Name of Operation: **Cystoscopy and "STING" procedure (injection-treatment for kidney-reflux via a camera in the bladder)**

Main issues:

- Where the ureter (the tube that carries urine from the kidney) drains into the bladder, there is normally a one-way "valve." If this valve is "loose," it can cause kidney-reflux (some urine going the wrong way back up to the kidney). This can lead to several problems: recurrent urine infections, kidney damage and, rarely, stones or wetting.

- A loose valve may improve on its own in early childhood. If not, there is unfortunately no medication to cure this problem. However, this loose valve can be "tightened" by camera-surgery to inject around it with a "bulking agent" called Deflux® (a "STING" procedure), or by re-plumbing it during open surgery (ureteric reimplantation).

- No external cuts or wounds.

- Blood in urine, and sore to pee for a few days afterwards (paracetamol helps).

- A catheter (tube) is occasionally left in the bladder for a few days afterwards.

Intended benefits:

- To tighten up the "valve," to stop/reduce the amount of reflux of urine to the kidney(s).

- This should reduce the risk of recurrent serious urine infections or kidney stones, and should help the bladder to work better (so may also reduce wetting).

- However, research suggests that this operation will *not* reduce the risk of future damage to the kidneys any better than preventative antibiotics do.

- Unfortunately, this operation will also not reverse any previous damage to the kidneys.

Common or serious risks:

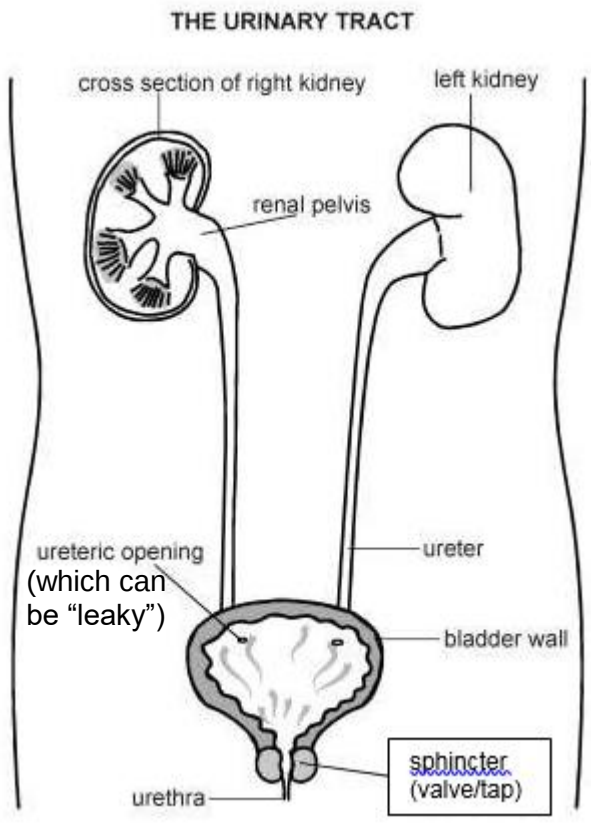
- Being unable to carry on with (or to finish) the operation, due to unexpected technical problems with the equipment on the day. The operation may then need repeated another day.

- Bleeding: rarely serious, but a little blood may appear in the urine over the next day or two. It usually settles if your child drinks plenty. If blood appears in the urine a week or so later, a urine sample should be checked for infection via your family-doctor.

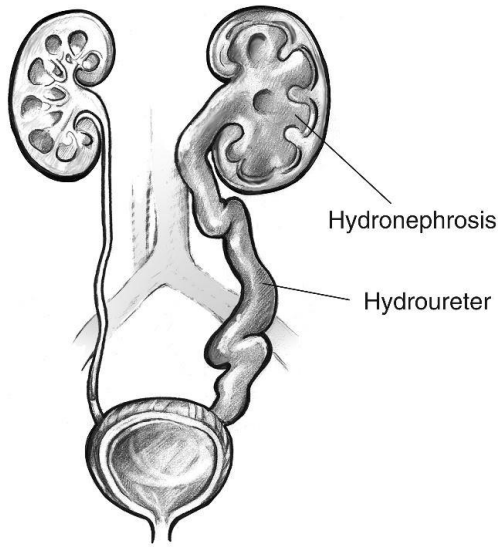
- Infection: usually prevented by the antibiotics given in theatre, and by drinking plenty for a few days afterwards, and by the preventative antibiotics your child is already on (please give a double-dose on the evening of the operation). If you are worried, a urine sample should be checked for infection via your family-doctor or, if your child is very unwell, via your local hospital (sometimes such an infection can be quite serious).

