Trial without catheter

Removal of a urinary catheter from the urethra and subsequent monitoring for the passage of urine is known as a 'trial without catheter'. With up to 100 million urinary catheters being in use at any one time (Havard, 2014) and up to 90 000 patients with long-term catheters in the UK community (Gage et al, 2017), their removal is likely to be a frequent undertaking for junior doctors. It is therefore essential to be aware of the most up to date recommendations to aid a smooth and successful trial without catheter.

Considerations before trial without catheter

There are some critical factors to keep in mind before removal of a catheter.

Have the indications for catheterization been addressed?

There are numerous indications for the insertion of a urethral catheter (*Table 1*) (Gokula et al, 2004) and it is vital to ensure that these have been addressed and managed before removing a catheter. Simple interventions include treating any constipation and reviewing medications that may have contributed to urinary retention. Key medications contributing to urinary retention are anticholinergics, antihistamines, antipsychotics, antidepressants and opioids.

Where there is an absolute contraindication for trial without catheter, the catheter should remain in situ before further intervention. An example of this is chronic high pressure retention where the catheter should not be removed before dealing with the bladder outlet obstruction.

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Is the patient taking an alpha-blocker?

Alpha-adrenergic antagonists block the sympathetic stimuli to the prostate, mediating prostatic smooth muscle relaxation and facilitating micturition, and are thus regularly prescribed in patients with benign prostatic hyperplasia (Lepor, 2007). There is evidence that their use may increase the rate of successful trial without catheter in men presenting with acute urinary retention (Fisher et al, 2014).

Nine randomized controlled trials studied the role of four alpha-blockers and the subsequent successful resumption of voiding without the need for re-catheterization within 24 hours. A successful trial without catheter was observed more frequently in those given alpha-blockers in comparison to placebo (60.2% *vs* 38.1%, relative risk 1.55, 95% confidence interval 1.36–1.76).

On further subgroup analysis, statistically significant increases in the rate of successful void post-trial without catheter were seen with the alpha-blockers alfuzosin, tamsulosin and silodosin. In addition, the use of the uro-selective alpha-blocker tamsulosin has been demonstrated to be superior to placebo in men with acute urinary retention secondary to benign prostatic hyperplasia for a successful trial without catheter (Fisher et al, 2014).

Although not accurately reported in the above studies, it is essential to consider and discuss the side effects of alpha-blockers with patients, which include postural hypotension and headache. Patients presenting to accident and emergency with acute urinary retention secondary to benign prostatic hyperplasia will often be discharged with tamsulosin or alfuzosin in preparation for trial without catheter if their electrolytes and renal function are normal and residual volume is less than 1000 ml. Alpha blockers should be started a few days before the trial without catheter.

Should antibiotics be given before trial without catheter?

It is not routine practice to prescribe prophylactic antibiotics for the prevention of urinary tract infection when removing a urinary catheter (Lusardi et al, 2013). In patients with long-term indwelling catheters who are having a catheter change, the National Institute for Health and Care Excellence (2015) currently advocate the use of prophylaxis only if there is a history of symptomatic urinary tract infection following previous changes. Antibiotics may also be prescribed after urological operations and urine samples sent for culture lest infective complications arise later on.

Table 1. Indications for urethral catheter insertion

Indication	Examples
Urinary retention (acute and chronic)	Bladder outlet obstruction, poor detrusor muscle function, medications, constipation
Fluid balance monitoring in the intensive care setting	Severe sepsis, renal or cardiac failure
Perioperative use	Specific urological procedures, long operative times, requirement for monitoring of urine output perioperatively
Aid the healing of wounds	Perineal or sacral wound healing in incontinent patients
Palliative	Comfort and dignity at the end of life

Where to trial without catheter

There may be instances in which trial without catheter can be performed safely in the community. Examples include simple acute urinary retention and following a failed trial without catheter postoperatively. However, trial without catheter in the community is currently rarely done in the UK because of a lack of staff and equipment. That said, community centres can carry out trials without catheter if they can arrange to cohort patients.

There are certain situations in which a trial without catheter must be performed in the hospital setting. Such conditions include previous difficult or failed catheterization attempts (which would make it challenging to catheterize in the community) and in patients with impaired cognitive function.

