Appendicitis in children – information for parents and carers

Introduction
This leaflet provides information on appendicitis in children including symptoms, diagnosis, treatment and discharge advice.

What and where is the appendix?
The appendix is located on the lower right side of the abdomen (above the hip bone) and is attached to part of the large bowel called the caecum. The appendix itself is a blind ended tube measuring between 2 and 20cm in length. The exact function of the appendix is not known although there is some limited research to suggest it may play a role in the body’s immune system.

What is appendicitis?
Appendicitis means inflammation of the appendix. Appendicitis occurs when the appendix becomes inflamed and infected. In many cases, an obstruction within the appendix causes the infection, resulting in bacterial overgrowth. In 20 to 30% of children, the appendix ruptures and releases the infection into the abdominal cavity. It is not known why some children get appendicitis and others do not.
Who gets appendicitis?
Appendicitis is a common condition. Around 40,000 people are admitted to hospital with appendicitis each year in England. It's estimated that around one in every 13 people will develop it at some point in their life.

Appendicitis can develop at any age, but it is most common in young people from 10 to 20 years old.

What are the symptoms of appendicitis?
Abdominal (tummy) pain is the main symptom. Pain often starts around the belly button and moves to the right side later. The pain often normally develops quickly, normally becoming worse over 6-24 hours and may worsen on movement. Other symptoms include:
- Feeling or being sick
- Loss of appetite
- Having a fever

In young children and infants the symptoms of appendicitis may be more vague for example, feeling generally unwell, being off food, having vague abdominal pain and perhaps vomiting and having loose stools.

How is appendicitis diagnosed?
Your child’s doctors will ask you lots of questions about your child’s symptoms, when different symptoms started and their severity. Your child will be examined during which it will be necessary for your child’s tummy to be looked at and gently pressed in different areas. The doctor may also ask your child to walk, hop or move in another way to help with the assessment.

Blood tests will be taken to help identify signs of infection although these alone cannot confirm appendicitis. Blood tests can also identify if a child who has been vomiting is dehydrated and what type of fluids (via a drip) they need to have.

Some patients will undergo an ultrasound of their abdomen. Ultrasound is not painful. Cold gel is placed onto a probe which is then passed over the child’s tummy in the same way that a probe is passed over a pregnant mother’s abdomen.

Appendicitis causes different symptoms in different people and no one test or finding is 100 per cent accurate in diagnosing appendicitis.
Because of this:

1. Other tests may be undertaken to rule out other problems (for example, a urine sample will be collected to look for urine infection and in teenage girls a urine test may be undertaken to exclude pregnancy).
2. Your child may be observed closely and re-assessed to see if other symptoms develop or increase in severity. During this period of observation your child may need to be partially or fully fasted (i.e. no drink or no food and drink) and so have intravenous fluids (via a ‘drip’).
3. In some cases the only way to diagnose appendicitis is to perform surgery.
   Unfortunately this can occasionally result in a normal appendix being removed.

**What is the treatment for appendicitis?**

Appendicitis is treated by removal of the infected appendix. In some cases, for example, when the appendix has caused an abscess, surgery to remove the appendix may be delayed until after the child has had a course of antibiotics.

The operation to remove the appendix is called an ‘appendectomy’ and may be performed as an open operation with a cut or as a laparoscopic (key-hole) procedure:

During laparoscopic appendectomy, small ‘keyholes’ (about 5mm long), are made in the abdominal (tummy) wall. Through these holes, special instruments are used to free up the appendix and remove it. This is all visualised on a television screen by a miniature camera, which is inserted through one of the key-holes. The exact position of the appendix varies between individuals and sometimes it is in a position which makes it impossible to be removed by the key-hole technique (for example, the appendix may be behind the caecum or very deep down in the pelvis) and so the surgeon will need to convert to open surgery instead.

The actual operation is the same when open surgery is used. The only difference is the way in which the surgeon gets to the appendix to remove it. A cut (5 to 10 cms long) is made over the lower right side of the abdomen through which to remove the appendix. Children who are very poorly at the time of surgery may require open surgery and those for whom laparoscopic surgery has not been possible.

**What preparation is needed?**

Once a decision has been made that your child needs to have an appendectomy:

- Your child will not be permitted to have any drink or food by mouth
- Your child will have intravenous fluids (a ‘drip’) to keep them hydrated
- Your child will receive antibiotics through the drip
- Your child will receive pain killers to keep them comfortable whilst waiting for the operation
- The person with parental responsibility (parent or legal guardian) will be asked to sign a consent form. The operation will be described to you in detail at this time and you are encouraged to ask any questions that you may have.
• Your child will be operated on as soon as possible. Unfortunately, due to other emergency patients your child may have to wait some hours for the operation to take place. You will be kept updated by your nurses and doctors.
• Where possible your child will be seen by one of our play specialists who will be able to help prepare your child with regard to what to expect and address any fears they may have.

What happens after the appendectomy?
You will be able to be with your child as soon as they begin to wake in the recovery room.

The plan for care after appendectomy depends on the severity of inflammation seen at the time of surgery and whether the appendix had already perforated (burst) or not. Your surgical team will update you on your child’s plan of care.

• All children will receive painkillers. Some children will be able to receive these by mouth but other children who need to stay ‘nil by mouth’ or who need stronger pain killers, will have their pain killers as suppositories or via the drip or both.
• Children will receive antibiotics. The duration that antibiotics are needed for will depend on the findings at the time of surgery. Some children will be able to have their antibiotics orally and some will need them through their drip. Some children will need to continue taking their antibiotics as medicine at home after discharge.
• Some children will be permitted to start drinking straight away and then build up to having foods. Other children will need to remain fasting and so have their fluids via a drip.
• Children who have been very poorly before surgery and who have been found to have severe appendicitis at surgery may need to have a nasogastric tube in place for a few days. This is a tube which is passed into the stomach via the nose and food pipe and allows the stomach to rest while the child recovers. Very unwell children may also need a urinary catheter to ensure their bladder empties of urine properly during recovery.

