

Chronic obstructive pulmonary disease

Understanding NICE guidance – information for people with chronic obstructive pulmonary disease, their families and carers, and the public

Prepared for second consultation (draft 1)

The paragraphs are numbered for the purposes of consultation. The final version will not contain numbered paragraphs.

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About this information

1. This information describes the guidance that the National Institute for Clinical Excellence (called NICE for short) has issued to the NHS on the management of chronic obstructive pulmonary disease (which is usually to COPD) in adults in the community and in hospitals. It is based on 'Chronic obstructive pulmonary disease: management of adults with chronic obstructive pulmonary disease in primary and secondary care', which is a clinical guideline produced by NICE for doctors, nurses and others working in the NHS in England and Wales. Although this information has been written chiefly for people with COPD, it may also be useful for family members, those who care for people with COPD and anyone interested in COPD or in healthcare in general.

Clinical guidelines

2. Clinical guidelines are recommendations for good practice. The recommendations in NICE guidelines are prepared by groups of health workers, lay representatives with experience or knowledge of the condition being discussed, and scientists. The groups look at the evidence available on the best way of treating or managing a condition and make recommendations based on this evidence.
3. There is more about NICE and the way that the NICE guidelines are developed on the NICE website (www.nice.org.uk). You can download the booklet *The guideline development process – information for the public and the NHS* from the website, or you can order a copy by phoning the NHS Response Line on 0870 1555 455 (quote reference number N0038).

What the recommendations cover

4. NICE clinical guidelines can look at different areas of diagnosis, treatment, care, self-help or a combination of these. The areas that a

guideline covers depend on the topic. They are laid out at the start of the development of the guideline in a document called the scope.

5. The recommendations in 'Chronic obstructive pulmonary disease: management of adults with chronic obstructive pulmonary disease in primary and secondary care', which are also described here, cover the full range of care that should be available from the NHS to adults with COPD. They include how the diagnosis should be made and the treatments that should be offered at different times.
6. The information that follows tells you about the NICE guideline on COPD. It doesn't attempt to explain it or the treatments in detail. NHS Direct is a starting point to find out more and has some information on some of the medical conditions that may be involved, such as bronchitis. Phone NHS Direct on 0845 4647 or visit the website at www.nhsdirect.nhs.uk.
7. If you have questions about the specific treatments and options covered, talk to your doctor or nurse (or another health professional, depending on what it is you want to know).

How guidelines are used in the NHS

8. In general, health workers in the NHS are expected to follow NICE's clinical guidelines. But there will be times when the recommendations won't be suitable for someone because of his or her specific medical condition, general health, wishes or a combination of these. If you think that the treatment or care you receive does not match the treatment or care described in the pages that follow, you should talk to your doctor or nurse.

If you want to read the other versions of this guideline

9. **[The following information will apply once the final guideline has been issued]** There are three versions of this guideline:
 - this one

- the NICE guideline, 'Chronic obstructive pulmonary disease: management of adults with chronic obstructive pulmonary disease in primary and secondary care', which has been issued to people working in the NHS
- the full guideline, which contains all the details of the guideline recommendations, how they were developed and information about the evidence on which they were based.

10. All versions of the guideline are available from the NICE website (www.nice.org.uk). This version and the NICE guideline are also available from the NHS Response Line – phone 0870 1555 455 and give the reference number(s) of the booklets you want (N0xxx for this version, N0xxx for this version in English and Welsh, and N0xxx for the NICE guideline).

Key messages for you and for health professionals

11. The guideline that NICE has issued to the NHS contains many specific recommendations about the sort of care a person with COPD should receive in the NHS and these are covered on the following pages. Some of the recommendations in the guideline are known as 'key recommendations'. They are particularly important and should be put in place as a priority.

Key recommendations

12. *Diagnosing COPD*

Your doctor should think about COPD as a possible diagnosis if you are over 35, have or do something that makes it more likely that you have COPD (for example, if you're a smoker), and go to see him or her because you:

- find that you are short of breath after going upstairs, exercising or some other type of exertion, **or**
- have a cough that has lasted a long time, **or**
- often cough up phlegm ('sputum') from your lungs, **or**
- get a lot of chestiness or wheezing during cold weather.

13. Your doctor should test how well your lungs are working using a piece of equipment called a spirometer. All doctors, nurses and other health professionals who treat people with COPD should have a spirometer available for this and should understand the results of the test.

14. *Stop smoking*

Giving up smoking is very important if you are a smoker with COPD. Your doctor or nurse should really encourage and help you to do this.

