

# CQUIN audit for prescription of antibiotics for urinary tract infections in an acute medical assessment unit

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## Abstract

Urinary tract infections (UTI) are a common presentation in a medical assessment unit, and we wanted to check compliance with hospital guidelines for antibiotic prescribing in patients presenting to hospital with urinary tract infection. The guidelines are based on local organisms and sensitivities. A retrospective audit of 40 patient records with positive urine cultures from July to August 2013 showed that 20% of patients with culture confirmed UTI were not given antibiotics at all. Of those prescribed antibiotics, 25% were non-compliant with local policy, and nearly one in two patients received more than one antibiotic. Furthermore, stop dates were not stated on 77% of the drug charts and duration of treatment ranged from one to 11 days.

Interventions were then introduced in the form of group teaching sessions, proactive checks by Trust pharmacists and widely distributed posters, and the same data sets collected for April to March 2014 to assess for efficacy of the interventions. On re-auditing, 35% patients were not prescribed any antibiotics. However, compliance with local policy was 100%, including 100% drug charts having a stop/review date stated. The overall duration of treatment now ranged from one to seven days, and fewer than one in four patients had more than one antibiotic.

Our results showed that improvement was needed in antibiotic stewardship, in particular with regards to compliance with the local guidelines and documentation of prescription. We have demonstrated that it is possible to improve compliance through teaching, by displaying information prominently, and vigilance by the clinical team. The outcome of this is a decreased number and duration of antibiotics prescribed, which has benefits for the patients, the hospital, and the community as a whole. Further work would include interventions to improve the number of patients who are missing antibiotic prescriptions altogether.

## Problem

We needed to assess whether urinary tract infections (UTIs) presenting on an acute medical assessment unit in a district general hospital were being treated with antibiotics that complied with hospital guidelines, which are based on local bacterial prevalences and sensitivities. Non-compliance can lead to inappropriate duration of treatment, requirements for further course of different antibiotics, increased length of stay, and ultimately increased morbidity and mortality.

## Background

Urinary tract infections (UTIs) are a common diagnosis in medical admissions unit. NHS Choices states that around half of all UK women will have a UTI at least once in their lives and one in 2000 healthy men will have one at least once a year.[1] There is a higher mortality and morbidity associated with UTIs in critically ill patients,[2,3] and it is important that UTIs are treated promptly and adequately.

Moreover, numerous studies have shown an increasing resistance to several common antibiotics; of note in 2001 the first international survey of prevalence and susceptibility of organisms causing uncomplicated UTIs in the community (ECO-SENS Project), found that 42% E. coli isolated (accounting for 77% of pathogens cultured)

was resistant to one or more of the more common antibiotics.[4] The microbiology departments of hospital Trusts develop guidelines on first and second line antibiotics to treat infections based on local organisms and sensitivities.

## Baseline measurement

We collected retrospective data from the lab for urine samples with positive culture results during the period of July to August 2013. There was a total of 115 patients, 40 of whom were inpatients on the medical assessment unit (MAU); we processed all the data, and looked specifically at the data for MAU.

We recorded the following outcomes for each patient: which antibiotics were given, the number of antibiotics given, compliance with microbiology guidelines (as per Milton Keynes General Hospital Antibiotic Guidelines 2012), whether the organisms were sensitive to the guideline antibiotics, and whether the duration and stop/review dates were being correctly recorded.

Our results showed that of patients with culture-positive UTI, 20% were not given antibiotics at all. Of those prescribed antibiotics, 25% were not compliant with local policy, and nearly one in two patients received more than one antibiotic. In addition, stop dates were not stated on 77% of the drug charts and duration of treatment ranged from one to 11 days. All organisms were 100% sensitive to antibiotics given.

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See supplementary file: ds5016.pptx - "CQUIN UTI audit- initial results"

### Design

The problems were discussed members of the multi-disciplinary team, which included medical staff, microbiology, and pharmacists. It was agreed that as a first step to improving outcomes, re-iteration of the guidelines was needed. This would be achieved in the form of education, which would involve group teaching. The group teaching would be incorporated as part of junior doctor teaching, and the full audit cycle was presented at local audit meetings and grand rounds which were attended by more senior doctors. It was key to achieve widespread dissemination of information. Thus, we were able to provide clear and unambiguous information for clinicians and other multidisciplinary staff, regardless of grade.

To ensure consistent and reliable prescriptions, we created a poster with a flowchart that gave a clear process for prescribing antibiotics and following up results of investigations prior to discharge. This was put up in acute clinical areas as a cost-effective way to present information. In addition, the pharmacists conducted regular antibiotic checks on the drug charts, drawing the medical team's attention to prescriptions which did not comply with the guidelines, or did not have a stop/review date.

