

Non-invasive ventilation (NIV) at home

Information for patients using an A40 AVAPs
non-invasive ventilator



What is non-invasive ventilation (NIV)?

NIV is a treatment that can help you breathe more easily if your breathing problem is getting worse. NIV supports your breathing but does not take it over. It involves you using a cushioned mask that fits over your mouth and nose (Figure 1) or just your nose (Figure 2) which is connected to a ventilator machine that blows air as you breathe.



Figure 1
Full face mask



Figure 2
Nasal mask

Why do I need NIV?

When you breathe normally you take in oxygen for your body to use and breathe out the waste gas carbon dioxide. Breathing in enough oxygen and blowing out enough carbon dioxide might have become more difficult for you. NIV helps your breathing by blowing in extra air as you breathe. This helps correct your oxygen and carbon dioxide levels.

What are the benefits?

NIV improves the effectiveness of your breathing and can reduce the work of breathing for your muscles, which can make breathing easier for you. Other benefits may include improved sleep quality, reduced sleepiness in the day and less frequent morning headaches.

What are the side effects?

- The face mask may make you feel claustrophobic.
- Air may leak from around the mask and cause eye discomfort.
- If you swallow some of the air it can lead to trapped wind or bloating. If this happens, the settings on your machine may need to be changed.
- The mask may cause sore skin on your face or make your skin break down over the bridge of your nose. If you find this is a problem, you may need to try different masks or use extra liners to create a comfortable fit.
- You may find it harder to clear spit and phlegm from your throat and nose when you wear the mask. You may need to remove the mask for a few minutes to spit it out.

What are the risks?

Pneumothorax (lung collapse). This is very rare and only happens if the machine is set at high pressures. It is caused by an air leak from the lung which becomes trapped between your lung and chest wall. It may cause sudden sharp chest pain, which is worse when you breathe in, and breathlessness. You will need to attend your local A&E urgently if this happens.

How often should I use the NIV machine?

It is important to use your NIV every night, for a minimum of 4 hours (ideally the whole night if you can). You should also use your NIV if you sleep in the daytime. Your doctor will tell you if you need to use your NIV any more than when you are asleep.

If you are having any doubts about how often you should use your NIV, you can contact the Chest Unit or your doctor.

Do I still need to take my normal medication while using NIV?

Yes. You should take all your usual medicines unless advised otherwise by your doctor. You can take the mask off if you need to take your nebulisers, inhalers or pills.

Will I have follow-up appointments for my NIV?

You will be seen regularly in the Chest Unit to ensure your treatment is going well. You also may be seen regularly in the Sleep and Ventilation clinic.

It is important that you attend all of your appointments to check that your NIV therapy is effective and to discuss any problems you may be having.

If you do not attend your appointments, the Home Ventilation team will not be able to accept responsibility for the safety of the NIV machine or your treatment.

Remote monitoring

Some of our A40 NIV devices may temporarily be fitted with a device called a modem which is able to send us information about the effectiveness of your NIV treatment. It can also tell us how often you are using it and if your mask is fitting properly. This will enable us to optimise your treatment while reducing your number of hospital visits.

The modem sends your data securely. It does not use your internet connection and so will not cost you anything when it sends us the information. We will always ask your permission first before fitting the modem.

Traveling with NIV

The A40 is suitable for use on airlines when it is operating from an AC or DC power source. It is not suitable for airline use with any

