Non-Invasive Ventilation (NIV)

Information for patients and families of patients

This leaflet can be made available in other formats including large print, CD and Braille and in languages other than English, upon request.
This leaflet will help you and your family understand what non-invasive ventilation treatment is and why it is being used. This leaflet aims to answer all of your questions, but we want you to ask about anything that you are still unsure of or are worried about.

**What is Non-Invasive Ventilation (NIV)?**

Non-invasive ventilation uses a machine to help with your breathing. It is a bedside machine, connected to tubes and a mask, which is worn over your nose and mouth. As well as helping with your breathing, it supports your lungs, giving your body the chance to heal.

**Why do I need NIV?**

Your breathing has become difficult, which has led to a build-up of the waste gas carbon dioxide (CO₂) in your body. This often happens when there is an existing problem with your breathing, such as Chronic Obstructive Pulmonary Disease (COPD), which then has a flare up, during an acute episode.

Your breathing can also be affected because of other reasons. Your lungs may struggle to breathe if you are overweight or if you have weakened breathing muscles.

A build-up of CO₂ in your body is very dangerous and different treatments may be able to help with this.

**How will a build-up of carbon dioxide make me feel?**

This is different for every patient but the common symptoms can include:

- **Breathlessness.** This will be worse than your normal level of breathlessness
• **Tightness in your chest.** You may feel your chest is tighter than normal and you are working harder to get air in and out of your lungs.

• **More wheeze than normal.** You might be aware of more wheeze than normal if you have an airway problem affecting your chest, such as COPD. You might also have noticed that you have been using more of your reliever inhaler recently.

• **“Fuzzy” thinking, difficulty concentrating and confusion.** Low oxygen and high carbon dioxide levels can make it difficult to concentrate, leading to confusion and in some cases unconsciousness.

**How will I know if I need this treatment?**

After you have been admitted to hospital, the medical team will take a sample of blood from one of your arteries (blood carrying vessels), usually in your wrist. This is called an arterial blood gas. This will tell the team the oxygen, carbon dioxide and acidity levels of your blood.

If your oxygen level is low, your carbon dioxide level is high, and your blood has become acidic, then you may need this treatment.

Your team will give you standard medical treatment for 60 - 90 minutes to try to improve your condition and, hopefully, avoiding the need for NIV.

They will then repeat the blood test to see if this has improved. If it has improved, then they will continue this treatment. If it has not improved and your blood is still acidic, then your team will want you to have non-invasive ventilation.
What other tests might I have?

You will normally have some other tests as the team assess you, including:

- **Chest X-ray.** This is to check for lung problems, such as pneumonia, infections, fluid and air leaks, which may have caused your lung condition to flare-up.

  A chest X-ray is also used to check if there is a reason that would stop the team giving you NIV.

- **Blood tests.** You will normally have blood tests to check your blood count, kidney function, liver function and for signs of infection. This helps the team decide what other treatment may help you to get better, as well as non-invasive ventilation.

- **Heart tracings.** These are known as ECGs. They check that your heart is healthy and that it is not under strain because of your lung condition.

How is the treatment given?

Your treatment will take place on the Emergency Department, Emergency Admissions Unit or on the Respiratory Ward.

Non-invasive ventilation is used when your breathing is very poorly, and we know this can be a frightening experience. NIV can feel strange, but it will help you to get people better. The Nurses are very experienced and will be there to help you at every stage of your treatment.
Preparing for the treatment

The Nursing staff will set up the breathing machine next to you. They will check that you are using the right sized mask. This is a very important step. If you are not happy to use a standard mask, other masks can be used.

The mask will then be attached to the machine by a long tube. The machine will then be started and you will hear a loud sound of rushing air.

Starting the treatment

The Nurse will hold the mask gently on your face (you can do this yourself if you are able to and wish to do so). This will allow you to get used to the sensation and breathing with the machine.

Once you are comfortable, the mask will be secured with some soft straps that will secure around your head. The mask should fit snugly and firmly around your nose, cheeks and chin but should not be painful or uncomfortable.

The team will adjust the pressure of the air flowing into your lungs until they are happy that settings are correct.

How do you know if the treatment working?

Firstly, the team will monitor you to make sure your breathing is becoming more relaxed and effective after the treatment has started.
After you have been on the breathing machine for 60 – 90 minutes, another blood sample will be taken from the artery in your wrist. If this blood test shows that the oxygen, carbon dioxide and acidity level in your blood are better, then the treatment is working and no changes will be made.

If this blood test shows that things have not improved, then the team will make some adjustments and check again to see if this has had an effect.

**How will I be monitored?**

The Nurse looking after you will check you very regularly. They will check to make sure that there are no problems with the mask and help you take any food or drinks you need.