Common or serious risks (cont'd):

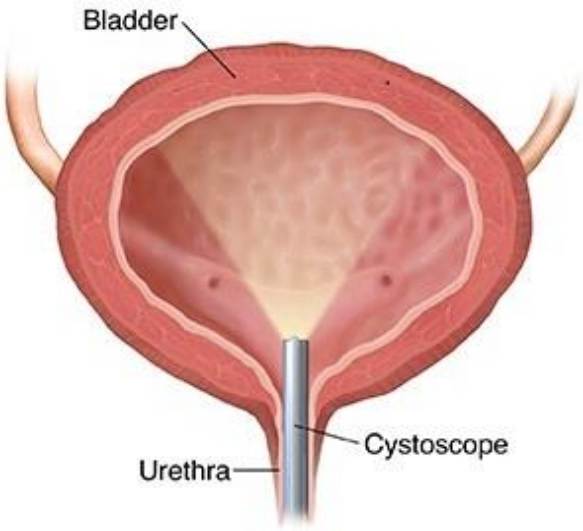
- Damage to the bladder and/or the pee-pipe (urethra), including perforation (leak of urine): rare, and usually settles with a catheter in the bladder for a few days.
- Damage to the bowel (which is immediately behind the bladder), including perforation (leak of poo): very rare indeed, but may need an urgent open operation to repair.
- Occasionally, it is impossible to perform the injection-treatment, because of an unusual position of the ureter (the tube that carries urine from the kidney to the bladder). Further surgery may be needed later.
- Continuing kidney-reflux in about 1 out of 3 children: sometimes this can lead to serious kidney infections and kidney damage. Further surgery may be needed later.
- Blockage of the ureter: very rare indeed, but further urgent surgery may be needed.
- The Deflux® product has been used in children since 1995, and there are no known safety issues from it so far. However, it is theoretically possible that serious unexpected problems from it could show up in the future, even many years later.
- Anaesthetic problems (rarely serious, but around 1 in 250,000 general anaesthetics in children can be fatal).



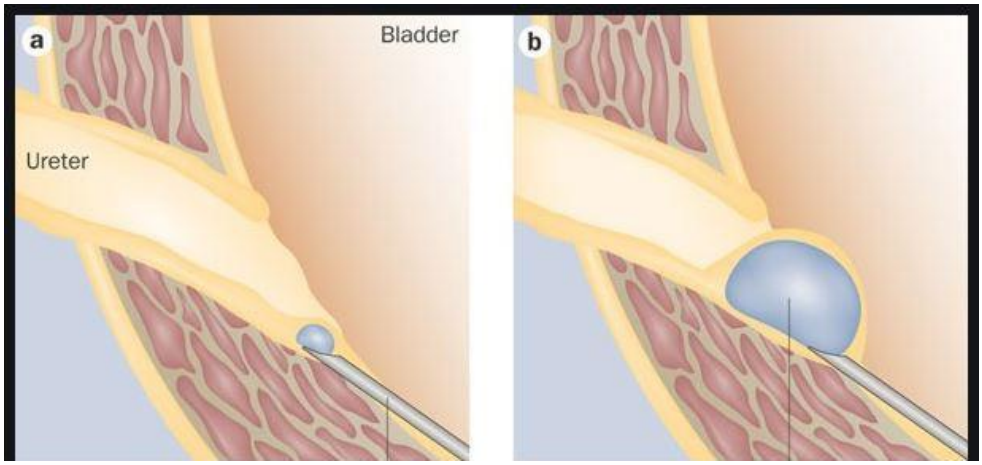
1. A diagram of normal waterworks
(based on www.fermelumic.comurinary.html#)



2. A diagram of a kidney stretched by reflux *(from https://www.niddk.nih.gov/news/media-library/7683)*



3. A diagram of a cystoscope (telescope) going along the urethra (pee-pipe) into the bladder *(from www.fairview.org/patient-education/85434)*



4. A diagram of how the STING procedure works: the expanding blob at the tip of the needle is injected sealant *(from C. Cooper, Nat Rev Urol, 2009, 6: 481–489. https://doi.org/10.1038/nrurol.2009.150)*