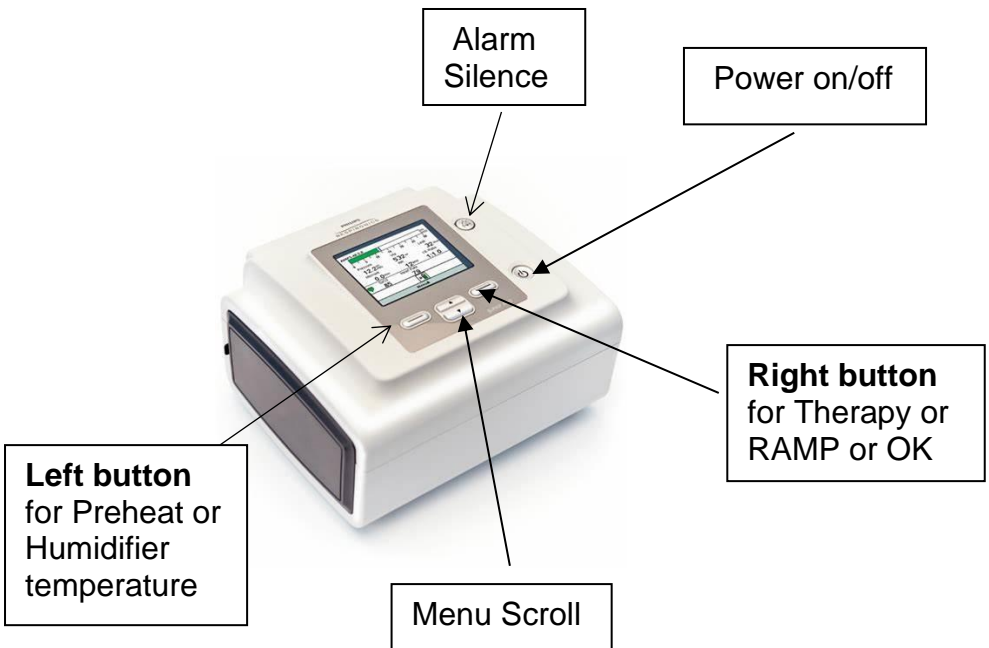
modems or humidifiers installed. Please check with the airline prior to flying if you are planning to use your A40 during a flight.

Please take the machine on to the plane as hand luggage, to avoid accidental damage. Do not check the NIV ventilator into the plane cargo or hold.

If you are going abroad, please contact the Chest Unit so that we can supply you with a letter for the airline and customs.



Using my A40 ventilator

Figure 3:





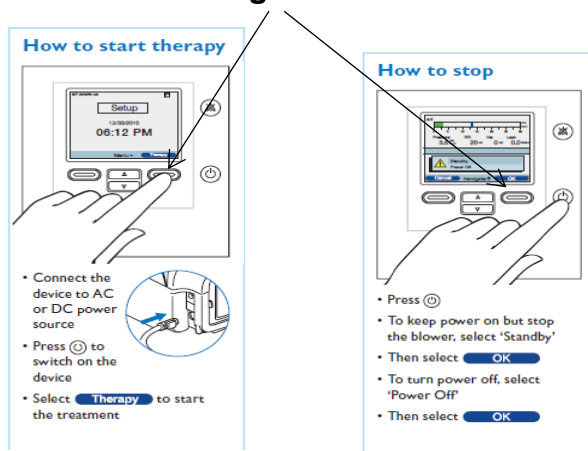
How do I turn it on and off?

Place the A40 NIV machine on a clean flat surface (not on a carpet). Do not put it inside a bedside cabinet or anywhere the air cannot move freely around it.

- Connect the power lead to the adapter and then the adapter connector to the back of the A40.
- Plug the other end of the lead into the mains power socket and switch the socket on.
 - The power  switch on the top of the A40 machine will light up green.
- Press the power switch  on top of the machine to enter standby mode.



- To start the flow of air press the **right** button under 'therapy'. See Figure 3.
- To stop the flow of air press the power button  and then the **right** button under "OK". See Figure 3.
- To turn the power off completely press the power button  and the **right** button under 'Yes'.




A40 features to help with my treatment

Ramp

The A40 ventilator has an optional 'Ramp' feature. If enabled, it reduces the air pressure produced by the machine while you are initially trying to go to sleep. The pressure will then gradually increase until your prescription setting is reached, by which time you will hopefully have already fallen asleep.



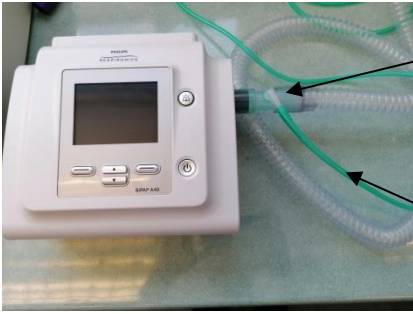
If the ramp function is enabled on your device and you wish to activate it, first turn the flow of air on, adjust your mask so that it is not leaking, and then press the **right** button under 'Ramp' ().

Will I need to use oxygen with my NIV?

Some patients will need additional oxygen therapy alongside the NIV treatment at night. If you are deemed in need of oxygen, our Home Oxygen team will arrange for an oxygen concentrator machine to be delivered to your home.

