

# Prolonged and Increased Usage of a Flexible Ureterorenoscope: The Maelor FURS Protocol

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## ABSTRACT

We present our point of technique detailing the specific preoperative and postoperative steps used in our institution to prolong the use of a flexible ureterorenoscope, and discuss the potential cost-effectiveness of this protocol. We have used a single flexible ureterorenoscope, for 145 consecutive cases to date, using the protocol described in this article. This prolonged use has resulted in a calculated cost per case of £273.48 GBP. We have described our experience of a dedicated protocol to prolong the usage of a single flexible ureterorenoscope. We would consider recommending the technique described in this article, to prolong flexible ureterorenoscope usage in a cost-effective manner.

**Key Words:** *Flexi ureterorenoscope. Laser lithotripsy. Maelor protocol.*

## INTRODUCTION

Flexible Ureterorenoscopy (FURS) is increasingly used worldwide, allowing effective treatment of stones in all calyces using a single procedure, with a high stone-free rate, as well as being able to diagnose and effectively treat upper tract transitional cell cancer. However, because of their fragile nature, FURS can be associated with high costs due to damage, resulting in repair or replacement. Several reports of optimum perioperative care to prolong usage have been described.<sup>1,2</sup> But to our knowledge, very little data exists about preoperative and postoperative care. This article describes the use of a dedicated protocol, including specific preoperative and postoperative steps, for prolonged usage of FURS at our institution. We also describe the cost-effectiveness data generated, because of this protocol.

**Presentation of Technique:** At our institution, since March 2015, we strictly introduced technique called Maelor FURS protocol for all upper tract stone and TCC cases, using the Olympus P6 flexible ureterorenoscope. until March 2017, using the following steps in the protocol, the same scope has been used for 145 consecutive cases.

**Preoperative Protocol:** The Olympus P6 scope is only handled by educated and trained senior nurses, who have undergone a formal protocol driven programme and subsequent competency verification, at our institution.

The scope is stored in a dedicated room which is 5x2 feet wide, containing a cleaning unit and a drying cupboard, where the scope can be hung at built-in hooks (Figure 1).

When required for a urological procedure, the pre-cleaned scope is transported in a sterile device, containing a sterile plastic bag wide enough to accommodate large coiled loops.

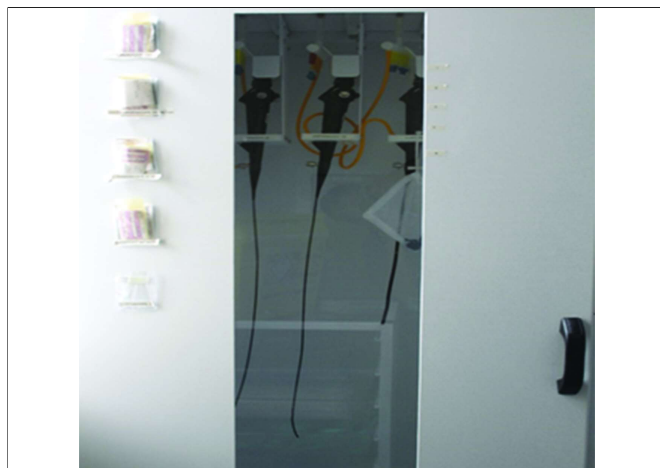


Figure 1: Cupboard with hanging scopes.

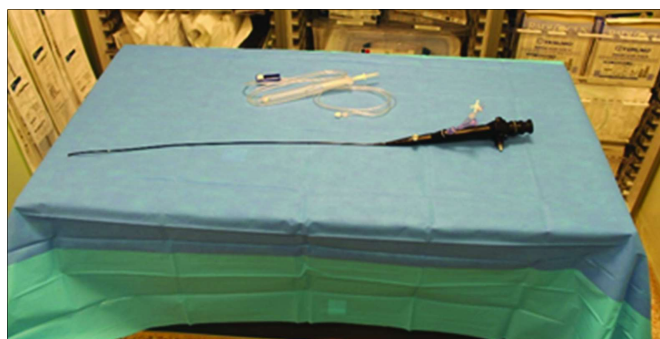


Figure 2: Scope on trolley.

