Guidance on Management of Blocked Catheters and Use of Catheter Maintenance Solutions

Date effective from:	**March 2023**	**Review date:**	March 2025
Approved by: Governance Group	Angus health & Social Care partnership Clinical Care & professional		
Approval Date:	27th March 2023		
Author/s:	Short Life Working Group: Continence Formulary Group		
Target Audience	GPs and Practice Nurses Treatment Room Nurses District Nursing Service Community Learning Disability Nurses Health and Social Care Staff Private Healthcare Providers Hospital Staff Care Home Staff		
Keywords (min. 5):	CMS (Catheter Maintenance Solutions) Intermittent Catheterisation CAUTI (Catheter Associated Urinary Tract Infection) Haematuria Encrustations IUC (indwelling urinary catheter)		

Version Control

Date	Author	Version/Page	Reason for change

1.0 Purpose

The aim of this guidance is to provide information on best practice guidance for management of blocked urinary catheters and the criteria for the use of catheter maintenance solutions (CMS).

Urinary catheters are used for a wide range of reasons. They are associated with a number of complications including: Catheter-associated urinary tract infection (CAUTI); Tissue damage; Bypassing and blockage. Because of these risks, catheters should be used only after all alternatives have been considered, and use should be discontinued as soon as possible (Loveday et al, 2014). Blockages and bypassing of indwelling urinary catheters occur where the draining urine seeps around the outside lumen of the catheter as a result of eyelets becoming blocked by debris, tissue or encrustation (Loveday et al, 2014; Yarde, 2015; Holyroyd 2017). Nearly 50% of patients with indwelling urinary catheters will experience blockages due to encrustation (Getliffe, 1992, Yates 2018).

2.0 Scope

This guidance applies to all Healthcare workers, across all sectors who are involved in the care of patients with indwelling urinary catheters.

3.0 Roles and responsibilities

3.1 Managers

Senior clinical managers are responsible for the operational implementation of these guidelines in their area relating to care and management of urinary catheters.

Line managers/ Team leaders / Care Home Managers are accountable for ensuring that all appropriate staff under their management have access to relevant training and are competent in all aspects of management of urinary catheters.

3.2 All staff

Healthcare professionals carrying out catheter care are responsible for ensuring that they have been appropriately trained and are accountable for their actions in line with guidelines from the relevant professional body.

Staff should follow all policies, guidelines and procedures relating to catheter care working in line with best practice. They must report any concerns relating to catheter care to their line manager.

4.0 Stakeholder consultation

Lead Nurses District Nursing HSCP

Nursing Team Leaders

District Nurses

Community Staff Nurses

Infection Prevention Control

NHS Tayside Urology and Diagnostic Treatment Team

Community Hospitals

Professional Practice Development

Prescribing Support

Care Home Managers

5.0 Guidance

5.1 Catheter Blockage

If a catheter appears blocked / bypassing, review the need for indwelling urinary catheter. If a urinary catheter is no longer required see guidance for Trial without Catheter in the Community Setting. If still required check for mechanical reasons for blockage.

Table 1 Causes of Mechanical Dysfunction of Urinary indwelling Catheter

Causes	Action
Kink in tubing, strapping, etc.	• Check tubing , strapping and clothing
Drainage bag above bladder	• Ensure drainage bag is below bladder
Mucosal occlusion i.e. mucosa of the bladder drawn into eyelets of catheter caused by drainage bag being too low.	• Ensure correct positioning of drainage bag. • Correct negative pressure.
Bladder spasms, overactive bladder.	• Check inflation of balloon; • Consider catheter size, • Advice re ↑fluids ↓caffeine etc. • Consider anti cholinergic medication, caution with over 65yrs.
Constipation	• Assess bowels • Address any issues with constipation • Advice re fluids and diet. • National Hydration Campaign Materials | National Services Scotland (nhs.scot) • Consider aperients.
Drainage bag too full	• Ensure drainage bags are emptied timeously.
Blockage due to sediment, debris	• Consider use of open ended catheter

Infection	• http://www (scot.nhs.uk)
Encrustations	• Consider changing catheter more frequently. It has been suggested that the life spans of three catheters need to be monitored before a clear drainage pattern will emerge (Yates, 2004). • Monitor urine patient's urinary pH pH monitoring chart the life of the catheter can be established and possibly avoid problem with blockage, (Gibney 2016) • Encourage citric based fluids • Consider Citric acid CMS solutions in line with manufacturers' instructions.

If the catheter remains blocked following the above checks and is still required, it should be replaced. The cause of the blockage needs to be established before a treatment regime is commenced. Around 50% of people with a suprapubic or urinary urethral indwelling catheter will experience problems with catheter blockage due to encrustation (Gibney, 2016).
The removed catheter should be examined for evidence of encrustation. If encrustation has occurred as a result of alkaline urine then regular ph monitoring should be carried out and a personalised catheter maintenance programme planned and documented.