We will show you how to connect oxygen to your A40 NIV machine before you leave hospital. One end of the oxygen tubing should be attached to a connector piece that we will provide you (see below), and the other end should be attached to your oxygen concentrator.

Your oxygen concentrator should be set at litres per minute when connected to your NIV machine.

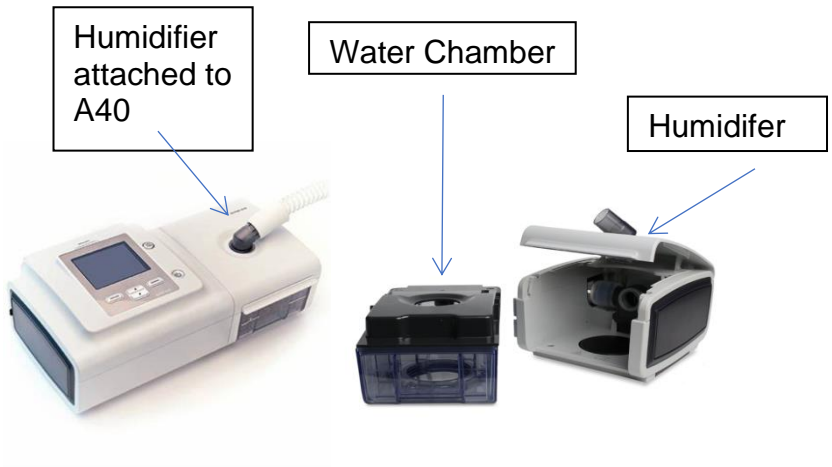


Oxygen connector piece

Oxygen tubing that connects to your oxygen concentrator

Will I need to use a humidifier as well?

We might decide that breathing damp (humidified) air will help you if you have a productive sticky cough (you cough up phlegm or mucus) or a dry mouth.



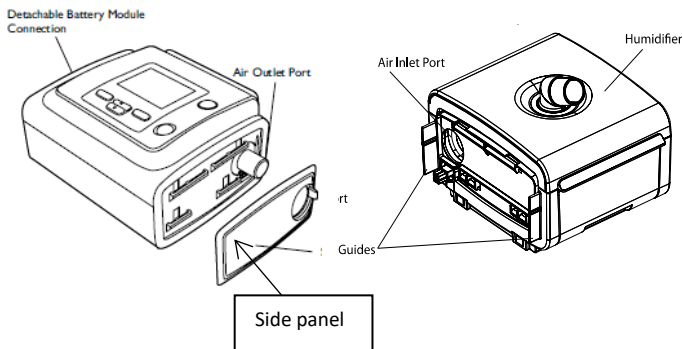
Humidifier attached to A40

Water Chamber

Humidifier


Attaching the humidifier to your A40 NIV machine

Remove the tubing and the side panel (if present).



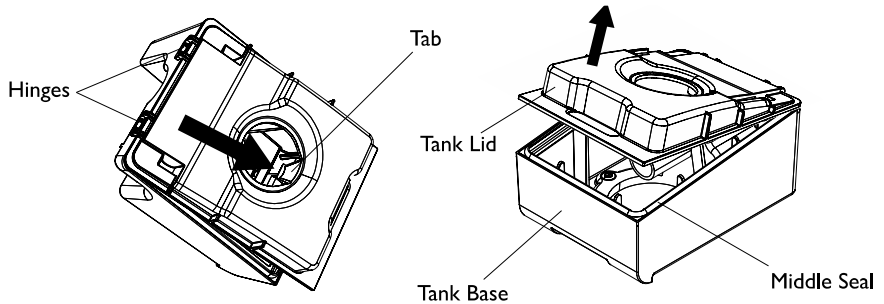
Line up the A40 and humidifier side by side. Make sure that the guides on the humidifier fit into the slots on the therapy device and the air outlet port on the therapy device fits into the air inlet port on the humidifier.

While holding both the A40 and the humidifier, press the two units together until they click into place. Make sure that the therapy device and the humidifier are completely seated against each other.

When the humidifier is attached, the symbol  will appear on the main screen.

Filling the humidifier with water

1. Lift up on the release lever to open the humidifier door until it locks in an open position. You will hear a “click” once the door is opened far enough to remain in an open position. Remove the water tank by grasping the front of the chamber and sliding it out of the humidifier base.
2. Press the tab in the hole on top of the chamber in towards the front of the chamber. Gently remove the chamber lid from the chamber base. Empty any remaining water.