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**Perioperative Protocol:** Once ready to be used, the scope is taken out of the container onto a sterile instrument trolley, which is 4x3 feet long covered by a sterile waterproof sheet. The scope is always kept straight on the trolley, including connecting light guide cable, camera head and irrigation tubing, to avoid any inadvertent damage (Figure 2).

Commonly described perioperative steps in the urological literature are used during the procedure, and whenever the scope is not in use, it is always transferred back onto the trolley.<sup>3</sup>

**Postoperative Protocol:** Once the urological procedure has been completed, a standard operating protocol is used, by a senior nurse, including guidelines for transportation, cleaning and storage. Precleaning is performed before transfer to the decontamination room. The exterior surface of the scope is washed with soft cloth soaked with cleaning solution, and the working channels are flushed with solution and air. The pre-cleaned scope is then transferred to the decontaminated area, keeping the scope moist but not submerged in liquid during transport. A leak test is performed by removing all port covers and fiction valves, and the scope is then pressurised to the recommended pressure. Pressure is maintained, and the scope is inspected for minimum 30 seconds. Scope processing is performed in dedicated room with uni-directional workflow to clean area and the door closed all the time. Processing is performed by a senior trained nurse, who has received education and competency verification activity related to scope cleaning. All precautions including surgical mask with eye protection, fluid resistant gown, surgical gloves and fluid-proof shoe covers are employed. The scope is manually cleaned with cleaning solution, including the working channel. The exterior surface and channels are then dried with instrument air. Inspection of the cleaned scope for cleanliness, missing parts, lens clarity, integrity of seal and gaskets, any physical or chemical damage, moistures and functions, is then performed. The inspected scope is then exposed to high level disinfectant and sterilisation, with care taken that the scope is in complete contact with the solution. After disinfection, the scope is rinsed with sterile water and then dried, using a mechanical processing drying system. The scope is then stored in the drying cupboard with sufficient height, width and depth to allow scope to hang vertically without coiling and not touching the cabinet bottom (Figure 1). The scope is stored with all valves opened and clear cue to identify a clean scope ready for use. The scope is sent for routine service after a cycle of 25 cases.

The described Maelor FURS protocol, incorporating strict preoperative and postoperative steps, represents a potentially cost-effective method to prolong life of a flexible ureterorenoscope.

**Table I:** Cost-effectiveness data, using Maelor FURS protocol.

Number of uses	Overall cost (GBP)	Cost per case (GBP)
25	£18,091.00 (12700 + 5391)	£723.64
50	23,482.00 12700 + (2 x 5391)	£469.94
100	£34,264.00 12700 + (4 x 5391)	£342.64
145	£39,655.00 12700 + (5 x 5391)	£273.48

## RESULTS

We have performed 145 cases from March 2015 to March 2017. As such, and if an average cost of Olympus P-6 URS at £12700 GBP is used, and the service cost contract (per 25 cases) at £5391 GBP, the cost per case has been calculated as £273.48 (Table I).

## DISCUSSION

While several reports in the literature have discussed specific perioperative steps to increase the life of a flexible ureterorenoscope, in this article we have described our experience of a dedicated protocol to prolong the usage of a single flexible ureterorenoscope, the Maelor FURS protocol. This involves a series of very specific and comprehensive preoperative and postoperative care steps, which we believe, in addition to the well described perioperative steps in the urological literature, further prolong the life of a modern flexible ureterorenoscope.<sup>4</sup> Working in a district general hospital, the pressure on costs and repair/replacement is very significant. As such, it is extremely reassuring that using our protocol, the average cost was relatively low, at £273.48 per case. We would consider recommending the technique described in this article, to prolong flexible ureterorenoscope usage in a cost-effective manner.

## CONCLUSION

We conclude that by using Maelor FURS protocol, the life span of FURS can be prolonged, which ultimately resulted in cost-effectiveness. We strongly recommend Maelor FURS protocol to be incorporated for providing quality care and cost benefit for trust.

## REFERENCES

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