15. *Inhaler medicines*

Broadly speaking, some bronchodilators have a short-lasting effect

whilst others last for longer. They are sometimes called 'short-acting' and 'long-acting' medicines. They can help your symptoms such as breathing difficulties and may also improve your ability to exercise. If you are still having problems with your breathing despite using a short-acting inhaler medicine, you should be given a long-acting inhaler medicine to open up the airways (this type of medicine is known as a bronchodilator).

16. If your COPD is quite bad and there have been two or more times in a 12-month period when you've had to have antibiotics or steroids to help, you should also be given a steroid inhaler. (COPD that's 'quite bad' here means an FEV₁ of 50% predicted or lower, see page 9 for an explanation.) To find the best type of bronchodilator for you, you may have to try a couple out to see which gives you the most benefit with the least side effects.

17. *Pulmonary rehabilitation for all who need it*

Pulmonary rehabilitation aims to help people with COPD (and those with other long-term breathing problem) to have as normal a life as possible.

18. If you feel that your COPD is making you unable to do the things you would like to do, you should be offered a pulmonary rehabilitation programme that has been designed specifically for you. Appointments should be at a place and time that are convenient.

19. *Non-invasive ventilation*

Non-invasive ventilation (NIV for short) is a method of helping a person to breathe artificially. The person wears a mask that covers the nose (or less commonly, a full face mask that covers the nose and mouth). This is connected to a small machine that pushes air through the mask and into the person's lungs. NIV should be used for people who, when their COPD is particularly bad, cannot get enough oxygen into their blood and have too much carbon dioxide in it (the medical term is hypercapnic respiratory failure) and this happens despite treatment

with the right type of medicines.

20. If you have NIV, the system should be set up and monitored by a team of health professionals who are trained and experienced in using it. There should be a clear plan about what to do if you get worse.

21. *Manage exacerbations*

If your COPD gets particularly bad, it's known as an exacerbation. The number of exacerbations should be reduced by appropriate use of a steroid inhaler, bronchodilator and vaccinations (such as flu or another bacterial infection called pneumococcal infection). To try to reduce the seriousness of exacerbations of your COPD, your doctor or nurse should:

- advise you about what to do if there are early signs of an exacerbation
- start steroid tablets
- start antibiotics
- give you NIV if you need it
- use a hospital-at-home or assisted-discharge scheme if you need it (see page 28 for an explanation)

22. *Having access to a team of experts*

You should be able to get in touch with a team of health professionals who are responsible for making sure you have the right treatment and care

Chronic obstructive pulmonary disease (COPD)

23. Chronic obstructive pulmonary disease (which is shortened to COPD) is a general name used to describe conditions where people cannot breathe out properly because of long-term, irreversible damage to the body's breathing system. In COPD, the airways have become blocked

(‘obstructed’) to some extent, and the lungs themselves may have become damaged. (The airways are the passages through which the gases oxygen and carbon dioxide flow into and out of the body.) Causes of the blockage include an increased amount of mucus in the airways and narrowing of the passages as a result of the airway walls becoming thickened. Emphysema, where the lung tissue becomes damaged and the person cannot generate enough force to breathe out properly, is another condition that can result in COPD.

24. The changes usually start with inflammation in the airways, which is the body’s response to a harmful substance, such as cigarette smoke, being breathed in over a period of time. If the inflammation lasts for a while, permanent changes start to take place.
25. Although treatments for COPD can help a person to breathe more easily, they can’t repair the damage.

FEV₁ and FVC

26. FEV stands for ‘forced expiratory volume’. The FEV₁ is the maximum amount of air that a person can force out of their lungs in a second. If a person has COPD, the FEV₁ is lower than would be predicted from their age, sex and other characteristics.
27. FVC is short for ‘forced vital capacity’. This is the total amount of air that a person can force out of their lungs.
28. FEV₁ and FVC are important measurements for a person with COPD as they show how much their lungs have become affected. A person is said to have an obstructed airflow (as happens in COPD) if their FEV₁ is lower than 80% of what would be expected, and their FEV₁ divided by their FVC is below 0.7.
29. FEV and FVC are measured using a spirometer.

Spotting COPD early

30. In order to try to catch COPD early, doctors and nurses working in GP practices or community clinics should use a spirometer to check people who:

- are over 35, **and**
- are current or ex smokers, **and**
- have had a cough for a long time.

31. This type of check should also be considered for people who have long-term bronchitis (inflammation of the airways).

32. A spirometer is a piece of equipment used to measure how well the lungs are working.

Diagnosing COPD

33. Your doctor should think about COPD as a possible diagnosis if you are over 35, have or do something that makes it more likely that you have COPD (for example, if you're a smoker), and go to see him or her because you:

- find that you are short of breath after going upstairs, exercising or some other type of exertion, **or**
- have a cough that has lasted a long time, **or**
- often cough up sputum from your lungs, **or**
- get a lot of chestiness or wheezing during cold weather.