5.2 Administration of Catheter Maintenance solutions

5.2.1 Points to consider

There is currently very limited evidence on the benefits of using catheter maintenance solutions (CMS) to maintain long term indwelling catheters. That said CMS can reduce the build up of mineral deposits, debris or blood clots which can lead to catheter blockage and therefore reduce the frequency of need for re-catheterisation. They may also minimise urothelial damage by reducing encrustation prior to catheter removal.

However, catheter maintenance solutions should **not** be used to**:**

- **Prevent catheter associated infection** (see figure 1). They should only be instilled after considering that the risk of obstruction is greater than the risk of infection, caused by interrupting the closed drainage system.

- **Unblock catheters.** Instillation of CMS should have a clinical rationale and should only be used to extend the lifespan of a catheter when frequency of catheter changes due to blockage as a result of encrustations is unacceptable to the patient.

- **Unblock catheters on patients with spinal injury** due to the possibility of autonomic dysreflexia (the most common cause being bowel or bladder stimuli). The catheter should be changed immediately.

Remember:

- **can cause mucosal trauma within the bladder** caused by the process of administration, especially if the solution used is acidic or if any force is used, resulting in haematuria, pain and discomfort. (Holyroyd, 2019)

- A delay in an indicated re catheterisation causes prolonged patient discomfort and distress.

5.2.2 Administration

There is no clear evidence on how often a Catheter Maintenance Solutions **(**CMS) should be instilled for it to be effective. Frequency will depend on clinical judgement based on PH reporting. Instillations should be administered with caution and in line with manufacturer`s instructions and 100ml instillations should not be used. The catheter holds little more than 4 ml and therefore, to dissolve any encrustation, only a small amount of the solution is required to fill the lumen of the catheter and bathe the tip, (Gibney 2016). The use of two 50ml sequential instillations could dissolve more encrustation than a single instillation of 100ml (Getcliffe,2000) The use of careful gentle agitation and gravity assisted administering the product appears to dissolve encrustation more effectively than over a longer period of time (Getcliffe,1999). If a large amount of the solution enters the bladder, there is the potential risk of chemical irritation to the mucosa.

Catheter Maintenance Solutions are sterile prefilled prescription-only products; they should only be used when all other options have been considered to extend the lifetime of an indwelling urinary catheter by maintaining its patency (Thomas, 2020).
Citric acid solutions 'G' and 'R' have been found to potentially dissolve encrustation, but it has also been identified that they should be used with caution, as their benefits may be outweighed by inflammatory tissue reactions (Getliffe, 2002, Thomas 2020).
Several considerations must be made:

- **An individual risk assessment.**
- **Clear rationale for use is documented.**
- **Frequency of administration should be according to severity and manufacturer's instructions.**
- **Always use sterile gloves and ensure an aseptic technique procedure is followed.**
- **Warm solution to room temperature.**
- **Leave solution in situ in line with manufacturer's instructions.**
- **Record the effectiveness of the intervention each time.**
- **Consider using a closed irrigation administration set (inserted into the needle-free sample port of the catheter bag) to minimise the risk of infection caused by breaking the closed drainage system - Linc Infusion Kit.**