You will also have your oxygen level monitored continuously the first 24 hours, at the least. This will make sure that you are having the right amount of treatment.

The Doctors will see you every day and check that the treatment is working well.

**Will I be awake when the treatment is given?**

Yes, you will be awake. We understand that this can sound frightening. Most patients adjust very quickly to the breathing machine and cope well with the treatment.

Some patients are given small doses of sedation to help with anxiety or panic, but the majority of patients do not need this.

**Can I eat and drink while having the treatment?**

Yes. In the first 24 hours, you will need to wear the breathing mask as much as possible, but you will be allowed regular breaks to eat and drink.
As your treatment goes on, you will spend more time off the breathing machine and you will be able to eat and drink as you normally would.

**Will I need to stay in bed?**

You will normally stay in bed for the first day, while you get used to the treatment and you receive any other treatment you need. If you are able, you can get out of bed during this time.

As soon as you are happy, we would advise you to get out of bed and start moving around. This is to make sure your muscles stay as strong as is possible, as this will help you recover sooner.

**Are there any possible side effects?**

This is a very safe treatment and the majority of people have no side effects. However, there is a possibility of the following side effects:

- **Pneumothorax (also known as “collapsed lung”).** The breathing machine increases the pressure of the air going in to your lungs. Some conditions such as COPD and emphysema are sensitive to this and it can cause your lungs to over expand.

  This can cause an air leak from the lung inside the chest and cause the lung to collapse. If this happens, you would need to have a treatment called a chest drain.

- **Sickness and vomiting.** The increased pressure inside your mouth and upper throat can cause air to be forced in to your stomach. This can over inflate your stomach and make you sick or vomit.
• **Low blood pressure and irregular heart rhythms or pulses.** Very rarely, this treatment can cause your blood pressure to fall (this could make you dizzy or faint) or cause an irregular heart rhythm or pulse.

• **Nasal bridge pain or ulcers.** Even though the face mask does fit snugly over your face, it has a soft cushion that normally stops it from causing any problems on your skin.

  Occasionally it can cause pain over the bridge of your nose and, very rarely, can cause ulcers. The Nurse supervising your treatment will monitor you closely to make sure this is not happening.

• **Feeling of claustrophobia.** You may feel some claustrophobia at the very start of the treatment. Most people get used to this very quickly, especially when they feel the benefits on their breathing.

  Some patients will find it difficult. We can help you by using a different mask that surrounds your whole face. Small doses of medicine to relieve anxiety can also be used to help you.

**Will I have any other treatments?**

This will depend on what has caused you to need NIV. If you had pneumonia or an infection, you would get antibiotic treatment. If you had a lung problem, such as COPD, which has flared up you might also get steroid tablets and treatments called nebulisers.

Nebulisers involve muscle relaxants, which are given by a mist that you breathe in through a special facemask, to help make your breathing easier.

You may also be seen by a specialist Physiotherapist. This will help to improve your ability to cough and clear your chest.
How long will I need this treatment?

Most people will stop this treatment after three days. It will help you if you follow this schedule for the first three days:

<table>
<thead>
<tr>
<th>Day</th>
<th>Length of Treatment</th>
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<tr>
<td>Day 1</td>
<td>As much as possible, including overnight when sleeping, with short food and drink breaks.</td>
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<tr>
<td>Day 2</td>
<td>16 hours (including 6 - 8 hours overnight). Usually this means 1 - 2 hour breaks in the morning, afternoon and evening.</td>
</tr>
<tr>
<td>Day 3</td>
<td>12 hours including 6-8 hours overnight.</td>
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Some people may take longer to recover. This is perfectly normal and the schedule above is only a general plan and can be adjusted to what your needs. Some patients might be able to end the treatment before the 3-day schedule, but this is very uncommon.

Are there any alternative treatments that I could have?

NIV is the best and most effective treatment to help you get better from this problem. If you do not want this treatment, or you are not able to tolerate it, then we would consider other ways to help you get better.

We would do this by giving you very controlled amount of oxygen through a facemask or very occasionally through a treatment called High Flow Nasal Oxygen Therapy. We would also use any other treatments mentioned above to help you get better. However, this approach is much less effective than NIV.
What happens if the treatment is not working?

This is a serious illness and even with the best of care, some patients will not survive if NIV is unsuccessful. We do have to think about what to do if the treatment does not work.

Before starting the treatment, the medical team will think about what to do if it does not seem to be working or if you are deteriorating while receiving the NIV.

If things are not going as hoped, the team may feel that going to intensive care and potentially being put to sleep and going on a ventilator may allow time for your body to recover. This is more likely if you had a better state of health and level of fitness before becoming unwell.

Some people, especially those who have been unwell for a long period or who have become very debilitated by their lung problem, may not be suitable for this type of treatment.