If COPD is a possibility, you should be asked if:

- you've lost weight recently
- you find it hard to put effort into any physical activity
- you've coughed up any blood
- you've been waking up at night

- you've been getting swollen ankles and or chest pains
- you're feeling particularly tired.

34. Your doctor should also ask you what makes you short of breath (breathless) and how it affects your daily life so they can grade you on a scale of breathlessness.

Checking how well your lungs work

35. When trying to reach a diagnosis, your doctor should check how well your lungs are working using a piece of equipment called a spirometer. All doctors, nurses and other health professionals who treat people with COPD should have the right equipment for this, should have up-to-date training to do it and should understand the results of the test.

Other tests at diagnosis

36. Your doctor should arrange for you to have a chest X-ray to rule out any other causes of your symptoms. A blood test (a 'full blood count') will show if you have an infection. Your body mass index (BMI) should also be calculated (this shows your body weight in relation to your height).

Additional tests that may be needed

37. Other tests may be needed in certain circumstances. The results of these tests will help the doctor to plan your treatment.

- **More breathing tests** ('serial peak flow measurements') if your doctor is still not sure whether it's asthma or COPD.
- **A test for alpha-1 antitrypsin** if you're young to have the symptoms of COPD (under 40), you've not smoked or hardly smoked, or if other members of your family have been alpha-1 antitrypsin deficient. Alpha-1 antitrypsin is an enzyme that helps to break down proteins. It's not exactly clear why, but people lacking this enzyme can get COPD. If you're found

to have alpha-1 antitrypsin deficiency, you should be offered the chance to go to a centre that has staff who have specialised in care of people with the condition so you can talk about the care and support that are available.

- **T_LCO** (transfer factor for carbon monoxide) test if your symptoms seem worse than they should be given the results from your spirometer tests. Transfer factor for carbon monoxide is a way of assessing the lungs ability to transfer oxygen to the blood stream.
- **A CT scan** of your chest if your symptoms seem worse than they should be given your spirometry results, or if something has shown up on your chest X-ray or if you might need to have surgery. (CT stands for computed tomography, which is a way of viewing the body tissues.)
- **An ECG (heart trace), an echocardiogram** (which uses ultrasound) or both, to check your heart for signs that it may have been affected by the COPD.
- **Pulse oximetry** if your breathing is very poor or if there are signs that your heart has been affected. This is to see whether you need to have some extra oxygen. A pulse oximeter senses how much oxygen there is in your blood.
- **Sputum test** if you produce a lot of sputum with pus in it, to check for signs of infection.

Reversibility testing

38. With reversibility testing, the doctor gives the patient a medicine to see whether it can improve the functioning of the lungs. This type of testing is sometimes useful if there are two different medical conditions (such as COPD and asthma) that have similar symptoms but which respond differently to medicines. In general, though, doctors should be able to tell whether people have COPD without needing to use reversibility testing.

39. If you have had all the other tests (see page 11) and your doctor is still not sure whether you have asthma, COPD or both, reversibility testing

may be tried with bronchodilator inhalers, steroid tablets or both. If the condition itself starts to get better with these treatments, it's more likely that asthma accounts for your symptoms.

40. If doubt remains, you should be referred for further tests (see page 11).

Finding out how severely you are affected

41. Your doctor should work out how bad your COPD is from the results of your tests, how much it affects your daily life, how often you get bad attacks and how healthy you are otherwise.

42. If your FEV₁ is between 50 and 80% of that predicted, you are said to have mild airflow obstruction. If it's between 30 and 50% of that predicted, it's said to be moderate airflow obstruction. And if it's below 30% of that predicted, the airflow obstruction is severe.

Once COPD has been diagnosed

43. Once you've been diagnosed as having COPD, your doctor or nurse should:

- highlight that you have COPD in your notes and include the results of your initial spirometer tests
- help you to try to stop smoking
- record the effects of any different medicines that you try for your COPD
- use a spirometer to check you from time to time, and put the results in your notes
- check that you're using your inhaler(s) properly from time to time
- keep a check on whether you need to see a specialist or other healthcare professional for help and advice.

People with mild or moderate COPD

44. If your COPD is mild or moderate, you should see someone for a check at least once a year.

People with severe COPD

45. If your COPD is severe but doesn't seem to be getting any worse because of the medicines you're on, you don't need to have regular hospital checks. But when you see your doctor or nurse, he or she should check how well your medicines for COPD are working. Attention should also be paid to whether you're depressed, eating properly, need help from other quarters, such as social services, and whether you need long-term oxygen.

46. There should also be arrangements in place so you can get a hospital check quickly if you need one.

47. If you have severe COPD and you're having specialist treatments such as non-invasive ventilation, you should have regular appointments with a hospital specialist.

