



Motor Neurone Disease (MND) and breathing

This leaflet explains what changes can happen with your breathing because of MND and how the Respiratory Department can support with this.

How does MND affect breathing?

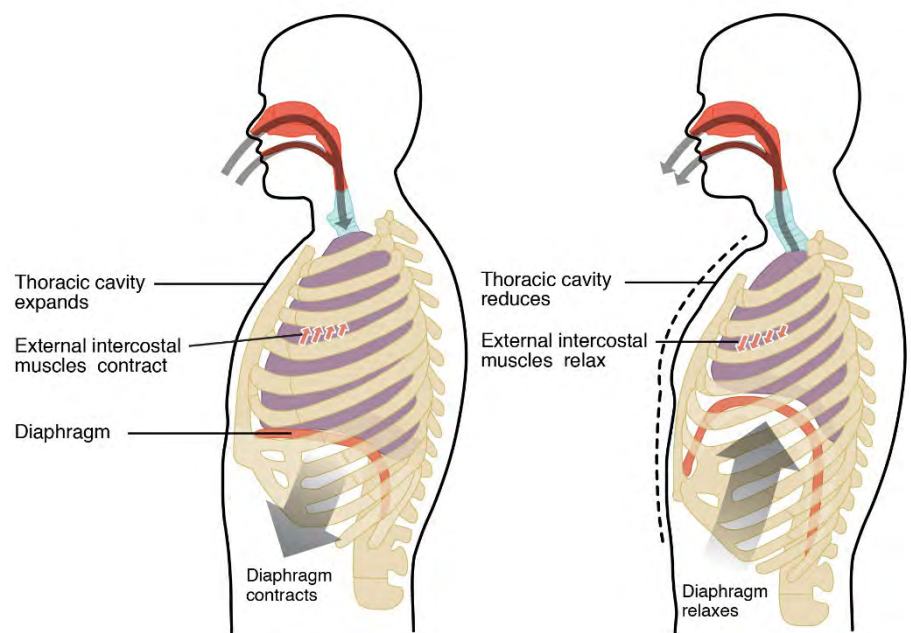
- Messages from the motor neurones (nerve cells in the brain and spinal cord) gradually stop reaching the muscles in the body.
- Muscles weaken and stiffen.
- Symptoms progress at varying speeds – making it difficult to predict.
- Although the disease will get worse, symptoms can be managed to help achieve the best possible quality of life.

Breathing and muscles

Normal breathing involves all muscles that are attached to the rib cage (called external intercostals) and the diaphragm (dome-shaped, muscular layer separating the chest cavity from the abdominal cavity that is used in breathing).

The muscles used in forceful breathing (during exertion and coughing) are:

- internal intercostals
- abdominal muscles
- sternocleidomastoid
- trapezius



Inspiration (breathing in)

Expiration (breathing out)

*Image courtesy of Anatomy & Physiology, Connexions website.
<http://cnx.org/content/col11496/1.6/>*

The mechanics of breathing

Inspiration (breath in):

- Diaphragm contracts and flattens – moving down from the usual dome shape, making the chest LONGER.
- Intercostal muscles pull the ribs up and out making the chest WIDER.
- Small sternal muscles pull the sternum (breastbone) upwards and forwards, making the chest WIDER at the front and back.

= AIR IS SUCKED IN

Expiration (breath out):

- Natural elastic recoil of the lung tissue.
- Diaphragm relaxes and returns to domed shape.

= AIR MOVES OUT

Forceful expiration (e.g. when exerting) or coughing:

- External intercostal muscles, and abdominal muscles contract and pull the ribs down and in and push the diaphragm up.

How can the Respiratory Department help?

When you are diagnosed with MND, it is important to work with the respiratory physiotherapists, consultants and physiologists early on so they can teach you specialist techniques and give you the necessary support and advice on equipment to help you manage your symptoms. They can provide:

- **Help with breathing:**
 - Non-invasive ventilation – provides pressure support for inspiration and expiration and improves your oxygen levels.
 - Medications to help with the symptoms of breathlessness.
- **Help with coughing:**
 - Cough augmentation techniques such as manual assisted cough
 - Breath stacking to help support a larger lung volume for a more effective cough
 - CoughAssist machines – device to help create effective cough pressures
 - Suctioning to remove oral secretions

How to contact the Respiratory department

Please ask your MND nurse to refer you to your local respiratory team.

References

This leaflet has been created using information from:

[What is Motor Neurone Disease? | MND Association](#) [MND Association Recommendations | Motor neurone disease: assessment and management | Guidance | NICE](#)

To find out more about our Trust visit www.royalberkshire.nhs.uk

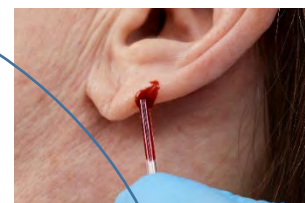
Please ask if you need this information in another language or format.

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Tests we can provide

Muscle assessments:

- SNIP (sniff nasal inspiratory pressure)
- MIP (maximal inspiratory pressure)



Capillary blood gas:

- Small blood sample from the earlobe to look at oxygen levels and other gases in the blood

Oxygen saturation (SpO2)



Peak cough flow:

- Measures how strong your cough is



Spirometry:

- Forced vital capacity (FVP)
- Vital capacity (VC)



Respiratory Tests