

Department of Respiratory Physiology and Sleep

The use of non-invasive ventilation at home (ResMed Stellar 100/150)



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What is non-invasive ventilation (NIV)?

NIV is a commonly used treatment for people who have breathing problems and require help with ventilation. Chronic lung diseases such as COPD and emphysema, neuromuscular conditions, chest wall deformities or problems related to being overweight may cause problems in breathing resulting in low oxygen and high carbon dioxide levels in the blood.

Why do I need non-invasive ventilation (NIV)?

Normally your lungs have two purposes:

- To draw air/oxygen into your lungs. Oxygen is needed to help provide energy for your body to work properly.
- To blow out carbon dioxide. Carbon dioxide is a waste gas produced by your body from chemical reactions and processes.



Patient Information

If you have a condition listed above your breathing may be affected. This can mean that you:

- Struggle to supply your body with oxygen. If oxygen levels drop too low this is dangerous.
- Struggle to get rid of carbon dioxide. Having too much of this in your body is very dangerous.

The problem is usually worst at night, because when we are asleep we breathe more slowly and less deeply. This results in some of the symptoms you may be experiencing currently, like headaches in the morning and tiredness. It may feel as if you haven't had a refreshing sleep. Other people may not feel like anything is wrong.

What does NIV do?

NIV blows air into your lungs as you breathe in. This will help you take bigger breaths than usual, and it will support your muscles to make your breathing easier.

The NIV helps you to breathe more effectively and so your body will be able to get oxygen in and carbon dioxide out of your lungs more easily. This should help to relieve the symptoms you may be having. It will also reduce admissions to hospital and improve quality of life and survival.

As well as blowing in air as you breathe in, the NIV will also blow in air at a lower pressure as you breathe out. This pressure helps to hold open your airways and is particularly important for people who have conditions such as obstructive sleep apnoea.

Using the machine

NIV needs to be used regularly every night and for at least 4 hours for it to be effective. You will be informed of the most appropriate amount of time for you by your healthcare professional. It is very important to keep as close to the recommended plan as possible. If the NIV is constantly on and off, it will not work effectively.

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It should not cause you a problem if for some unavoidable reason you are unable to wear the machine for one night. However, if you don't wear the NIV machine enough, over time it will not be able to work sufficiently well.

The following equipment will be supplied to you:

1. The NIV machine which generates the prescribed pressures to aid your breathing.
2. Circuit tubing to deliver air from the ventilator to the mask.
3. A full face/nasal mask or nasal pillows (these vary in size and shape).

You may also have:

- Green oxygen tubing
- A humidifier to make the air from the machine less dry

How do I set up the machine?

The settings on the machine will already have been programmed by the NIV team. These settings should not be altered in any way whilst you are at home. To avoid this, try to prevent children from playing with the machine.

1. The NIV machine should be placed on a flat surface near the head of your bed, such as on top of a bedside cabinet.
2. Make sure that the air inlet at the back of the machine is not blocked and is free from any dust or bedding.
3. Carefully connect the tubing to the front of the machine.
4. Carefully connect your mask to the other end of the tubing.
5. If you have oxygen, the oxygen tubing connects to the oxygen connector at the rear of the machine.

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How do I turn the machine on/off?

1. To power on/off the device the switch is at the back of the machine to the side of the power lead. Press the switch to power up the device. To power down the device, press the switch and then confirm using the push dial on the front of the device.

Push dial



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2. Press down on the black button on the front of the machine. This will start the machine.

Start/Stop



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3. To stop the machine press down on the black button on the front of the machine and confirm by pressing the push dial.

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How do I put the mask on?

If you use oxygen with your NIV machine you should make sure this is attached and switched on before applying the mask. It is recommended that you put the mask on first and then immediately start the machine.

Full face mask:

Hold the mask to your face, the bottom of the mask should sit just below your bottom lip and the top should sit on the bridge of your nose.

Nasal mask:

Hold the mask over your nose and then pull the strap over the back of your head, making sure the clear plastic adjustment strap is over the top of your head.

Make sure you can open and close your eyes and the mask is not squashing them. Fasten the headgear by inserting the clips into the side of the mask. You may need some help doing this at first.

If the mask feels too loose, use the individual straps at the front of the mask to adjust the fitting. This can be done more effectively with the machine turned on.

How do I check that the mask is fitted properly?

The mask needs to fit comfortably on your face. There should be a small amount of give in the straps so that you are able to pull the mask away from your face slightly. You should have the mask as loose as possible without allowing air to leak from around the edge of you mask, especially into your eyes, or causing the machine to alarm.

If you wear dentures, make sure they are securely fitted and try to wear them when the mask is on as this will give a better fit.

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How do I check for a leak?

You will notice holes within your mask. These are specially designed to allow carbon dioxide to escape. **Do not cover these holes**, as this can prevent the carbon dioxide from escaping.

Although a leak is allowed from these holes, it is important to try and reduce any leak from elsewhere around the mask. A leak may cause irritation to the face and may cause the machine to be less effective.