Seeing a specialist

48. Sometimes it's necessary for a person with COPD to see a specialist – it may be so that you can get the best type of treatment for your particular circumstances. Or it might be because your doctor is not completely sure about the diagnosis. You may also see a hospital specialist if you've asked for a second opinion about your diagnosis.

49. If you're given a hospital appointment, you may not always see a doctor who has specialised in breathing problems. You may see another healthcare professional such as a nurse or a physiotherapist who has specialised in helping people with breathing difficulties.

Helping you to live as normal a life as possible

50. If your COPD is limiting what you can do, you should be offered a programme of pulmonary rehabilitation. This is a programme of care co-ordinated by different types of healthcare professional who work as a team to help you to live as normal a life as is possible and to be as self-sufficient as possible. The programme should be designed specifically for you, and the classes or appointments should be at a place or time that are convenient.

51. In order to get the most out of this type of help, you need to make the effort to work with your team and follow their advice.

Teaching you about COPD

52. Your team should teach you about your condition and how to help yourself. If you have moderate or severe COPD, you should be told about non-invasive ventilation (see page 24) and its benefits and limits.

If you are at risk of having a bad attack (an 'exacerbation')

53. If you are at risk of having an exacerbation, you should be given advice on what to do if you think one is starting (see page 28).

When your COPD is stable

54. Your COPD is said to be stable if your symptoms are more or less the same from day to day.

Stopping smoking

55. Giving up smoking is very important if you are a smoker with COPD. Your doctor or nurse should really encourage and help you to do this, whatever your age. He or she should ask you about how many cigarettes you smoke in a day and write this in your notes.

56. If you are having trouble stopping, your doctor or nurse should discuss trying one of the anti-smoking programmes that are now available (such as medicines or patches, with extra support to help you use them successfully), though there may be reasons why some options may not be suitable for you.

57. If you try to stop smoking but are unsuccessful, your doctor or nurse should not normally encourage you to have another go until you've waited for at least 6 months. This should give you time to rebuild your motivation to succeed. You may be encouraged to try again sooner if there are reasons why another attempt might be more successful.

Medicines

58. Broadly speaking, some bronchodilators have a short-lasting effect whilst others last for longer. They are sometimes called 'short-acting' and 'long-acting' medicines, and the following information uses these terms. ***[Text changed as in key recommendations box]***

Bronchodilator inhalers

59. In COPD, the airways can become narrowed because the muscle layers around the passages tighten ('contract'). Bronchodilators aim to reduce this narrowing effect by relaxing the muscle layers.

60. If the COPD is making you breathless and limiting what you do, you should be tried with a short-acting bronchodilator.

61. When your doctor or nurse comes to review how well this is working, he or she should look at:

- your results in spirometer tests
- how you've been on the inhaler
- what you've been able to do since you've had it compared with what you could do beforehand
- how quickly the inhaler eases your breathing.

62. If you're still having problems, you should also be given either a long-acting bronchodilator inhaler, or a combination of a short-acting anticholinergic medicine and a short-acting beta agonist.

Anticholinergic and beta-agonist medicines make the muscle layers around the airways relax by interfering with the signals that pass from the nerves to the muscles. You should be involved in the decision about which option to try – your doctor should also take into account the effects of medicines you've tried so far, the possible side effects and value for money in relation to how well the medicines work.

Theophylline

63. Theophylline is the general name for a particular type of bronchodilator. If there's too much of it in a person's body, or the person is also taking certain other types of medicines, it can cause problems. Because of this, you should be given theophylline only after you've tried short-acting and long-acting bronchodilator inhalers. You might also be tried on theophylline if you can't use inhalers. A person taking theophylline has to have regular blood tests.

64. If you try theophylline, your doctor or nurse should check:

- how you've been on it
- what you've been able to do since you've had it compared with what you could do beforehand
- your results in spirometer tests.

65. Because of the problems outlined above, doctors should be particularly cautious when using theophylline in older people, because their bodies deal with medicines at slower rates and they are also more likely to be taking other medicines. If you're given antibiotics known as macrolides or fluoroquinolones, your theophylline dose should be reduced. This should also be done if your doctor gives you any other medicine that can cause problems if taken at the same time as theophylline.

66. Theophylline belongs to a group of medicines called the 'methylxanthines'. The information above applies equally to other methylxanthines.

Steroids

Steroid inhalers

67. You should not be given a reversibility test using a steroid inhaler (see page 12).

68. If your COPD is quite bad and there have been two or more times in a 12-month period when you've had to have antibiotics or steroids to help, you should also be given a steroid inhaler. (COPD that's 'quite bad' here means an FEV₁ of 50% predicted or lower, see page 9 for an explanation.)