When to trial without catheter

The urinary catheter should be removed as soon as clinically indicated as prolonged periods of urethral catheterization are associated with increased incidence of urinary tract infection (Kalsi et al, 2003). Urinary tract infection is the most common hospital-acquired infection and a staggering 56% of these are associated with use of urinary catheters. Urinary catheters can cause urethral irritation, patient discomfort, trauma to the urinary tract and decreased quality of life. The patient would ideally have opened his/her bowels in the previous 24 hours as constipation is related to a failure of trial without catheter.

There are two suitable times for a planned trial without catheter. The first is midnight, so the patient can subsequently sleep, allowing the bladder to fill and hopefully void on waking. A suggested advantage of a midnight trial without catheter is early discharge with an improved patient flow through hospitals. The second appropriate time for trial without catheter is 6 am, allowing for monitoring of bladder volume and voiding during the day with the benefit that the medical team will be on hand to assist with any problems or queries which may arise. There is no compelling evidence to support one particular time.

How to trial without catheter

Before removing the catheter, it is crucial to ensure that the catheter balloon is fully decompressed. Once the urinary catheter has been removed, it is essential to explain to the patient to monitor his/her fluid input and output and also to be aware of the symptoms and signs of acute urinary retention (*Table 2*). If patients have a catheter valve, do not empty the bladder before removing the catheter in order to decrease the time spent waiting to void. For this reason, some units prefill the bladder before trial without catheter to reduce waiting time.

The patient should be advised to drink 1.5–2 litres of fluid per day to stimulate the bladder sufficiently. It is useful to warn the patient that he/she may experience some dysuria and haematuria on first void, which is secondary to urethral irritation by the catheter.

How to define a successful trial without catheter

There is no accepted universal definition of a successful trial without catheter. However, there are a number of factors which are taken into consideration. Trial without catheter may be considered successful if the patient can empty the bladder effortlessly without significant post-void residual (usually <300 ml). A safe residual volume (post-void) is difficult to quantify. Owing to large test–retest variability and lack of outcome studies, no post-void residual threshold for treatment decision has yet been established (Gravas et al, 2017). For this reason, it is essential not to be dogmatic about when to replace a catheter. For example, if a man has had a transurethral resection of the prostate for chronic retention and voids 500 ml but leaves a residual of 300 ml, he may not be recatheterized but watched, while a man voiding 100 ml and leaving 200 ml may be heading back into retention. A safe post-void residual also depends on the reason for the catheter placement. If the patient had pre-existing large residual volumes, then the ratio between voided volumes and retained volumes must be considered.

Table 2. Symptoms and signs of urinary retention following trial without catheter

Symptoms	Abdominal or suprapubic pain
	Inability to void
	Hesitancy, poor flow, dysuria
Signs	Suprapubic tenderness
	Palpable bladder
	Suprapubic dullness to percussion

TOP TIPS

- Trial without catheter early in the morning, this allows for any problems to be managed during the day when there is sufficient support.
- Advise the patient to drink 4–6 cups of fluid within a 2-hour period to sufficiently fill the bladder before voiding so that trial without catheter can be monitored within a reasonable time-frame.
- Warn patients that some dysuria is common after removing an indwelling catheter.

The patient is expected to pass urine within the first 6 hours following trial without catheter and the patient is often monitored over the course of multiple voids (usually two or three). If resources allow, urinary flow rates can be measured. The passage of over 5 ml of urine per second indicates a successful trial without catheter (Zeif et al, 2010). A typical trial without catheter takes 4–5 hours. An example algorithm of the trial without catheter process is shown in *Figure 1*.

Younger age, lesser initial residual volume, a smaller prostate (on digital rectal examination and ultrasound; Bae et al, 2008) and lack of constipation have all been suggested to favour a successful trial without catheter in men presenting with acute urinary retention. Duration of catheter insertion and choice of alpha-blocker have not been found to affect success rates of trial without catheter (Paul et al, 2016).

