm into a better position for breathing.

There is evidence that abdominal binding in people with tetraplegia can improve respiratory function. Studies have shown that the use of abdominal binders can improve an individual's ability to inhale and exhale. Overtime, the use of an abdominal binder can strengthen the muscles that are used to inhale. The design of the abdominal binder may also influence its effectiveness. For example, one (weak) study found that a custom girdle may cause individuals to perceive breathing as easier.

More research is required to find out how using an abdominal binder strengthens the diaphragm and whether this leads to easier breathing. Abdominal binding for people with SCI should be introduced gradually due to potential adverse effects on one's ability to breathe.

Blood pressure and circulation



Many people with SCI experience a drop in blood pressure when moving from a lying or sitting position to an upright position. This is known as *orthostatic hypotension*. This condition happens because a loss of nerve function can impair the body's ability to tighten (constrict) the blood vessels and change heart rate, which is an important part of maintaining blood pressure in different positions.

Because abdominal binders wrap around and compress the abdomen, they may help to increase pressure in the abdominal area. This may help to prevent blood pooling in the blood vessels in the abdomen when upright, which may help maintain blood pressure and allow better circulation.

There is conflicting evidence based on limited research that abdominal binders have any effect on cardiovascular responses in people with SCI. One study found that abdominal binders do not have any effect on average blood pressure or other cardiovascular responses. However, other studies suggest that abdominal binders in combination with leg stockings may have an effect on cardiovascular responses during lower intensity arm exercise.

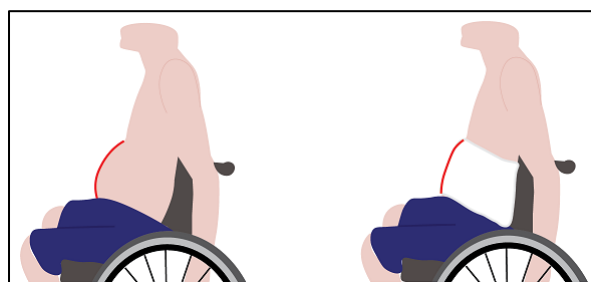
Speech



There is some weak evidence for the use of an abdominal binder to improve speech. One study found that participants with difficulty speaking due to cervical level injuries were able to produce more natural sounding speech, were able to speak louder, and improved overall voice quality with the use of an abdominal binder. Meanwhile, another study has shown that using an abdominal binder can extend the length that sound is produced for.

Balance, stability, and appearance

Some individuals use an abdominal binder as they feel it helps to support their trunk or assist with sitting balance. Additionally, some find that it helps them balance when performing two-handed exercises. However, no research has been done to support this. Also, some individuals may use a binder to reduce the appearance of the abdomen sagging forward, sometimes called “quad belly”.



Abdominal binders may be used to support the abdomen to reduce the appearance of ‘quad belly’.⁵

Are abdominal binders safe to use?

Abdominal binders are considered safe for most people. In all cases, the skin under the binder should be regularly checked for the possibility of a pressure sore. However, there are some situations in which abdominal binders may not be appropriate and some possible risks. Please consult a health provider for detailed safety information.

Abdominal binders should be used with caution in these situations:

- Do not use directly over areas prone to pressure injuries or over current injuries, wounds, or sores.
- Caution is advised if a person has a stoma (colostomy or urostomy bag) on the front of their abdomen. There is the possibility of the binder causing irritation or interference to the stoma site. A customized binder may be required to ensure no irritation to the area.

Risks of using abdominal binders may include:

- Pressure injuries could happen if the equipment is too tight and creates too much pressure or cuts into the skin.
- If the abdominal binder is tightened too much, it can get in the way of the abdomen and lower ribs expanding, which may make breathing difficult.
- Also, an overly tight abdominal binder could cause an increase in spasticity or trigger autonomic dysreflexia in some people.

The bottom line

Abdominal binders are a physical treatment that supports the abdomen when the abdominal muscles are weak or paralyzed. The support from the binder can improve cardiovascular and respiratory responses including blood pressure and breathing. Some individuals may use a binder to help with balance and stabilizing the trunk but there is no research evidence to support this. Some individuals may use a binder to reduce the appearance of abdominal muscles that bulge out following paralysis.

For a review of what we mean by “strong”, “moderate”, and “weak” evidence, please see [SCIRE Community Evidence Ratings](#).

Related resources

SCIRE Community. “Orthostatic Hypotension (Postural Hypotension)”. Available from: community.scireproject.com/topic/orthostatic-hypotension

Abbreviated reference list

This page has been adapted from SCIRE Project (Professional) “Respiratory Management Following Spinal Cord Injury” and “Orthostatic Hypotension Following Spinal Cord Injury” Chapters:

Sheel AW, Reid WD, Townson AF (2018). Respiratory Management Following Spinal Cord Injury. In: Eng JJ, Teasell RW, Miller WC, Wolfe DL, Townson AF, Hsieh JTC, Connolly SJ, Noonan VK, Loh E, Sproule S, Querée M, McIntyre A, editors. Spinal Cord Injury Rehabilitation Evidence. Version 6.0. Vancouver: p. 1-72.

Available from: <https://scireproject.com/evidence/respiratory-management-rehab-phase/>

Krassioukov A, Wecht JM, Teasell RW, Eng JJ (2014). Orthostatic Hypotension Following Spinal Cord Injury. In Eng JJ, Teasell RW, Miller WC, Wolfe DL, Townson AF, Hsieh JTC, Connolly SJ, Noonan VK, Loh E, McIntyre A, editors. Spinal Cord Injury Rehabilitation Evidence. Version 5.0. Vancouver: p 1 - 26.

Available from: <https://scireproject.com/evidence/orthostatic-hypotension/non-pharmacological-management-of-oh/blood-pooling-prevention-in-management-of-oh/>

Full reference list available from: <https://community.scireproject.com/topic/abdominal-binders/#reference-list/>

Glossary terms available from: <https://www.community.scireproject.com/about/glossary/>

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