

# Bladder function assessment

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Flow rate and ultrasound scan residual urine Men with LUTS and women with recurrent UTIs or LUTS are frequently investigated with a flow rate and a USS residual urine at the first clinic appointment ( Figures 81.30–81.32 A peak flow rate (  $Q$  ) in excess of 15 mL/s suggests that max significant BOO is not present, whereas a flow rate of  $<10$  mL/s suggests that BOO is present. A very low flow rate with a very protracted pattern of voiding is suggestive of a urethral stricture. Caution is required when interpreting the significance of a single high USS residual volume; repeated tests often give a more representative picture of the degree of bladder emptying. Urodynamics A urodynamic evaluation provides information about bladder pressure and urine flow and has been referred to as a pressure– flow study . The test is performed to investigate patients with unexplained or complicated LUTS or incontinence. It is also commonly used in patients with a suspected bladder neuropathy . A device for urodynamic assessment is shown in Figure 81.33 . During urodynamics, fine catheters (or a dual- lumen catheter) are inserted through the urethra into the bladder to allow bladder filling and to record the intravesical pressure. Involuntary rises in the intravesical (detrusor) pressure during ). the filling phase, with or without a desire to void, are a classical sign of an overactive bladder. High intravesical pressure during voiding with a reduced flow rate is typically seen with BOO. An atonic bladder (no detrusor activity) is seen in diabetic neuropathy and in some patients following abdominoperineal excision of the rectum when damage to the pelvic nerve

## (d) Vascular Excretion Concentration Half-time excretion (8–12 min) Activity

5 10 15 20 Minutes

(a) (c) Figure 81.29 Curves from a series of mercaptoacetyl triglycine renograms (red line for right kidney; blue line for left kidney). (b) The left kidney graph does not go downwards, suggesting accumulation of radiotracer in the kidney – a sign of out /f\_l ow obstruction. (c) Both the graphs show prolonged plateau phases, suggesting slow drainage from the kidneys – suggestive of bilateral dilated non-obstructed systems. (d) The right kidney shows a plateau phase with a delayed decline in the curve, suggesting a partially obstructed right system. (a) (b) Figure 81.30 (a) A /f\_l ow meter for use in males. (b) A /f\_l ow meter for females (b) (d) (a) Normal excretion.

plexus has occurred. Detrusor-sphincter dyssynergia - when coordinated contraction of the detrusor muscle in conjunction with relaxation of the external sphincter, necessary to permit normal voiding, is lost - is often seen in neurological conditions such as multiple sclerosis.  
Summary box 81.10 Assessment of bladder function /uni25CF /uni25CF /uni25CF /uni25CF

Figure 81.31 A /f\_l ow study from a young healthy male patient showing a high-volume rapid void with an excellent peak /f\_l ow of 32 mL/s. The upper curve shows the /f\_l ow rate of urine while the lower graph shows total urine voided. Figure 81.32 A /f\_l ow study performed by a patient with bladder outlet obstruction showing a reduced peak /f\_l ow of urine (8.1 mL/s). Simple tests are a /f\_l ow rate and a USS residual urine estimation Urodynamics provides a pressure- /f\_l ow pro /f\_i le Urodynamics requires /f\_i ne catheters to be inserted into the bladder and usually the rectum A non-invasive technique in males using a penile cuff has a limited clinical role Figure 81.33 A modern urodynamic machine.

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