69. If you use a steroid inhaler, there's a risk of developing side effects such as osteoporosis. Your doctor should be aware of these risks and should watch out for side effects.

Steroid tablets

70. In general, you shouldn't be kept on steroid tablets for long periods. If you have severe COPD, though, and you were given the tablets to help during a particularly bad period, you might need to stay on them.

71. If you are given steroid tablets, you should be on as low a dose as possible. There is a risk of side effects, which include developing osteoporosis, with long-term steroids. If you're on steroid tablets for a long period you should be checked for signs of side effects including osteoporosis and given preventive treatment if you need it.

Medicines to help with sputum

72. Sputum is the medical name for the phlegm that's coughed up from the lungs. If you have this type of coughing (it's called a productive cough)

your doctor should think about trying what's known as a mucolytic medicine. If this is successful and lessens your coughing and the amount of sputum you're coughing up, you should stay on it.

73. On a different note, if you produce an excessive amount of sputum, a physiotherapist should show you how to use a special mask (see page 32) and how to breathe to try to reduce the effect of the sputum.

Medicines and supplements that should not be used

74. Some medicines and supplements should not be used in general because either they have been shown not to work in people with stable COPD or there isn't enough research to justify their use.

75. These are:

- cough medicines (called antitussive medicines)
- antibiotics given to try to prevent infection (rather than to fight an infection that you already have)
- alpha-tocopherol and beta-carotene supplements
- alpha-1 antitrypsin replacement treatment in people who are found to have alpha-1 antitrypsin deficiency.

Combining medicines

76. Certain combinations of medicines seem to be particularly helpful in COPD. How well a combination works should be monitored in the same way as for single medicines (for example, see page 16).

Inhalers and other devices

Inhalers

77. You should be prescribed an inhaler only after you've shown that you can use it properly. If you can't get the hang of a certain type, you should be able to try another sort.

78. From time to time, your doctor or nurse should check that you're still using your inhaler correctly. If necessary, you should be re-shown the correct way to do it.

79. Your doctor might need to adjust the dose of your medicine to suit the way you use your inhaler.

Spacers

80. A spacer device attaches to an inhaler. With a spacer, the user doesn't have to co-ordinate puffing and inhaling. If you need a spacer, you should be given the right type of spacer for your inhaler.

81. When you're using your spacer, you should operate the inhaler once and then inhale as quickly as possible. Repeat these steps as necessary. They work just as well if you breathe in and out as if you take single breaths.

82. Clean your spacer using washing-up liquid and let it dry naturally. Don't do this more than once a month, though, or too much static will build up and it won't work as well as it should. Before you use it, wipe the mouthpiece.

Nebulisers

83. A nebuliser is a device that converts a liquid containing the medicine into an aerosol that can be breathed in. In this way, higher doses of medicines can be taken.

84. Your doctor should think about trying a nebuliser if you're still very affected by breathlessness despite treatment. Before a nebuliser is prescribed, your doctor should think about whether you, your carer, or both of you would be able to use it. You should be able to choose whether you want a nebuliser with a facemask or a mouthpiece (though it has to be a mouthpiece for some types of medicine). If a nebuliser is prescribed, you should have access to a nebuliser service that provides

equipment, servicing, advice and support.. You should only use a nebuliser system advised by your healthcare professional.

85. Your Doctor will check to see if the nebuliser therapy reduces your breathlessness. If it does not the nebuliser therapy may not be continued.

Oxygen

86. Your doctor should check whether you need to have extra oxygen if:

- you have moderate or severe airflow obstruction (see page 13), **or**
- there is an increase in the number of your red blood cells ('polycythaemia'), **or**
- there is swelling in your limbs, **or**
- your skin has a bluish tinge because of a shortness in oxygen, **or**
- there's a raised blood pressure in the jugular vein, **or**
- the amount of oxygen in your blood is low (below 92% saturation), **or**
- you have high blood pressure in the blood vessels around the lungs.

87. To see whether you need extra oxygen, the amount of oxygen and other gases should be measured in your blood. This should be done on two occasions that are at least 3 weeks apart. If the results show that you're not able to breathe in enough oxygen normally (see box), you should be given extra oxygen.

88. If you have a fixed supply of oxygen at home, you should be given an oxygen concentrator. This is a machine that purifies oxygen from room air and provides a continuous supply. It plugs into the electric supply with tubing fixed around the skirting and pipes that take oxygen into rooms that you use.

When extra oxygen should be given

89. A person's PaO₂ is a sign of how much oxygen is being transferred from the lungs to the blood.

90. A PaO₂ below 7.3 kPa means extra oxygen is needed to boost the amount the person can breathe in.

91. Extra oxygen is also needed for a person with a PaO₂ between 7.3 kPa and 8 kPa if he or she has an increase in the number of red blood cells because of the problem with oxygen (the medical name is secondary polycythaemia), or becomes low in oxygen at night, or has swelling in the limbs, or has high blood pressure in the blood vessels around the lungs.

