

# Bladder Augmentation

## What is it?

An operation to increase the size of the bladder.

## Background

The bladder is a stretchy muscular bag which acts as a storage container for urine. In some children with medical problems, the bladder is too small or too stiff. This may lead to problems with leaking (incontinence) or high pressure in bladder. Bladder pressures can affect kidney drainage and lead to kidney damage.

The main aims of an augmentation operation are:

1. to provide low pressure storage for urine
2. to protect kidneys from high pressures
3. improve urinary continence

## Who?

Children who have major bladder anomalies may benefit from surgical enlargement. These include children with spina bifida or other nerve disorders and those in whom the bladder has not formed properly (exstrophy) or been affected early in development (posterior urethral valves).

Children with a small bladder and high pressure may present through follow-up of a known problem – eg spina bifida, bladder exstrophy, posterior urethral valves. They may also present with urinary incontinence or kidney problems.

## What tests are performed before?

### *Ultrasound*

An ultrasound study is a non-invasive test which looks at the size and shape of the bladder, how thick the bladder wall is and how well it empties. An ultrasound can also show effects of a bad bladder on kidney drainage, by identifying back-pressure (dilatation) and loss of kidney substance.

### *Blood tests*

Blood tests to assess kidney function and electrolyte balance will be necessary before, during and after surgery.

### *Urodynamic study*

A “urodynamic study” measures the pressure profile within the bladder during filling and emptying. It provides information as to bladder capacity, pressure, stability and how strong or weak the outlet is. See “urodynamic study” document for more information

A “video urodynamic study” incorporates xray as well, to provide information on bladder and outlet shape, urinary reflux (backflow) into the ureter or up to kidneys.

### *Kidney tests*

A nuclear medicine study (DMSA scan) can show relative function of the kidneys, and demonstrate whether kidney damage or scarring has already occurred. Your child will need an injection of a substance that is taken up by the kidneys. Images can be generated of functional kidney parts.

## Intermittent catheterisation (CIC)

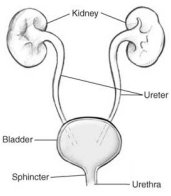
This is the regular insertion of a temporary tube (catheter) into the bladder for drainage.

Most children with major nerve problems affecting their bladder have already begun this simple process. Any child in whom augmentation is being considered will need to start CIC *prior* to surgery, as it becomes essential after bladder augmentation. (see CIC information sheet)

Once the bladder has been enlarged with non-contractile tissue, the normal bladder-emptying are abolished. even if some voiding occurs after surgery an augmented bladder does not empty completely by itself. Failure to empty an augmented bladder regularly and completely poses will pose risk of infection, renal damage and bladder rupture.

## What are the treatment options?

There are other treatments used for small capacity bladders. Augmentation is the last of these and is considered when all other treatments have failed. See information sheets on “Abnormal Bladder Function” and “Botox”.



# Bladder Augmentation

## What does the operation involve?

The operation is performed under general anaesthesia, through an incision on the abdomen.

The existing bladder is opened to form a cup. The patient's own tissues (usually from bowel or ureter) are used to make a patch over the open top of the bladder. Usually two catheters are left to drain the newly-enlarged bladder, and the wound is closed with dissolving sutures.

After the operation, pain relief is provided as required. There may be a tube through the nose to the stomach (nasogastric tube) to assist with feeding until the child is well enough to eat for themselves.

The child will be in hospital for 7-10 days after the operation. By discharge, there will usually be only a single urinary catheter. Parents and child will be shown how to look after this at home.

About three weeks after the operation, the child will have the last catheter removed. Intermittent catheterisation will restart then, if not before.

## What are the risks with this surgery?

This is major surgery and about one third of patients experience some complication. While bleeding and infection are the most common, some risks are specific to this procedure.

### *Changes in blood salts (biochemistry)*

Bowel behaves differently to bladder and salts in the urine can be absorbed by the bowel. This needs to be monitored with blood tests. The most common problem involves acid balance and may require medication from early on. The absorption from the bowel is also altered slightly and the levels of Vitamin B12 may need checking.

### *Bladder stones*

Stones occur when a mucus, bacteria and/or poorly drained urine interact. Chemicals in the urine harden and cannot be drained by the catheter. Stones are very common after bladder augmentation using the bowel. This risk can be reduced by washing the bladder out via the catheter to clear the mucus

### *Bladder rupture*

If the pressure in the bladder gets too high, the bladder can rupture. This is especially a problem if the bladder is not emptied regularly and completely. Vigilant emptying the bladder regularly helps reduce the risk. Bladder rupture occurs in 4-10% of patients after augmentation.

### *Bowel obstruction*

After any abdominal operation, bowel loops may get caught up or kinked, leading to a blockage. This is reported in 3-10% of augmentation cases.

### *Bladder cancer*

Bladder cancer has been found after bladder augmentation in up to 1 in 100 cases after 10 years. Annual review by a urologist is recommended.

## What are the outcomes?

This operation is very successful at forming a larger bladder with lower pressures.

60-100% of patients become dry (with intermittent catheterization) after surgery.

Some patients (up to 1/3) will continue to need medication after the surgery to assist with dryness. Up to 1/3 of patients may also experience change to their bowel habit.

Many people will need further procedures after their bladder augmentation. The most common reason for needing further procedures is to deal with stones (calculi). Stones occur in up to a half of patients after bladder augmentation and relate to poor emptying of the bladder and mucus accumulation.

Some patients need further surgery to become dry.

## What is the follow-up?

Patients who have had a bladder augmentation need lifelong monitoring. Regular blood tests are needed to check biochemistry. Yearly review by a urologist is recommended, with kidney ultrasound and cystoscopy to look at the bladder.