What are the risks of having appendicitis?
• Perforation, i.e. the appendix bursts. The average rate of perforation at presentation is between 16% and 30% but is higher in young children.
• **Appendix mass:**
  o An appendix mass occurs when the abdominal lining, called the ‘omentum’ and small bowel adhere (stick) to the appendix.
  o Usually the mass can be felt during the examination or will be seen on the ultrasound scan.
  o Children with an appendix mass are usually treated with fluids via a drip, painkillers and antibiotics and then, when the child has recovered from the appendix mass, the child is readmitted some weeks later for the appendix to be removed as a planned procedure. Delaying surgery in this way makes the operation more straightforward and so the child’s recovery is faster.

• **Appendix abscess**
  o Sometimes an abscess forms around a burst appendix. The abscess is a painful collection of pus which can collect as a result of the infection before surgery or as a complication of the surgery to remove the appendix.
  o Treatment is with antibiotics and, usually, drainage of the pus although sometimes the location of the abscess can make drainage difficult. When an abscess is found during surgery the area is carefully washed out and antibiotics given.

• **Abscesses in other locations within the abdomen**
  o Abscesses can form in the pelvis or under the diaphragm.

• **Paralytic ileus**
  o Normally the gastro-intestinal tract moves in waves (called ‘peristalsis’) to move food and fluid contents along. Sometimes there is a temporary loss of this intestinal movement known as ‘paralytic ileus’. During this time the child’s gut must be rested that is, the child will have a drip to receive their fluids through and not be permitted any fluid or drink. Children may also require a nasogastric tube (a tube which passes into the stomach via the nose and food pipe) to allow any stomach contents to drain out and prevent the child from vomiting.

• **Long-term complications: adhesions may cause intestinal obstruction but this is uncommon (see below).**
What are the complications from the appendectomy surgery itself?

Every operation and anaesthetic carries the risk of complications, although these are rare. Possible complications from appendectomy surgery include:

- Infection at the wound site – to minimise this, your child will be given antibiotics during the operation. After the operation, please inform the surgical team if you notice that the wound site appears red or inflamed (you can see your GP after discharge).
- Bleeding
- Adhesions – this is scar tissue formation which can occur after any abdominal operation. It is a small but lifelong risk, which may result in an obstruction (‘blockage’) of the intestine. Symptoms of an adhesion obstruction include cramping abdominal pain and green (bile) vomit. The risk of adhesions are minimised by using keyhole surgery.
- Bruising in one or more of the keyhole incision sites.
- Protrusion of tissue through the wound.
- Anaesthetic – every anaesthetic carries a risk of complications, but this is very small. Your child’s anaesthetists will meet you before the operation to assess your child and discuss risks with you. After an anaesthetic, some children have a sore throat and some feel sick, and occasionally vomit, but medicines can be given to help this.
- Pain – Your child will be given pain killers which may be by mouth, as a suppository or via the drip to keep them comfortable.

Chaperoning:

During your child’s hospital visits your child will need to be examined to help diagnose and to plan care. Examination may take place before, during and after treatment, is performed by trained members of staff and will always be explained to you beforehand. A chaperone is a separate member of staff who is present during the examination. The role of the chaperone is to provide practical assistance with the examination and to provide support to the child, family member/carer and to the person examining.
When will my child be discharged from hospital?

The length of hospital stay for a child who has had an appendectomy can range from two to seven days depending on severity of illness at the time of surgery and the child’s own recovery rate.

Your child will be discharged from hospital when they:
- Are not having any high temperatures
- Are tolerating eating and drinking
- Are comfortable and their pain is easily controlled
- Are able to mobilise
- When normal bowel function has returned

How should I care for my child at home?

Length of recovery at home will depend on the severity of illness whilst in hospital but in general:
- Your child should stay at home for one week
- Strenuous activities such as sport should be avoided for at least three weeks
- Your child should not have a bath for five days but a quick shower is acceptable

Please observe the wound for any signs of infection, this includes redness surrounding the area, discharge, warmth, and/or increase in pain. Contact your GP if you have any concerns.

Continue with pain relief as needed.

What follow up will my child need?

All children will be reviewed after discharge. Some children will be reviewed at the hospital but others can be reviewed by your GP. You will be advised at the time of discharge what follow up plan is advised for your child.

Who shall I contact if I have any queries, concerns or questions?

For further information/queries please contact:

Your nurse specialist (Mon to Fri 08:00 to 18:00hrs)...01223 586973.............
The ward you were on.................................................................
We are now a smoke-free site: smoking will not be allowed anywhere on the hospital site.
For advice and support in quitting, contact your GP or the free NHS stop smoking helpline on 0800 169 0 169.

Other formats:

If you would like this information in another language, large print or audio, please ask the department where you are being treated, to contact the patient information team: patient.information@addenbrookes.nhs.uk.

Please note: We do not currently hold many leaflets in other languages; written translation requests are funded and agreed by the department who has authored the leaflet.

Document history
Authors
Department of children’s services/ Paediatric Surgery
Pharmacist
n/a
Department
Cambridge University Hospitals NHS Foundation Trust, Hills Road, Cambridge, CB2 0QQ www.cuh.org.uk

Contact number
01223 245151
Publish/Review date
August 2016/August 2019
File name
Appedicitis_in_children.doc
Version number/Ref
1/doc id 100027