

PHYSIOTHERAPY TREATMENT

For babies and toddlers with Cystic Fibrosis

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This factsheet has been written to assist you and your medical advisers. It is not intended to replace any advice you may receive from your Specialist CF Centre or CF Clinic.

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Contents

Introduction	2
How the lungs work.....	2
How CF can affect the lungs.....	2
Keeping the lungs clear	3
Do all babies with CF need chest physiotherapy?.....	3
When & how often will chest physiotherapy be needed?	4
What kind of chest physiotherapy is given to a baby?	4
• Postural drainage	4
• Percussion	5
• Other airways clearance techniques.....	6
Physical activity	6
Physiotherapy treatment in toddlers.....	6
• Chest physiotherapy	7
• Physical activity	7
Further information.....	8

Introduction

Looking after the chest and keeping the lungs clear is an extremely important part of the care of Cystic Fibrosis (CF). One aspect of chest care is chest physiotherapy, which helps to clear excess mucus from the lungs. Other treatments include antibiotics, inhaled medications and exercise.

This fact sheet is an introduction to chest physiotherapy and its use in babies and toddlers with Cystic Fibrosis.

How the lungs work

- The purpose of the lungs is to transfer oxygen from air we breathe into our blood. Our blood then transports the oxygen to the tissues and organs of our bodies, which need oxygen to function.
- The lungs start at the back of the throat with the wind pipe (trachea), which then branches off into two smaller airways (tubes), one going in to each lung.
- In each lung, the airways branch in a tree-like manner and get smaller in diameter. Eventually, they form small air sacs called alveoli at the edge of the chest.
- Intertwined with the smallest airways and air sacs are lots of tiny blood vessels called capillaries. Oxygen from the air we breathe in is transferred from the air sacs into the blood in the capillaries. At the same time waste gases are transferred from the blood into the airways and expelled as we breathe out.
- The lining of the airways continually produce mucus, to keep the airways moist and to trap dust and debris that may enter the lungs. The airways are also lined with microscopic hairs (cilia) which move the mucus up to the throat, allowing it to be cleared.

How CF can affect the lungs

- In CF the mucus produced by the lungs is stickier than normal, and CF lungs are more prone to infection. Infection in the lungs also leads to swelling of the airways and this makes the airway tubes narrower. The airways react to the swelling by producing more mucus.

- All of these factors can make it harder for patients with Cystic Fibrosis to clear mucus from their lungs. Repeated infections cause irreversible damage to the lung tissue.

Keeping the lungs clear

One of the ways we can help to keep the lungs clear when there are lots of secretions (i.e. when the lungs produce a lot of mucus) is with chest physiotherapy. Chest physiotherapy uses airway clearance techniques to help move and clear the excess secretions in the lungs.

Do all babies with CF need chest physiotherapy?

There have been many advances in the care of Cystic Fibrosis over the past few decades. Until relatively recently, most babies who were diagnosed with CF had significant problems with their chest and with their weight. Due to improvements in medical care over the past two decades and earlier diagnosis (in particular screening all newborns for CF), many babies diagnosed with Cystic Fibrosis nowadays appear relatively well and do not have obvious signs of chest infections or problems gaining weight. However there are still some babies who do have chest problems from the beginning.

We know that CF-related changes begin in the lungs from a very early stage, so it is therefore very important that all babies with Cystic Fibrosis are monitored very closely and treatment given early. All babies must be seen regularly by their CF team, including the physiotherapist. If your baby is very well and has very little in the way of chest problems it may not be necessary to give chest physiotherapy every day. However it is very important that you are taught how to assess your baby's chest and familiarise yourself with the airway clearance techniques so that you can use them whenever it is necessary.

When and how often will chest physiotherapy be needed?

As soon as a diagnosis of Cystic Fibrosis is made, parents/carers are always taught how to give chest physiotherapy.

The physiotherapist will carefully assess your baby and following this will decide whether or not it is necessary to give routine treatment on a daily basis, even if the baby's chest is clear. They may suggest that treatment is not needed every day but is given when the baby has a cold or is coughing. Babies are all individual and their condition may vary from day to day – parents soon become familiar with recognising chest symptoms and knowing when to give treatment.

There are several techniques that can be used and the specialist physiotherapist at your CF Centre will assess each baby individually and decide which treatment is most appropriate, when it should be given and how often.

What kind of chest physiotherapy is given to a baby?

There are several different airway clearance techniques, but only some of them can be used in babies. This is because babies cannot cough or do breathing exercises to command, and so treatment has to be given to them. The most common chest clearance treatment used for babies in the UK is modified postural drainage and percussion, although other techniques can be used. The CF Clinic will teach you how to give your baby chest physiotherapy and the technique to use.

