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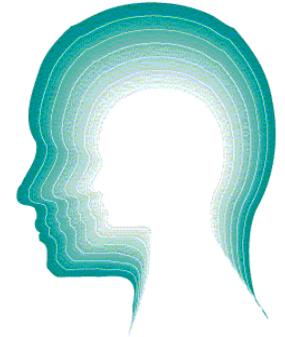
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# **Breathing Problems in Craniofacial Syndromes**

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**The Radcliffe Infirmary, Oxford and  
Great Ormond Street Hospital for Children**

## Are there any other problems?

In infancy, some children have difficulty in coordinating breathing and swallowing. This is particularly difficult if the nose passages are blocked and the child is relying on mouth breathing. This can make them slow feeders. Also if the nose is blocked and you cannot smell, then food does not taste so good and children may be less interested in eating. This can have a significant effect on growth

Chronically blocked airways often result in a permanently 'running' nose due to difficulties in dealing with the nasal secretion.

A few children have floppy lower airways. This may lead to a wheezing noise when they breathe out, and this also means they have more difficulties with chest infections.

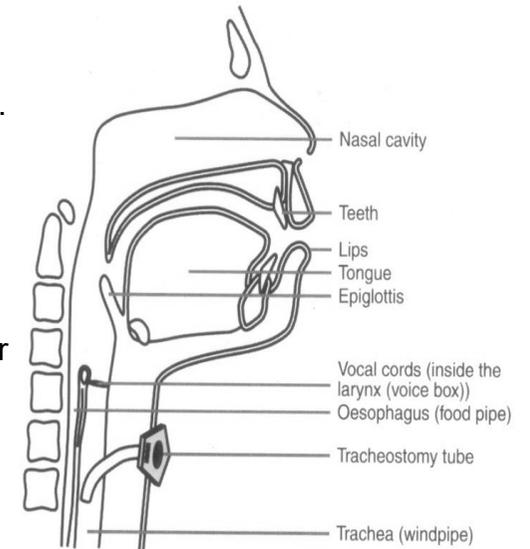
## Conclusions

Breathing problems are common in Craniofacial syndromes. The team at your Craniofacial Unit are aware of these problems and will discuss them with you. They will decide whether your child needs any treatment.

## Introduction

Breathing problems are common in craniofacial syndromes. Several of the syndromes, including Apert, Crouzon and Pfeiffer, have synostosis which limits anterior/posterior growth of the skull. This results in the mid-face (area from mouth to eyes) being poorly developed. As a consequence of this, the upper airways (from nose to back of throat) are narrow. A small proportion of children also have rather floppy lower airways (below the voice box and in the chest).

Many children breathe through their mouth, when awake, rather than their nose and have little problem. However, during sleep the muscles, which help to keep all our airways open, tend to relax and our airways become narrower. Many people snore as a result. This can become a particular problem during the phase of sleep called 'rapid eye movement' (REM) sleep, commonly known as 'dream' sleep, when our breathing muscles are in loose tone (relaxed). In some children with craniofacial abnormalities the airways become obstructed during dream sleep and, even though they carry on trying to breathe, no air gets in or out until they wake up or change position. This is called 'obstructive sleep apnoea' (OSA).



## How do I know if my child has OSA?

Most children with cranial synostosis snore during sleep. In OSA it is common for the snoring noise to decrease or stop, but if you look at your child you will see their chest and tummy moving in

and out. Then they may snort or move or briefly awaken and the snoring noise starts again. If this is happening lots of times in the night, it is likely that your child has OSA.

### **Does Obstructive Sleep Apnoea (OSA) matter?**

It is likely that many, if not all, children have mild episodes of OSA, particularly during colds, and this does not cause them any harm. However, if the obstruction is happening every night and is severe then it can cause several problems.

- The child is arousing from sleep many times during the night, disrupting a normal sleep pattern and this can result in sleepiness, grumpiness or poor concentration during the day.
- It can affect growth, as an important hormone (growth hormone) is released during sleep.
- With each episode of obstruction, the oxygen level in the blood falls and if this is frequent and severe it can eventually put a strain on the heart.

### **Can my child be tested for OSA?**

Yes, the test is a sleep study. This can take several forms, but all involve monitoring the oxygen level in the blood overnight, using a small gadget placed on the finger or toe. The breathing pattern is also monitored either with a video camera and microphone (to pick up snoring) or with flexible bands placed around the chest and tummy, or with a gadget on the face to pick up air flow with breathing. The signals from all these sensors are recorded overnight on a computer. They are then played back and analysed the next day. Sometimes the sleep studies can be done at home, but otherwise the child needs to sleep in the hospital overnight.

### **Does OSA get better or worse with age and growth?**

This varies from person to person. Often early on the mid-face grows less well than the rest of the head so that breathing obstruction becomes worse. Tonsils and adenoids also start to grow and even in children without craniosynostosis the area at the back of the throat is narrowest between the ages of two and

five years: then the airways start to get bigger again. It is important to recognise that things can change with time and sleep studies may need to be done more than once. They are a good non-invasive tool for monitoring changes in breathing patterns occurring as the child grows or as a result of treatment.

### **What can be done about OSA?**

The solution will differ from child to child, depending on their age and exact problem. Tonsils and adenoids may be removed to increase the airways. More commonly the solution is to provide a mask over the nose, which delivers a flow of air under pressure during sleep. This is called Continuous Positive Airways Pressure (CPAP). Such systems are available in sizes to fit from infants to adults. Obviously many small children find it strange to have to wear a mask to go to sleep, and it can take them some time to get used to it. Parents generally really notice a difference in their child, which makes this effort worthwhile. Older children tend to take to the mask more easily as they can feel the benefits the next day.

In a small number of children a CPAP mask is either not suitable or ineffective. Then it may be necessary to perform a tracheostomy to place a breathing tube directly into the main windpipe (trachea) which bypasses the upper airway. Once again this takes some getting used to, and parents need training on how to look after it, and how to change the tube. Again the difference in the child after a few weeks makes it all worthwhile.

Depending on the child's age and growth, the Craniofacial surgeon may consider the time is right to do an operation called a 'mid-face advancement'. Essentially this means that the mid-face is moved forwards to make room for the airways. If enough room can be created then there is no further need for CPAP or tracheostomy. However, this may need to be done more than once if it is attempted in very young children. Other needs such as protecting the eyes (by making the sockets bigger) may be satisfied at the same time.