To check for a leak, feel around the mask whilst you are wearing it and with the NIV machine turned on. If you can feel air escaping from anywhere other than the carbon dioxide vent, then try adjusting the individual straps at the front of the mask. Any adjustments here should be made using the pairs of straps to make sure the mask is kept central on your face. If you cannot reduce a leak entirely, do not make your face sore by over tightening the mask.

How do I look after my equipment?

Daily tasks:

- Wash around the mask with warm soapy water and damp cloth to remove oils produced by your skin overnight. After washing, rinse and air dry the mask.
- If you have a humidifier, then carefully disconnect the tubing, and empty out any excess water that may have collected. The tubing may be hung up over a door or shower rail to dry. Replace the water in the humidifier up to the fill line with bottled water or boiled water that has cooled down.
- **Do not tilt the machine whilst there is water in the humidifier. This may cause water to get into the machine and stop it from working.**

Weekly tasks:

- Carefully disconnect the tubing from the mask and the machine.
- Wash the mask, headgear, and tubing in warm soapy water. Once done, rinse in clean water and then allow to dry. **Do not machine wash or tumble dry. Avoid placing in sunlight or directly on a radiator.**

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- To reattach the headgear to the mask, place the straps on a flat surface with the fleece side down. Lay the mask on top of the headgear and then feed the straps through the gaps on the mask.
- If you are using a bacterial filter, change it weekly or if it becomes damp or has visible dirt.

Monthly tasks:

Check the air filter for holes or blockages of dirt or dust, replace if damaged or at least every six months.

Yearly tasks:

Your NIV machine should be serviced as the engineer state is necessary. There will be a sticker on your machine that has a date for the next service. Your machine will also be checked by a member of the NIV team when you attend for your clinic appointments in the ventilation clinic.

Common problems / Frequently asked questions

How long will it take to get used to my NIV machine?

This can vary from person to person. Most people will have gotten used to their NIV during a hospital stay. However, going home with the machine can feel worrying and unsettling. Most patients feel quite happy with the machine when they return for a clinic appointment about 4 weeks later.

How soon after starting NIV should I notice an improvement?

This can depend on the symptoms you experience. Most patients will notice an improvement in their symptoms as their NIV usage increases.

Will I have to wear the NIV for the rest of my life?

It is likely you will. Most people that need NIV have a long-term condition which will not improve, and therefore will need to continue to use the NIV.

Will the settings on the NIV need adjusting?

Sometimes this may be necessary. After some time, and as you become

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comfortable with using the machine, we may need to alter the settings to fit your need. This will be done at the hospital during a clinic visit or if you need to come into hospital.

You should not try to adjust the settings yourself.

Areas of my face have become red and feel sore

It is not uncommon for people wearing the NIV to feel some soreness around their face, particularly over the bridge of the nose. Most often this can be corrected by adjusting the mask and making sure not to over tighten it and following appropriate daily facial and mask hygiene. Sometimes you may need to wear an alternative mask which will be fitted by your healthcare professional.

It feels like air is leaking around my facemask when I am using the machine

When the mask is properly fitted this should not happen. On most machines, the amount of leak can be seen on the display. All machines are different, but a leak of up to around 24L/min will not cause any problems to the way most NIV machines work. However, if you find the air leak uncomfortable you should adjust the mask to reduce the leak.

I can't turn on the machine:

- Check that the power lead is firmly attached.
- Make sure the machine is turned on at the wall and at the back of the machine.
- Press down on the black button on the front of the machine once. You should see a green bar appear on the left-hand side of the display screen.

If you are still having problems, contact the **Respiratory Physiology and Sleep Department Home NIV Team** on **02476 966 734**. This service is available **8am to 5pm, Monday to Friday**.

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Out of these hours please contact the NIV nurses on ward 30 at UHCW on 02476 966678.

How do I know if my machine is working?

The screen on the front should light up and you should feel air being blown through the mask.

The mask is broken or difficult to reassemble:

Contact the **Respiratory Physiology and Sleep Department home NIV team** on **02476 966734**.

What happens if my machine breaks at the weekend or if there is a power cut?

If you are unable to use the machine overnight on the odd occasion, simply wait until Monday when you can contact the home NIV team. However, if you start to feel unwell then you should contact your GP, out of hours GP/walk in centre or come into Emergency Department.

- NIV is not a life support therapy and therefore you should not be over concerned if your machine breaks and you cannot use it for one night.
- In the case of equipment failure, you can call the Respiratory Physiology and Sleep Department on **02476 966734**. During weekends and bank holidays, urgent support can be provided by the NIV nurses on ward 30 on **02476 966678**.

What should I do if I become unwell?

If you become unwell, you should take the steps you would normally take in seeking medical advice.

What if I press some of the other buttons on the machine by mistake?

This should not alter your settings. However, if you are concerned that your NIV machine is not working properly contact the home NIV team during the advised times.

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What do I do if I need to go into hospital?

It is advised that you take your NIV machine for all admissions as this will help your doctors and the rest of the team know what treatment you are receiving.

The Trust has access to interpreting and translation services. If you need this Information in another language or format, please contact 02476 966734 and we will do our best to meet your needs.

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