

Inspiratory muscle training in people with spinal cord injury

For people with tetraplegia, regular use of a resistance-based inspiratory muscle trainer (IMT) promotes stronger respiratory muscles and improves lung capacity.

An IMT program has been shown to reduce the risk of developing respiratory complications such as pneumonia after spinal cord injury, by increasing lung volumes and strength of respiratory muscles. This is particularly important in winter, when the incidence of respiratory infections increases.

The training program is easy to complete at home using a lightweight, inexpensive device. After it is set up, training can usually be performed independently.



IMPORTANT: In the current environment, it is recommended for respiratory exercises, including IMT, be completed as an independent activity, as much as possible, to minimise the risk of virus transmission.

Inspiratory muscle training program

- Using the IMT, attach the mouthpiece to the tube and turn the opposite end dial until the red line aligns with the black line at the setting 9cm H₂O.
- With your lips sealed around the mouthpiece, take a deep and slow breath in for 3 seconds, trying to lift and expand your chest.
- Relax and breathe out gently, either by letting air out around the outside of the mouthpiece or by removing your mouth from the mouthpiece and exhaling.
- One deep breath in and a relaxed breath out – this is one repetition.
- Perform 3 – 5 sets of 10 – 12 repetitions, with a short rest in between sets. Do these twice a day for five days per week.*
- To progress the training, try increasing the pressure by 10% every week, or more often if it is very easy. Try to increase the number of repetitions.
- Increase the pressure by turning the dial.

NOTE: If you have any questions, please contact your physiotherapist or spinal cord injury service for more information about IMT or for a more personalised respiratory exercise program and advice.

During this time, telehealth appointments are available for extra support.

CAUTION: IMT should be stopped if you have any respiratory tract infection as it increases the work of breathing. IMT is a technique that should be performed daily, when you are well.

Cleaning the IMT

You may need assistance to set up the IMT and cleaning the device. Good hand hygiene and disposable gloves should be used by your care team.

The device should be washed according to manufacturers guidelines after each use:

1. wash hands
2. put on gloves
3. remove mouthpiece from device and clean both mouthpiece and device in warm soapy water
4. rinse and shake off excess water
5. allow both pieces to air dry
6. remove gloves
7. wash hands.

Different ways of setting up an IMT

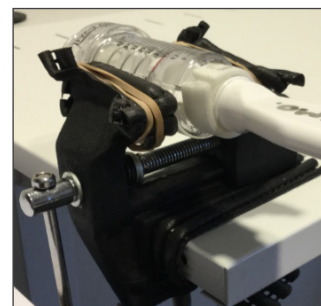
An IMT can be clamped or fixed to a surface to facilitate independent training, particularly for those who have limited arm function. See examples below of flexible or fixed arm devices and the different ways to mount them to remove the need for holding the device.

Commercially available, adjustable microphone holders and mobile phone holders may also be suitable. Many of these items can be found at your local hardware store or online.

Examples of different ways to clamp IMT for independent use:



Custom fabricated clamp



Mounting IMT using vice

NOTE: Take care when lining up a wheelchair with the device - drive slowly towards the IMT.

Document information	
Version number	3
Original publication date	24 April 2020
Developed by	Adapted from advice by Dr Bonne Lee (Prince of Wales Hospital and Neuroscience Research Australia), Dr Chaminda Lewis (Prince of Wales Hospital), Professor Simon Gandevia (Neuroscience Research Australia) and NSW Spinal Outreach Service IMT Client Handout.
Consultation	Spinal Community of Practice; Respiratory Community of Practice
Endorsed by	Nigel Lyons
Review date	28 June 2022
Reviewed by	James Middleton, Clinical Director and Komal Adarkar, Network Manager, ACI Statewide Spinal Cord Injury Service
For use by	People with spinal cord injury and their carers



© State of New South Wales (Agency for Clinical Innovation) 2022.

[Creative Commons Attribution-NoDerivatives 4.0 licence](https://creativecommons.org/licenses/by-nd/4.0/).

For current information go to: aci.health.nsw.gov.au

The ACI logo is excluded from the Creative Commons licence and may only be used with express permission.