92. To get the benefits of oxygen treatment, you should breathe it for at least 15 hours a day.

Ambulatory oxygen

93. Ambulatory oxygen is when you use an oxygen supply that you can move around with. It should be prescribed for you if you are already having oxygen therapy and you want to continue having oxygen when you're away from home. It should also be considered if your blood oxygen drops when you do an activity, it's shown that oxygen helps you do activities and/or helps with breathlessness, and you're motivated to use it. In general, it shouldn't be given if a person has a PaO₂ above 7.3 kPa and the blood oxygen doesn't drop during an activity.

94. Before you are prescribed this type of oxygen therapy, you should have an assessment by a hospital specialist.

95. Appropriate equipment should be available if you have ambulatory oxygen (see box).

How long you use it for	Best type of equipment
Less than 90 minutes	Small cylinder
90 minutes to 4 hours	Small cylinder with oxygen conserving device
More than 4 hours	Liquid oxygen
More than 30 minutes, with flow rates greater than 2 litres/minute	Liquid oxygen

Treatment with short bursts of oxygen

96. Treatment with short bursts of oxygen (using cylinders) is an option only when other treatments have failed to help severe breathlessness. And if you try it, you should carry on with it only if the breathlessness improves.

Non-invasive ventilation (NIV for short)

97. Non-invasive ventilation (NIV for short) is a method of helping a person to breathe artificially. The person wears a mask that covers the nose (or less commonly, a full face mask that covers the nose and mouth). This is connected to a small machine that pushes air through the mask and into the person's lungs.

98. If you have a long-term problem getting enough oxygen into your blood and have too much carbon dioxide in it, and you have needed help with breathing (ventilation) in the past, you should be referred to a specialist centre to see whether you need NIV. Similarly, if having long-term oxygen treatment is causing problems, you should be referred for a discussion about NIV.

Guarding against chest infections

Vaccinations

99. You should be offered a vaccination against pneumococcal infection (this bacterial infection can cause pneumonia and other illnesses). You should also be offered an annual flu jab.

Medicines to fight flu

100. If you have the start of what seems like flu, you should see your doctor as soon as possible. You may be able to have a medicine with the general name of zanamivir or oseltamivir to help stop the flu from getting a grip. If you are prescribed zanamivir, your doctor should discuss the possibility that it might make your airways go into a spasm. You should keep a fast-acting bronchodilator inhaler close by while you're taking a course of zanamivir.

Cor pulmonale

101. Cor pulmonale is heart disease that happens as a consequence of a lung condition such as COPD. If there are signs of a heart problem, such as swelling of the limbs, then cor pulmonale should be considered as a diagnosis. When it's being diagnosed, the doctor should aim to exclude other possible causes of the swelling in your arms and legs.
102. If you have cor pulmonale, your doctor should check whether you need long-term oxygen therapy. The swelling can usually be controlled using a diuretic (water tablet).
103. Some types of medicine are not generally recommended for cor pulmonale in people with COPD. These are ACE inhibitors, calcium-channel blockers, alpha-blockers, and digoxin

Lung surgery

104. Some people with very specific conditions may be able to have an operation on their lungs.
105. A person who is breathless with an FEV₁ of less than 50% of that predicted and has a large blister-like area in the chest (called a 'bullae') should be referred to a specialist to discuss the possibility of an operation to remove the bullae. There also have to be some signs that the lung has not become too damaged before the operation can be considered.
106. An operation may also be possible for a person with emphysema that's mainly affecting the upper part of the lung and who is breathless despite using medicines and having rehabilitation. He or she should be referred to a specialist to discuss the possibility of an operation to remove part of the lung if there are signs that this type of operation would actually help the lungs to work more easily. These signs are:

- an FEV₁ above 20% of that predicted
- a low amount of carbon dioxide in the blood around the lungs (this shows that the lungs aren't working efficiently)
- a T_LCO above 20% of that predicted (see page 11).

107. A lung transplant may be an option for someone who is still breathless despite the medicines, but this depends on the person's individual condition and general health and on the local arrangements for carrying out this type of operation.

Spotting and helping with anxiety and depression

108. Having a long-term illness such as COPD can sometimes make a person depressed or cause anxiety. Healthcare professionals who deal with people with COPD should watch out for signs of this. And if a person with COPD is found to be depressed or anxious, he or she should be treated as someone without COPD would be – that is, with medicines and support.

Dietary checks

109. Your BMI should have been checked at diagnosis. If it's found to be high or low or is very changeable you should see a dietitian who can advise you about your diet.