In this case, every effort would be made to try to make this treatment effective. If this is not possible, your team would talk about stopping treatment and focusing on keeping you as comfortable as possible.

As part of the discussion about your care, especially if you are not suitable for intensive care, the team will discuss what they could do if your heart or breathing stops. This is called a cardio respiratory arrest.

If the team feel that they are doing everything they can and that treatment for this, known as resuscitation, would not work, they will explain why.

As part of this discussion, if they feel it is right to make this decision in advance of any potential future deterioration, they may sign a form called a “Do Not Attempt Cardio Pulmonary Resuscitation”.
This would inform others that if you were to suffer a cardiorespiratory arrest, not to attempt resuscitation because it would not work.

You may have thought about these issues yourself before becoming unwell. You may have already decided that you would not want to go to intensive care or to have resuscitation, even if your team believe they will work. If you have, please tell the team so that your wishes can be documented in the notes.

**What can I do to help me get better and stay well?**

When you are in hospital, the best thing you can do is to get moving as soon as you can. The Physiotherapists will give you exercises to do at your bed. These will help strengthen your muscles and help to get you better sooner.

- **Smoking.** If you smoke, please tell the team looking after you. Please do not feel that you should keep this a secret, as the team will not judge you and will help you to stop smoking while you are in hospital.

  We can give you Nicotine replacement products, which will help “take the edge off” any cravings and let you focus on getting better. In the longer term, stopping smoking will reduce the chances of you needing this therapy again.

- **Weight.** If you are over or under weight, we can arrange for you to speak to a dietitian as bringing your weight closer to normal can reduce the chances of you needing this treatment again.

- **Exercise.** After you have discharged (left hospital), if you are able to, we will invite you to a lung exercise training class called “Pulmonary rehabilitation”.
This training class is designed for people with chronic lung or breathing problems. This can improve your fitness and cut down the chance of you being readmitted to hospital.

**What are the chances of me coming back into hospital again with the same problem?**

The chance of a patient coming back into hospital after this problem will be different for everyone. Between 1 in 4 and 1 in 5 people who have been admitted with a flare up of COPD (also known as an exacerbation) will be readmitted within 30 days, even if they have not required NIV.

The chance for a patient who has required NIV is probably higher, but there aren’t many studies that have been done, looking at this in detail.

**If I come back to hospital with the same problem, what other treatments might help me?**

Your team would look closely at your treatment for your lung condition to make sure that you are on the right combination of medicines and treatments. Despite this, some patients could continue to have admissions with the same problem.

For these patients, we do consider offering a breathing machine to allow them to have non-invasive ventilation every night at home, while they are sleeping.

This can reduce the chance of having hospital admissions with this problem. If the medical team think you are suitable for this, they will explain how this would be organised.
Images used in the making of this leaflet:


Image 2: How to initiate noninvasive ventilation program in your hospital, Abdullah Alshimemeri, Published in 2013, https://www.semanticscholar.org/paper/How-to-initiate-noninvasive-ventilation-program-in-Alshimemeri/120c78375028781c6653bca7a2214bbb763030d0
This leaflet has been produced in partnership with patients and carers. All patient leaflets are regularly reviewed, and any suggestions you have as to how it may be improved are extremely valuable. Please write to the Clinical Governance Team, North Tees and Hartlepool NHS Foundation Trust, University Hospital of North Tees or Email: nth-tr.leaflets@nhs.net

Comments, Concerns, Compliments or Complaints

We are continually trying to improve the services we provide.

We want to know what we’re doing well or if there’s anything which we can improve, that’s why the Patient Experience Team is here to help.

Our Patient Experience Team is here to try to resolve your concerns as quickly as possible. If you would like to contact or request a copy of our PET leaflet, please contact:

Telephone: 01642 624719  
Monday – Friday, 9.30am – 4.00pm  
Messages can be left on the answering machine and will be picked up throughout the day.

Freephone: 0800 092 0084

Email: nth-tr.PatientExperience@nhs.net

Out of hours if you wish to speak to a senior member of Trust staff, please contact the hospital switchboard who will bleep the appropriate person.

Telephone: 01642 617617  
24 hours a day, 7 days a week

The Patient Experience Team is available to discuss your concerns in person Monday – Friday, 9.30am – 4.00pm. The office is based on the ground floor at the University Hospital of North Tees.

Data Protection and use of patient information

The Trust has developed a Data Protection, Caldicott and Disclosure Policy (IG5) in accordance with the Data Protection Legislation (General Data Protection Regulations and Data Protection Act 2018) and the Freedom of Information Act 2000. All of our staff respect this policy and confidentiality is adhered to at all times. If you require further information please contact the Information Governance Team.

Telephone: 01642 383551 or Email: nth-tr.infogov@nhs.net

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