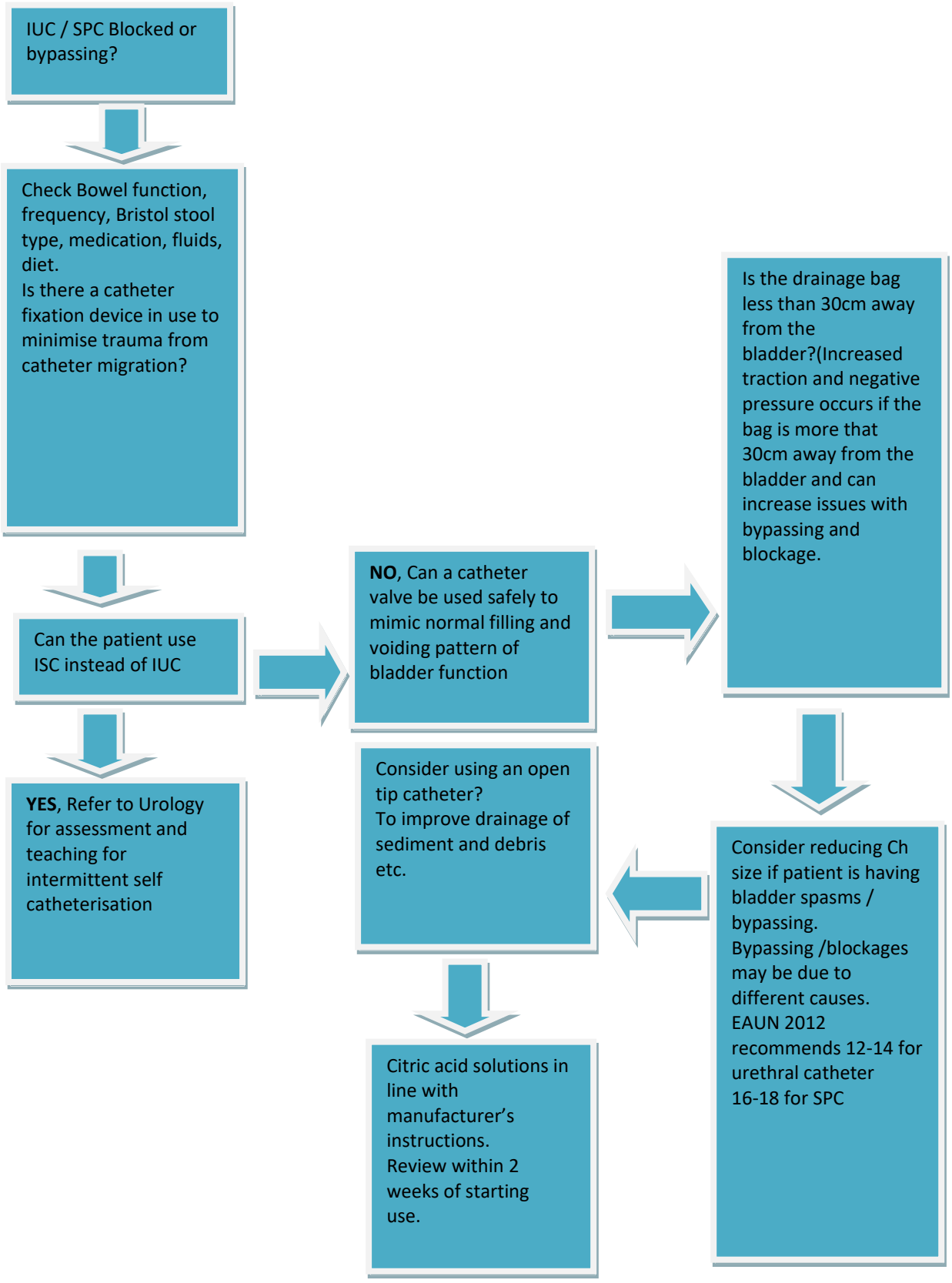
(RCN, 2021)

5.3 Types of maintenance solution

Type	Description	Choice	Available on Prescription	Costs
Sodium Chloride 0.9% Saline	**Neutral solution ph 7** - recommended for flushing debris and small blood clots. Will not dissolve crystals.	• First choice • Second choice	• Bard Optiflo S 50ml **CSS50** • B Braun Urotainer NaCl 50ml **FB99849**	• £3.58 • £3.70
Solution G	**Citric acid 3.2% ph 4** - Intended to dissolve crystals. Which form on the tip of the catheter	• First choice • Second choice	• B Braun Uro-tainer Suby G (2x30ml) **9746609** • Bard Optilflo G 50ml **CSG50**	• £5.70 • £3.80
Solution R	**Citric acid 6% ph 2** - stronger citric concentration for more persistent crystallisation potential mucosal irritation	• First choice • Second choice	• B Braun Uro-tainer Solution R(2x30ml) **9746625** • Bard Optiflo R 50ml **CSR50**	• £5.70 • £3.80
Polyhexanide	**PHMB0.02% Polyhexanide**	**On recommendation of Urology Specialist only**	• Uro-tainer PHMB Polyhexanide 0.02% 100mls FB99965	• £3.59

Product	Comments	Available on prescription	Cost
L.IN.C Medical Bladder Infusion Kit (Pack of 10)	Consider use to prevent unnecessary breakage of the closed drainage system. For example where CMS is being administered more than once per week out with valve or drainage bag change.	MCI/701	£20.56

Appendix 1 - Guidance at a Glance – Urinary Catheters (RCN 2021)



References

Getliffe, K (1992) "*Encrustation of Urinary Catheters in Community Patients".* PhD thesis, University of Surrey.

Getliffe, K (2002). "*Managing recurrent Urinary Catheter Encrustation"*. British Journal of Community Nursing, 7(11), 574-580.

Gibney, L (2016) *"Blocked catheters; Can they be better managed"* British Journal of Nursing, 2016, Vol 25, No 15

Holyroyd, S (2017)," *A new solution for the indwelling catheter encrustation and blockage",* Journal of Community Nursing; 2017, Vol 31, No1

Loveday, H et al (2014) epic3: national evidence based guidelines for preventing healthcare associated infections in NHS hospitals in England. *Journal of Hospital Infection;* 86: S1, S1-S70.

Royal College of Nursing (RCN).Catheter Care. Guidance for Healthcare Professionals. 2021. At: https://www.rcn.org.uk/professional-development/publications/catheter-care-guidance-for-health-care-professionals-uk-pub-009-915

Thomas, K (2020) "*Use of catheter maintenance solutions by community nursing staff*: *an assessment"* British Journal of Community Nursing February 2020 Vol 25, No 2

Yarde, D (2015) *"Managing indwelling urinary catheters in adults*". Nursing Times; 111: 22, 12-13.

Yates, A (2018) *"Using patency solutions to manage urinary catheter blockage Nursing*" Times [online] May 2018 / Vol 114 Issue 5