

Quality Improvement Project on Pre-operative Screening for Bacteriuria in Urological Surgery *by Amaar Ali*

Background

Bacteriuria is a recognized risk of post-operative complications in urological surgery. Pre-operative testing for bacteriuria is standard practice in Urology to identify high risk patients for antibiotic treatment.

At the 'Royal Berkshire Hospital' (RBH) patients are pre-screened with a urine dipstick (UD) before being selected for urine culture (UC). Positive UCs are treated with antibiotics for eradication of bacteriuria pre-operatively (*figure 1*).

This Quality Improvement Project (QIP) had the following aims:

- 1) Ascertain and improve current standards of pre-operative urine testing.
- 2) Understand staff perceptions towards current practices of urine testing.

All patients should have a urine dipstick within two weeks of urological surgery

Positive dipsticks (leucocyte and/or nitrite positive) are sent for culture

Positive cultures are treated with 5 to 7 days of antibiotics

Figure 1: Local guidance for pre-operative urine testing at RBH

MRN	AGE	OPERATION	DATE OF OP	DIPSTICK RESULT	CULTURE RESULT	ANTIBIOTICS PRE-OP	ANTIBIOTICS POST-OP
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Figure 2: data extraction table

Methods

In the first audit cycle surgical records were retrospectively analysed. 92 patients undergoing urological surgery were studied over a five-month period (September '23 to Jan '24). These patients spanned four operations: Transurethral Resection of the Prostate (TURP), Rezum, Holmium Enucleation of the Prostate (HOLEP) and Urethrosopic Stone Fragmentation (URS).

Data extracted was recorded in a spreadsheet (*figure 2*). For each patient the UD, UC and antibiotic therapies prescribed pre- and post-op were noted down.

Opinions of pre-operative nursing staff was captured via a survey. The survey used a rating scale to ascertain perceptions on how clear the pre-operative urine screening system was. It also explored confidence in high-risk patients with bacteriuria being highlighted and escalated for antibiotic therapy.

The intervention had two elements:

- Firstly, an online referral platform titled 'Urologist of the Day' was built into hospital software. This allowed patients with positive UCs to be escalated directly to the urologist oncall.
- Secondly a teaching session was setup to highlight the results of the first audit cycle and areas for targeted improvement.

In the second audit cycle data was recollected for patients having URS, TURP, Rezum and HOLEP in April '24. A survey was also redistributed to staff to assess impact of the new system for referral and the teaching session. .

Results

A summary of the patient characteristics can be found in *table 1*. 92 patients were studied pre-intervention and 31 patients were studied post-intervention.

The percentage of patients having a UD pre-operatively rose from 77.1% to 93.5%. From those with a positive UD, proportions of patients sent for UC was roughly equal. 28% of UCs returned positive in the first audit cycle whilst 33% of UCs were positive in the second audit cycle. Crucially, prior to the intervention, 5 of the 12 positive UCs went untreated. This improved to a 100% hit rate post-intervention where all 5 positive UCs were treated pre-operatively (*figure 3 and 4*).

From the initial survey of staff perceptions, 80% of staff had little or no clarity as to who a positive culture needed escalating to. 60% had little or no confidence in a positive culture being treated in time before surgery. In the second audit cycle there was an improvement in the average score staff gave on confidence and clarity in departmental practice. Average scores on confidence in positive UCs being treated rose from 2.6 to 3.9. Clarity on who a positive culture should be escalated to rose from 2.6 to 4.6 (*figure 5*).

	Pre-intervention	Post-intervention
Total patients	92	31
Average age (years)	68.2	61.3
URS	38	23
TURP	29	3
Rezum	17	3
HOLEP	18	2

Table 1: patient characteristics

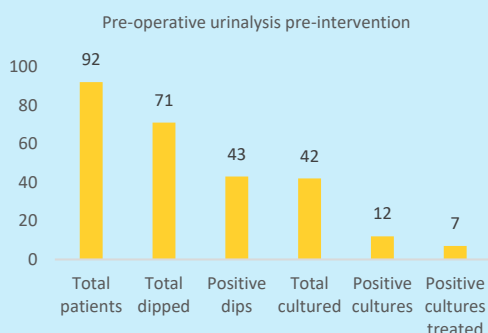


Figure 3 and 4: pre-operative urine testing pre/post-intervention

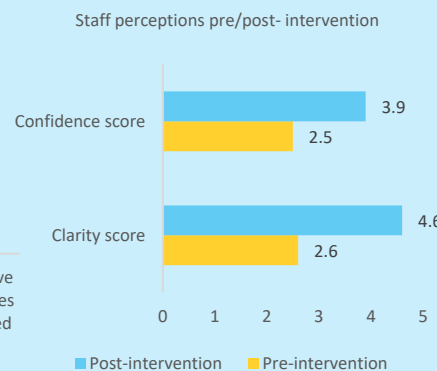
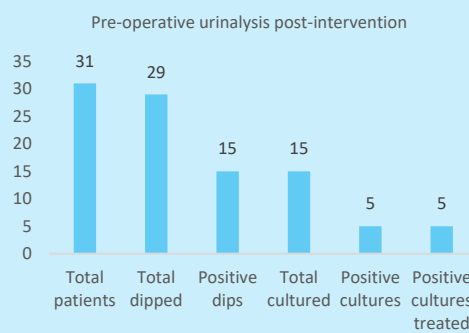


Figure 4: staff perceptions towards pre-op urine testing pre/post-intervention

Conclusion

This QIP showed that pre-operative urine testing at the RBH was failing in its ability to treat patients with bacteriuria prior to surgery. 5 out of the 12 positive UCs in the first audit cycle were left untreated: posing a significant infection risk. Staff survey indicate some reasons for this. Many pre-operative staff felt a lack of clarity on who to escalate a positive UC to. This fostered into a lack of confidence that a positive UC would be actioned.

The intervention homogenized the pathway for positive UCs to be escalated. Namely via an online referral system to the duty urologist. Theoretically this would remove the ambiguity on who would action a positive pre-op UC. It also provided a clear electronic trail and allowed positive samples to be triaged and deferred to a more convenient time for the on-call surgeon.

By streamlining and simplifying the referral process, all 5 positive UCs post-intervention were treated prior to surgery. The new referral process alongside the teaching session for pre-operative staff had a qualitative impact to. It boosted confidence nurses had in positive UCs being actioned and improved clarity on the local guidance.