110. If your BMI is low, you should be given dietary supplements and encouraged to exercise to help build yourself up.

Doing normal activities

111. Your doctor or nurse should ask you about how easy you find it to do your normal day-to-day activities and how breathless you become when you are doing them. They should check whether you need some extra help (such as specially adapted equipment or being taught techniques to make tasks easier).

Special considerations

Air travel

112. If you're having long-term oxygen treatment and want to fly somewhere, your doctor or nurse should check whether it would be OK against a set of recommendations produced by a professional body called the British Thoracic Society. The same applies for people who have an FEV₁ under 50% of that predicted.

113. If your COPD is caused by a bulla in your chest, your doctor or nurse should discuss the possible risk of pneumothorax during a flight. A pneumothorax is where air escapes into the chest from the lung and presses against it, making it more difficult to breathe.

Scuba diving

114. Scuba diving isn't recommended for people with COPD.

Having a general operation

115. The decision about whether or not you are fit enough to have an operation should be taken by your consultant anaesthetist and consultant surgeon. It will depend on a number of things, including your condition, your general health and how much you need the operation. If there's time before an operation, your doctor should make sure that your COPD is being treated as well as possible.

Treatment for bad attacks

116. Some people with COPD find that they have attacks when their symptoms become particularly bad. These are called 'exacerbations'. The person may become much more breathless, may start to have a cough, may notice that more sputum is being produced or may notice that the sputum that's coughed up is a different colour than normal.

Helping yourself

117. If you and your doctor or nurse think that an exacerbation is a possibility, you should be given advice about what to do at the first sign that one might be on its way. This should include advice about:

- starting steroid tablets if you notice that you're becoming more breathless and it's interfering with your normal activities (as long as it's OK for you to take steroid tablets, you should be given some to keep at home)
- starting antibiotics if you notice that there is pus in your sputum (again, you should be given some of these to keep at home)
- making changes to your bronchodilator medicine to help with your symptoms.

118. You should also be advised to contact your doctor or nurse if things don't improve.

Deciding whether you need hospital treatment

119. Most people can be treated at home if they have an exacerbation, but some will need to go into hospital. The decision about whether person should go into hospital depends on factors such as the severity of the exacerbation and the person's COPD, the person's general health, and how well he or she would be able to cope at home.

120. Sometimes someone who would otherwise have to go into hospital can be treated at home. The schemes that support this are called 'hospital-at-home' or 'assisted-discharge' schemes, and they involve healthcare professionals who have experience in helping people with COPD. Doctors need to look at a person's individual circumstances and preference and the local arrangements and resources when making a decision.

Tests

If you're staying at home

121. If you are being treated at home, but your exacerbation seems quite bad, your doctor or nurse may check the level of oxygen in your blood using a pulse oximeter (see page 12). In general, it's not always necessary to send away a sample of sputum for tests.

If you go into hospital

122. If you go into hospital because of an exacerbation, you should:

- have a chest X-ray
- have your oxygen and other blood gases checked
- have an ECG to check your heart (to see whether there are any other reasons for your symptoms)
- have a blood test
- have a sputum sample tested if there's pus in the sputum.

123. If you have oxygen, the concentration that you are given should be put in your notes. If you have been taking theophylline, the amount of it in your body should be checked before on admission to hospital.

Treatment

124. An increase in breathlessness is common during an exacerbation. Usually, the treatment is to increase the dose of short-acting bronchodilators that a person is taking. These might be given using a nebuliser if, for example, a high dose is needed or you are likely to find it difficult to use an inhaler (see page 20). If you use a nebuliser in hospital, you should be changed on to an inhaler as soon as things are improving as this may mean you can leave hospital more quickly.

125. With a nebuliser, the doctor needs to take care to prescribe a type that won't make your condition worse. If you need to have oxygen at the same time, it should be given through your nose.

Steroids

126. As long as there are no strong reasons why you shouldn't have them, you should be given steroid tablets when you go into hospital with an exacerbation of your COPD.

127. If you haven't gone into hospital but your breathlessness has increased so that it's interfering with your normal activities, you should tell your doctor as soon as possible. He or she should think about giving you steroid tablets (as long as there are no major reasons why you shouldn't have them).

128. The course of steroids should last for up to 2 weeks. You should be told about the effects of taking repeated courses of steroids, and you should also be advised why, when and how to stop taking them.

129. If you have repeated courses of steroid tablets because you get a lot of exacerbations, your doctor should think about giving you preventive treatment for osteoporosis. Osteoporosis can be a side effect of using steroids.

Antibiotics

130. If you've had pus in your sputum during this or a previous exacerbation, you should be given antibiotics (the pus is a sign of infection). Otherwise, you shouldn't have antibiotics unless your chest X-ray shows signs of infection or you show signs of having pneumonia.