### Strategy

PDSA cycle 1: Case records were reviewed to record whether antibiotics prescribed for a UTI were compliant with guidelines, and we found that compliance was not 100%, that several antibiotics were used, documentation was poor, and furthermore that 26% patients had not received any antibiotics at all for a positive urine culture. We felt that the causes of this included poor knowledge of the local antibiotic guidelines and lack of understanding of the importance of appropriate antibiotic prescription and documentation. Group teaching was a key intervention provided to several members of the multi-disciplinary team, and a poster to reinforce the guidelines was put up in clinical areas.

PDSA cycle 2: A re-audit of case records from a similar period of time was done after the intervention. Compliance had improved to 100% and documentation had also improved. However, there was no improvement in the number of patients who were not prescribed any antibiotics at all as expected. The focus of the next intervention would be on improving this last outcome, creating a more tangible form of communication (ie a sticker in the notes with a checklist) about whether a urine sample had been taken and sent off to the lab, prompting the medical team both to prescribe antibiotics and to chase the culture results.

### Results

We collected the data from positive urine cultures for March to April 2014 from a total of 22 patients and recorded the same criteria.

The results showed 35% patients were not given any antibiotics at

all, however: stop/review dates were on 100% of the drug charts, the overall duration of treatment ranged from one to seven days, and now fewer than one in four patients had more than one antibiotic. The antibiotic compliance to guidelines was 100%.

See supplementary file: ds5017.pptx - "CQUIN UTI re-audit results"

### Lessons and limitations

Our audit has demonstrated the effect of clear and unambiguous information regarding antibiotic guidelines in prominent places and through different media can improve compliance with antibiotic prescription. There were problems associated with our interventions however; while we had found a significant improvement in compliance with the antibiotics prescribed, we had not yet succeeded in reducing the number of patients who had failed to be prescribed any antibiotics at all (20 to 35%).

The focus of our audit was limited to the acute medical assessment unit, however it is clear that appropriate antibiotic prescription is an issue shared by many different specialties and departments. Further work and resources are required to access these areas, where we should be urging them to understand the benefits of adequate prescription from an individual patient basis, financial basis, and also in the scheme of antibiotic stewardship.

In addition, there is a high turnover of staff, particularly medical staff, on a yearly, six-monthly, or even a weekly basis, each bringing their own knowledge and experience of antibiotic prescription from working in previous hospital trusts. This provides an extra challenge with trying to maintain a working knowledge of the local guidelines of this trust in question.

Our data collection was also limited by the logistics of patient records; being a retrospective study, we were reliant on old records scanned onto our computer-based archive system, which became problematic when documentation had not been scanned in/was missing, or had not adequately recorded in the first. While it is not possible to alter the fact that some documentation will not be scanned in, this highlights the significance of adequate documentation by the healthcare professionals in order to provide a comprehensive record of a patient's acute admission.

### Conclusion

The interventions we introduced appeared to have dramatic results over a short space of time, with an improvement of compliance with the antibiotic guidelines to 100% and also documentation improving to 100% accuracy. This shows that clear communication with relevant information via the media of group teaching, multi-disciplinary involvement, and posters can be effective in improving clinical practice in antibiotic stewardship. Further work needs to be done to access the hospital as a whole, and also to sustain the practice beyond the current intake of staff due to the natural high turnover. We also need to introduce interventions to reduce the number of patients not receiving any antibiotics at all, either through being missed by mistake or a positive culture not being identified. A

sticker in the notes or working more closely to improve communication with the microbiology department might improve this. Subsequent re-auditing would evaluate the success of our interventions.

Ultimately it is important that antibiotic stewardship is improved for various reasons, among which there is an associated higher mortality with urinary tract infections, in particular with catheter-related infections,[5] and also a growing problem with antibiotic resistance [4] and reducing number of available options. Therefore it should be regarded as good medical practice to ensure appropriate antimicrobial treatment is being administered to patients in our care at all times, and is a duty of all members of the multi-disciplinary team.

## References

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## Declaration of interests

Nothing to declare.

## Acknowledgements

Clinical leads and supervisor respectively: Dr. Lakshmi Raganathan (Consultant microbiologist), Dr. John Northfield (acute medicine consultant).

## Ethical approval

According to the Policy on ethical approval as this work is deemed an improvement study and not a study on human subjects, and it is also for application on a local basis, ethical approval is not required