3. Rinse the chamber with water. With the water chamber sitting on a flat surface, fill it with cooled boiled water from the kettle. Do not fill higher than the maximum fill line located on the front and both sides of the tank.
4. Reassemble the chamber by placing the hinges on the chamber lid over the 2 tabs on the back of the chamber base. Close the lid until the tab on the lid snaps back under the lip in the chamber base.
5. Slide the water tank back into the humidifier and close the humidifier door.
6. Connect the tubing to the air outlet port on the top of the humidifier.

Warning

The humidifier must be level for proper operation. Do not place the humidifier directly onto carpet, fabric or any other flammable materials. Take precautions to protect furniture from water damage.

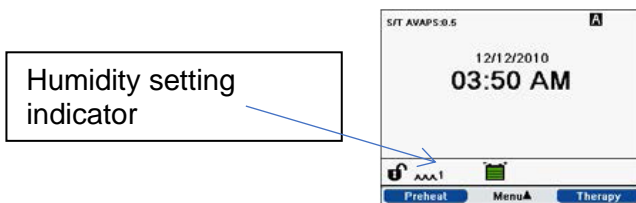
Important

- Do not fill the chamber while it is still inside the humidifier.
- Only use water that you have first boiled then cooled (or distilled water) to kill any bacteria.

- Change the water in your humidifier every day to prevent mould and bacteria growth. Any remaining water in the morning should be disposed of.
- Do not put any chemicals or additives into the water as these may irritate your airway or damage the water tank.
- Warning: Be very careful of the heater plate, heated water or tank pan.
- Do not attend your NIV review appointments with water in the humidifier chamber.
- If you are getting moisture or water inside your mask and tubing the humidifier is set too high. Turn the temperature down to a lower setting.

Adjusting the humidification level

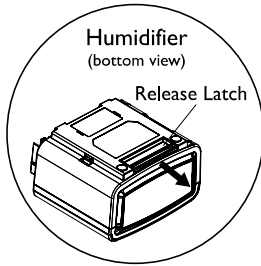
While the A40 is in standby you can activate the preheat function by pressing the **left** button under 'pre-heat'.



To adjust the humidity, start the flow of air by pressing the **right** button under 'therapy'. Then press the left button under 'humidifier'. Increase or decrease this setting from 0 to 5 in increments of 1 by repeatedly pressing this button. When the setting is 0, the humidifier is off. 0 is the lowest humidity setting and 5 is the highest setting.

Disconnecting the humidifier from the A40 NIV

Grasp the release latch on the bottom of the humidifier. While holding both the A40 device and the humidifier, pull the release latch and pull the two units apart.



Looking after my A40 NIV machine

Machine care

Keep the A40 machine clean and dust free.

If you are using a humidifier:

- You can wash the chamber in warm soapy water in the top drawer of a dishwasher.
- If you get a build-up of lime scale, you can fill the chamber with one part lemon juice to nine parts boiling water and leave to soak for three to four hours. Make sure that the solution is rinsed off thoroughly before re-using.

One of the Chest Unit team can show you how to clean the different parts of your machine and give you any new or replacement parts you may need.

Mask care

Always wash your face before putting on your mask to remove facial oils and make-up. Do not put moisturiser on your face at night as this may stop the mask from sealing.

If you look after your mask it should last a year. If it breaks or starts to leak a lot, contact the Chest Unit for a new one.

Daily

- Take the mask cushion or nose pillows off the straps. Clean with warm soapy water, rinse and leave to dry.
- Do not use alcohol on the mask as this can damage it.
- Do not put it in the dishwasher or very hot water.

Weekly

- Take off the straps, wash in warm soapy water and leave to dry.

Tubing care

Clean the tubing before you first use it.

Weekly

- Detach the flexible tubing from the NIV machine.
- Gently wash the tubing with warm water and a mild detergent.
- Rinse well.
- Hang it over a chair or the back of a door to drip dry.
- Check the tubing regularly for holes. These can cause a High Flow Alarm to sound.

Filter care

The air filter at the back of the machine prevents dust from entering the machine. You should clean it every two weeks and replace it every six months or if it becomes damaged.