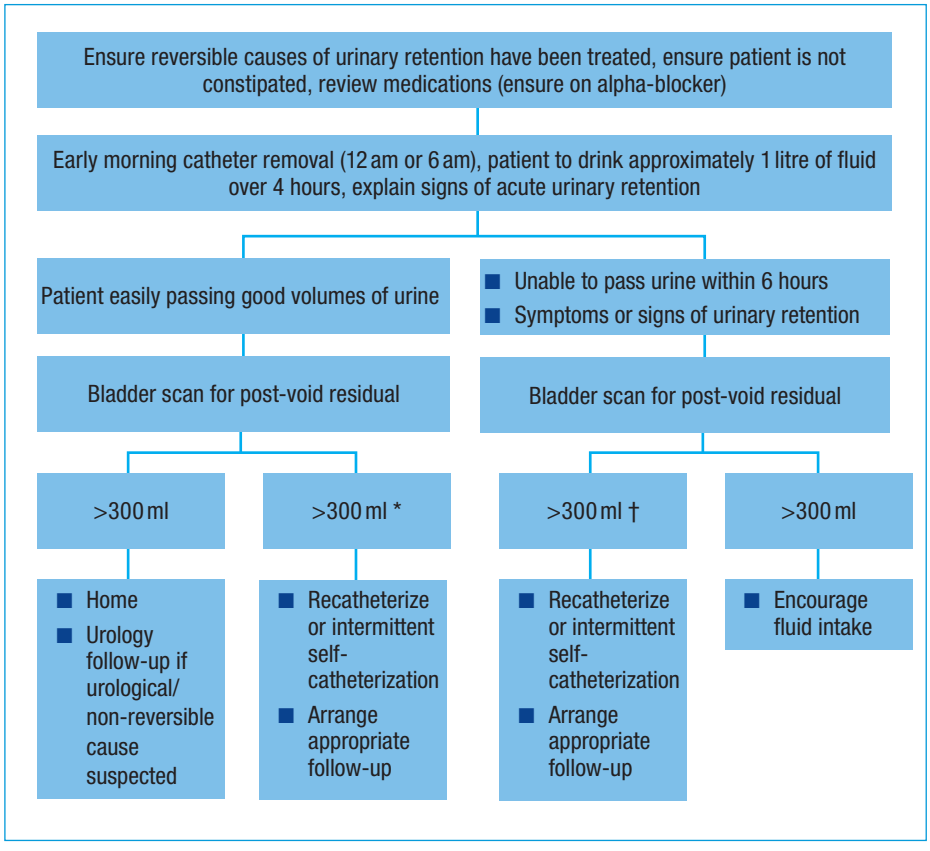
Failure of trial without catheter

If the patient is unable to pass urine adequately following trial without catheter, additional assistance will be required to empty the bladder. A urethral catheter can be reinserted with a view to re-attempt trial without catheter in the community or nurse-led clinic. The catheter may need to remain in situ until definitive treatment is performed (e.g. prostatic resection in benign prostatic hyperplasia). A catheter valve can be placed on the end of the urethral catheter, in place of a catheter bag, which allows for regular, patient-controlled bladder

KEY POINTS

- Always ensure that the reason for catheter insertion has been addressed and managed.
- Prescribe an alpha-blocker (e.g. tamsulosin) a few days before trial without catheter in men presenting with acute urinary retention.
- Ensure the catheter balloon has been fully decompressed before attempting to remove the catheter.
- Once the catheter has been removed, monitor for acute urinary retention before sending the patient home.
- Serial voids, post-void residual bladder scans and urinary flow rates are used to confirm success of trial without catheter.
- If trial without catheter fails, a patient will require re-catheterization or intermittent self catheterization, along with appropriate follow-up.
- Antibiotics are not routinely prescribed before catheter removal.

Figure 1. An algorithm for the trial without catheter process. * Do not replace catheter only on residual volumes. If the patient is voiding well, and post-void residual is >300 ml he/she may be observed. † If the patient has not voided but is comfortable at residuals >300 ml, he/she may have a large capacity bladder and may need to fill the bladder further before he/she gets the sensations and desire to void.



emptying. When a trial without catheter fails and the patient cannot be catheter free, a suprapubic catheter with a valve can prevent multiple catheterizations, be simpler to manage and more comfortable to wear. Intermittent self-catheterization should be considered if the patient is deemed to be suitable. Suitability for intermittent self-catheterization includes patient willingness, reliability, adequate cognitive function and sufficient manual dexterity. However, intermittent self-catheterization is largely unsuitable for patients with overactive bladders. Remember to provide the patient with information regarding the care of the catheter and any appropriate follow-up. Finally, do remember to arrange supplies of materials and disposables.

Conclusions

A trial without catheter is a frequent procedure experienced in the hospital environment and it is essential for junior doctors to be aware of the process as well as solutions for commonly encountered issues. Easy passage of urine with a low post-void residual bladder volume can indicate a successful trial without catheter. However, the signs and symptoms of urinary retention following trial without catheter must be monitored for and dealt with appropriately. **BJHM**

Conflict of interest: none.

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