



# Plain Language Summary

## The Vacuum Bell device for people with Pectus Excavatum | June 2025

### What is pectus excavatum?

Pectus excavatum is a condition where the front of the chest appears sunken. It is caused by the ribs and breastbone growing inwards. It can be noticeable from birth, or it can develop during a growth spurt, typically in young people between 11 and 14 years old. If someone has a pectus excavatum that causes significant physical or psychological issues, they may be offered surgery to correct it. Most patients (approximately 80%) will not have a pectus excavatum severe enough to justify surgery.

### What is the vacuum bell device?

The vacuum bell is a non-surgical device used to treat pectus excavatum. It consists of a flexible silicone cup that sticks to the chest and is connected to a portable vacuum pump. When the pump is used, it creates gentle suction that pulls the breastbone forward. The idea is that, especially in younger people whose chest walls are still flexible, the chest can gradually reshape if the vacuum bell is used most days over several months. In Scotland, people are usually advised to wear the vacuum bell for at least 2 hours a day and to use it for 12 months and longer. Treatment with the vacuum bell device can help improve the appearance of the chest. It may be useful for some people who have pectus excavatum that is not severe enough to require surgery. For others, it may potentially avoid the need for surgery.

### Why is this important?

Pectus excavatum affects people differently. Some individuals don't seek treatment because it doesn't impact their lives. For other people, the sunken chest appearance can cause self-consciousness and affect their quality of life by preventing them from engaging in activities they enjoy. While mild cases usually don't affect physical health, severe cases can impact heart and lung function, making treatment necessary for some individuals. The Scottish National Chest Wall Service in Glasgow has been offering the vacuum bell device as a treatment option since

2018. The number of prescriptions has gradually increased over the 2 years. The Scottish National Chest Wall Service asked for a summary of research studies on the vacuum bell device to ensure that the treatment provided is effective, safe and good value for money. This information will help them deliver the best possible care to patients in NHSScotland.

## What we did

We reviewed published studies on the vacuum bell device to understand its effectiveness and safety. We also estimated the costs associated with using the vacuum bell device. We consulted with experts from NHSScotland and a patient organisation, Pectus Matters. These consultations provided valuable insights into the patient journey, the impact of pectus excavatum on individuals and practical considerations for using the vacuum bell device. Based on the information gathered and expert consultations, we developed recommendations on the use of the vacuum bell device in NHSScotland.

## What we found

The vacuum bell device is effective and safe for carefully selected patients. Studies suggest that treatment is most successful in people who:

- are a younger age at the start of treatment
- have a flexible chest wall
- have a smaller pre-treatment chest wall depth
- are motivated to persist with using the treatment
- have support from parents or carers
- wear the device for longer periods each day
- use it for at least 12 to 24 consecutive months.

More research will help improve our understanding of which patients are most likely to benefit from treatment with a vacuum bell, and to refine treatment approaches for people with pectus excavatum.

## What is our conclusion?

The vacuum bell device should be available as a non-surgical treatment option for selected individuals with pectus excavatum that negatively affects their physical and/or psychological wellbeing. The decision to use the vacuum bell device should involve a multidisciplinary team (for example, surgeons, physiotherapists and psychologists).

### What next?

The SHTG recommendation will be shared with colleagues at the Scottish National Chest Wall Service.

This plain language summary has been produced based on SHTG Recommendation for The Vacuum Bell device for people with Pectus Excavatum, June 2025.