Foam filter



- If the device is operating, stop the airflow. Disconnect the device from the power source.
- Remove the filter from the enclosure by gently squeezing the filter in the centre and pulling it.
- Examine the filter for cleanliness and damage.
- Wash the grey foam filter in warm water with a mild detergent. Rinse thoroughly to remove all detergent residue.
- Allow the filter to air dry completely before reinstalling it. If the foam filter is torn or damaged, replace it.
- Reinstall the filters.
- If the filter is damaged, replace it with a new one from the Chest Unit.

Caution: Never install a wet filter into the device. You must ensure sufficient drying time for the cleaned filter.

Important: Do not let the filter get blocked with dust because this will affect how well the A40 NIV works.

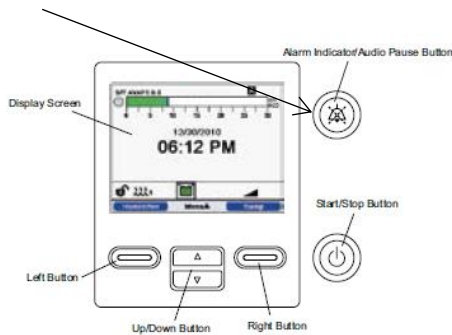
What do I do if I have problems with my mask?

Generally, it is ok to have small leaks. You can make some small changes to stop big leaks.

- If your mask leaks, pull the mask cushion directly away from your face and set it gently back into place. This allows the cushion to create a new seal on your face.
- If you have leaks around your eyes, adjust the side straps.
- If you have leaks around your lips or chin, adjust the lower straps.
- If you can feel too much pressure on the bridge of your nose, loosen the side straps.
- If you get a sore on the bridge of your nose, please contact the Chest Unit for advice.

What do I do if the alarm sounds?

The alarm may sound for a few reasons and a message will be displayed on the screen telling you what the fault is. To temporarily silence an alarm press the alarm indicator/audio pause button.



The alarm is silenced for 60 seconds and then sounds again if the cause of the alarm has not been corrected

1. Circuit Disconnect Alarm.

There may be a leak around your mask, a crack in the tubing or the tubing may have come away from the machine.

Try refitting your mask and making sure it is on securely. Check all tubing is connected and there are no holes/cracks in the tubing.

2. Pressure Regulation Alarm.

Check for blockages or excessive leaks. Check the filter, mask and tubing. If there are no visible problems then contact the chest unit as the device may have a fault and require changing.

3. Low Circuit Leak.

Check that the exhalation ports that you breathe out of in your mask are not blocked.

4. High Temperature.

Move A40 to cooler location. Make sure it is not close to a heat source.

5. Power Disconnect Alarm. The machine will stop operating and the screen will turn off. There will not be an error message on the machine. Remove your mask. Check your power connections. Make sure there is power at the outlet or power source.

If you are unable to solve why your A40 NIV is alarming, please contact the Chest Unit on the details below

Who can I contact with queries and concerns?

Before you go home, someone from the NIV team or Chest Unit will show you how to fit your mask and how to use your A40 NIV device.

If you have any problems with your machine at home, please contact the Respiratory Physiologists.

Chest Unit King's College Hospital

Tel: 020 3299 4743 option 3

Email: kch-tr.CPAPkings@nhs.net

Chest Unit Princess Royal Hospital.

Tel: 01689 863104

Your A40 NIV settings

Machine model -----

Serial number -----

IPAP (cmH₂O) -----

EPAP (cmH₂O) -----

Ti (secs) -----

Back up rate (bpm) -----

Mode -----

Rise time -----

Mask -----

Oxygen rate (L/min) -----

PALS

The Patient Advice and Liaison Service (PALS) is a service that offers support, information and assistance to patients, relatives and visitors. They can also provide help and advice if you have a concern or complaint that staff have not been able to resolve for you. They can also pass on praise or thanks to our teams.

PALS at King's College Hospital, Denmark Hill, London SE5 9RS

Tel: 020 3299 3601

Email: kch-tr.palsdh@nhs.net

PALS at Princess Royal University Hospital, Farnborough

Common, Orpington, Kent BR6 8ND

Tel: 01689 863252

Email: kch-tr.palspruh@nhs.net

If you would like the information in this leaflet in a different language or format, please contact our Communications and Interpreting telephone line on 020 3299 4826 or email kch-tr.accessibility@nhs.net