Postural drainage and percussion

Postural drainage

- Gravity assisted positioning, often called postural drainage (PD), uses different body positions to help the drainage of secretions from particular areas of the lungs. It also helps to increase the airflow to different parts of the lungs.

- In babies, routine treatment consists of about five minutes in each postural drainage position twice a day. For babies who have no signs of chest problems, if this treatment is needed, one or two sessions each day may be advised. The total treatment time for each session is usually about 15 minutes (and usually consists of three or four positions for a few minutes each), but if lung infection is present, more frequent and longer spells of treatment may be suggested.
- Treatment should always be given before a feed. Treating a baby immediately after a feed may lead to reflux (regurgitation) of feed and the baby being sick.
- The easiest way to give treatment is normally with your baby lying on a pillow on your lap, but it is important to make sure that your baby's head is fully supported.
- Traditionally, the postural drainage positions in babies involved positioning the baby with the head slightly lower than the hips (a 'head down tip') in order to help secretions to drain. There is some concern that using a head down tipped position might increase the reflux of food from the stomach (particularly in babies). In view of this, and also because many babies with CF have few or no mucus secretions, most CF Centres have modified the use of PD in babies and they are treated lying flat.
- Occasionally it may be necessary to use a head down tip for physiotherapy, but if this is the case the specialist physiotherapist will teach you which positions to use.

Percussion

- This technique is also known as chest clapping, and is used to help loosen secretions. In babies it is usually combined with postural drainage positions.
- To perform percussion a cupped hand is used to clap the chest firmly and rhythmically, over a layer of clothing or a towel. Sometimes a soft face mask may be provided for you to use to clap the chest instead of your hand.
- Many babies quite enjoy having percussion and it is not painful or uncomfortable. If the baby cries during treatment, it is not necessary to stop unless the baby is distressed. Crying is quite an effective way of expanding the lungs.

Other airway clearance techniques

There are several other airway clearance techniques, some of which can be used in babies. These include:

Positive Expiratory Pressure (PEP) Mask

- This technique uses a soft face mask which is placed on the baby's face and gives a small amount of back pressure to the lungs when the baby breathes out. This helps to open up the airways and clear any mucus. If the physiotherapist feels this is the most appropriate treatment for your baby, you will be shown exactly how to give the treatment and clean the mask.

Assisted Autogenic Drainage

- This is an airway clearance technique that uses different levels of breathing to help clear mucus from the lungs. The physiotherapist will teach you exactly how to apply this technique if it is felt that it will help your baby.

Physical Activity

Physical activity, including exercise, is one of the most important aspects of the care of Cystic Fibrosis. It helps to keep the chest clear. It can also help to identify whether the chest is clear or not (this is because physical activity, laughing and games make the child breathe more deeply and if there is mucus in the lungs it can often be heard).

Although babies cannot exercise themselves, it is very important that physical activity is encouraged from the very beginning. General play activities such as bouncing (e.g. on a Swiss Ball or on your lap) and rolling on a mat can be started straight away, and, as the baby grows, more and more activities can be introduced.

Physiotherapy treatment in toddlers

Toddlers and young children can present quite a challenge in terms of giving treatment. They often do not just accept treatment, and may decide this is not something they want to do at all. However, with patience and imagination,

physiotherapy can become something that children accept and maybe even enjoy, particularly if it allows some “special” time with undivided attention from a parent.

It is important that when treatment is necessary, it is given. Even when difficulties arise it is important to persevere, as co-operation with treatment in future years may be influenced by how things are handled in the toddler years. It is essential that a child learns from an early age that physiotherapy is going to play a significant role in their life.

Chest physiotherapy in toddlers

The toddler stage is a stage of transition when the child begins to play a more active role in their treatment. At this stage it is usually no longer appropriate to treat the child on an adult’s lap, and a wider variety of treatment techniques are available once children reach the age of two–three years. The physiotherapist at your CF Centre will advise you on these. You can also refer to the CF Trust factsheet *Physiotherapy: Airway Clearance Techniques*.

Breathing exercises begin to play an important role in treatment at this age and children can learn to “huff”. Huffing is an important part of many of the airway clearance techniques and involves a forced breath out with an open mouth (as if blowing out to mist up a window pane). There are also various airway clearance devices that can be introduced for treatment and the physiotherapist at your clinic will give advice on this.

Physical activity in toddlers

Exercise plays a huge and very important role in treatment at this age, not just for the chest but also for bone health, muscle strength and posture. Children should be encouraged to take part in some sort of physical activity every day. Any exercise is beneficial, including general “rough and tumble”, trampolining, swimming etc. More details on exercise and CF can be found in the CF Trust factsheet *Exercise in Cystic Fibrosis*.

Further information

If you have any questions that have not been answered in this booklet, you can contact the Cystic Fibrosis Trust Support Service: 📞 **0845 859 1000**

For further general information and literature published by the Cystic Fibrosis Trust please contact:

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