Theophylline

131. If you aren't showing improvement to a bronchodilator from a nebuliser, your doctor might try you on theophylline delivered directly

into a vein. If this happens, your theophylline level should be checked within 24 hours of starting on it.

Doxapram

132. Doxapram is a medicine that can help to stimulate breathing. It should be used only when non-invasive ventilation is not available or is not suitable for an individual. Doxapram is often used when the person isn't breathing well enough to get enough oxygen into the blood (this is called 'respiratory failure').

Oxygen

133. All the healthcare professionals (including paramedics) who treat people with exacerbations of COPD should have a pulse oximeter available to them. This piece of equipment senses how much oxygen there is in a person's blood. (Pulse oximeters should also be available to all healthcare professionals who are treating people with oxygen.)

134. During an exacerbation, the amount of oxygen in the blood (more accurately, the degree to which the blood in the arteries is saturated with oxygen) should be kept above 90% using extra oxygen if necessary. If your oxygen saturation is not known, you should be given extra oxygen if you are breathless during an exacerbation.

135. Once you are in a position to have your blood gases measured (for example, when you reach hospital), this should be done and the mix of gases that you've been breathing should be noted. This test should be repeated regularly to see the effects of treatment.

Non-invasive ventilation

136. Non-invasive ventilation (NIV for short) should be used for people who, during an exacerbation, cannot get enough oxygen into their blood and have too much carbon dioxide in it (the medical term is

hypercapnic respiratory failure) and this happens despite treatment with the right type of medicines.

137. If you have NIV, it should be given to you in a place specially set up for NIV and by staff who are trained and experienced in using it. There should be a clear plan about what to do if you get worse.

Intensive care and ventilation

138. If you become very poorly during an exacerbation, you should be treated in an intensive care unit. It may also be necessary to connect you to a ventilator to let it do the breathing for you. The decision about when to do this depends on a number of things, such as your FEV₁, your BMI, whether you need oxygen when you're stable and the presence of any other medical conditions.

Clearing sputum

139. If you have a problem clearing sputum, a physiotherapist may be able to help you using a mask that helps to suck the sputum away (this is called PEP, which comes from the medical term 'expiration under positive pressure').

Recovery

140. Your recovery from an exacerbation should be monitored by medical staff who should check your symptoms and watch your breathing regularly. If you had respiratory failure (when your lungs weren't working well enough to get enough oxygen into your blood), then depending on what happened, your blood gases should either be monitored using a pulse oximeter (see page 11) or by testing samples of blood in a machine.

Before you go home from hospital

141. Before you go home, your lungs should be checked using a spirometer, and you should be back on the best dose of bronchodilator for you.
142. If you had respiratory failure during the exacerbation, then your blood gas results should be satisfactory before you are allowed to go home.
143. Before you go home, you and your family should be clear about what you need to do and know any special instructions for taking the medicines you are on. Arrangements should be made about check-ups and any extra help you might need at home before you leave hospital. If you, your family or your doctor have any concerns that you might not be able to manage once you leave hospital, you might have a formal assessment of your everyday routine.

Palliative care

144. If a person's COPD is at such an advanced stage that other types of treatment can't give any further benefit, the person should have an opiate-based medicine to help relieve the breathlessness and make him or her more comfortable. Antidepressants, tranquillisers and oxygen should also be used if they might also help with this.
145. At this stage, a person and their family or carers should see health professionals and others who specialise in relieving pain and discomfort (they are known as the 'palliative care team'). And they should have access to the full range of services offered by these teams, such as admission to hospices.

Where you can find more information

146. If you need further information about any aspects of COPD or the care that you are receiving, please ask your doctor, nurse or other

health professional. You can discuss this information with them if you wish, especially if you aren't sure about anything. They will be able to explain things to you. NHS Direct may also be helpful – phone 0845 4647 or visit the NHS Direct website at www.nhsdirect.nhs.uk.

147. For further information about the National Institute for Clinical Excellence (NICE), the Clinical Guidelines Programme or other versions of this guideline (including the sources of evidence used to inform the recommendations for care), you can visit the NICE website at www.nice.org.uk. At the NICE website you can also find information for the public about other guidance in the following areas. These can also be ordered from the NHS Response Line (phone 0870 1555 455):

- the use of nicotine replacement therapy (NRT) and bupropion for smoking cessation, reference numbers N0084 (English) and N0085 (English and Welsh) (based on NICE Technology Appraisal Guidance No. 39)
- the use of zanamivir, oseltamivir and amantadine for the treatment of influenza, N0200 (English) and N0201 (English and Welsh) (based on NICE Technology Appraisal Guidance No. 58).

