

Urinary Tract Infection (UTI) Quality Assurance Follow Up
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SCOPE:

To repeat the Quality Assurance (QA) project that was done over 3 prior 6 month periods, and look at all patients seen over the next 6 month period:

1. with UTI symptoms
2. with urine dips or urine cultures sent
3. who were treated for a UTI

METHOD:

Using the electronic health record, Pyramed, all charts with a diagnosis of urinary frequency, UTI, cystitis and dysuria, were reviewed. This QA had already been completed every 6 months from April 20, 2007 – October 30, 2008. It was repeated for the date range November 1, 2008 – April 30, 2009.

Domains to be looked at were diagnosis assigned, symptoms described by the patient, results of urine dip, urine culture results, antibiotics prescribed, and whether antibiotics were prescribed on the basis of symptoms, urine dip or urine culture results. All paper charts were pulled and reviewed if the urine dip result was not documented in the Electronic Health Record.

The results were then compared to the results from the prior three 6 months to assess if the practice changes had any impact, and if further changes were necessary.

RESULTS:

1. Diagnoses/Urine Dips/Cultures

A total of 79 diagnoses of urinary frequency, UTI, cystitis and dysuria were given from November 1, 2008 to April 30, 2009. This does not include 10 patients who were evaluated with UTI symptoms by telephone consults after hours. This number of telephone requests is consistent with the usual number we receive over a 6 month period. They have been excluded from further analysis.

These 79 visits to SHS corresponded to a total of 75 patients being seen; 71 were only seen once over this 6 month period, 4 were seen twice, and none had more than 2 visits.

Of the 79 visits, all 79 had urine dips checked.

Of the 79 visits, 37 had no cultures sent. 42 cultures were sent in total.

Table 1:

	4/20/ 07 – 10/31/ 07	11/1/ 07 – 4/30/ 08	5/1/08 – 10/31/08	11/1/08 - 4/30/09
Total number of visits	91	87	96	79
Number of urine dips	86 (95%)	75 (86%)	96 (99%)	79 (100%)
Number of urine cultures	83 (91%)	53 (61%)	61 (64%)	42 (53%)

Table 1 shows that over the initial three 6 month periods, the total numbers of visits for UTI symptoms were comparable. In the latest 6 month period, the number of UTI visits decreased. We will have to monitor this to see if the education that the students have been getting has impacted this decrease in visits.

Using the practice changes introduced in 2008, we are now doing urine dips on everyone presenting with UTI symptoms. Using previous practice changes, we had significantly reduced the number of urine cultures sent – from 91% to 61-64%. Using stricter clinical guidelines in the latest 6 month period, we have reduced the number of cultures sent even further, to 53%.

2. No growth cultures:

Of the 42 cultures sent, 19 had no growth. Of these, 4 patients were treated with antibiotics. Of this group, only 1 patient with a negative urine dip was treated with antibiotics (as she described significant symptoms and had just completed a course of antibiotics). Of the 3 other patients treated with antibiotics, none had urine dips which only had blood on them.

For the 4 no growth cultures that were treated with antibiotics, patients described anything from 1 symptom to several, and dips had any range of LE only or LE and blood on them. None of the cultures that had no growth had dips that were positive for nitrites.

Of the 19 no growth cultures, 7 of them had either a negative dip or blood only.

Table 2:

	4/20/ 07 – 10/31/07	11/1/07 – 4/30/08	5/1/08 – 10/31/08	11/1/08 – 4/30/09
No growth culture	32 (38%)	24 (45%)	30 (49%)	19 (45%)
Antibiotic treatment	18 (56%)	12 (50%)	7 (23%)	4 (21%)

Table 2 shows that the total number of no growth cultures has remained stable. However, the number of patients with a negative culture who were treated with antibiotics has decreased significantly from over 50% to 21%.

3. Positive cultures:

23 patients grew out 1 or more organisms on their cultures. 15 of these had E.Coli (65%). Of the 15 E. Coli UTI's, only 1 was bactrim-resistant (7%).

Table 3:

	4/2/07 – 10/31/07	11/1/07 – 4/30/08	5/1/08 – 10/31/08	11/1/08 – 4/30/09
Positive Cultures	50	27	31	23
E. Coli	31 (62%)	21 (78%)	22 (71%)	15 (65%)
Bactrim Resist. E. Coli	6 (19%)	7 (33%)	4 (18%)	1 (7%)

Table 3 shows that the number of cultures sent decreased since this QI was instituted. The number of bactrim resistant E. Coli infections has decreased. However, due to practice changes, many of the patients who are assumed to have an E. Coli UTI (those with nitrite positivity or highly positive dipsticks) are not having cultures sent, so this number is probably an underestimate of true bactrim resistance.

Table 4:

	4/20/07 – 10/31/07	11/1/07 – 4/30/08	5/1/08 – 10/31/08	11/1/08 – 4/30/09
Positive Cultures	50	27	31	23
Immediate Antibiotics	41	18	22	17
No Immediate Antibiotics	9 (18%) 5 treated after cx results came back 4 resolved without Rx	9 (33%) 4 treated after cx results came back 5 resolved without Rx	9 (29%) All 9 treated after cx results came back	6 (26%) 4 treated after cx results came back 2 resolved without Rx

Table 4 shows that of the 23 positive cultures, 17 patients were treated with antibiotics at initial presentation. 6 patients with positive cultures were not initially treated with antibiotics. In all these cases the patient either had minimal symptoms or a urine dip with only blood or minimal LE. Of these 6 cultures, 4 had greater than 10,000 kcol E. Coli, 1 had 25-50,000 kcol Group B Streptococcus and 1 had 25-50,000 kcol Klebsiella. After the cultures came back positive, all patients were contacted and all were treated with appropriate antibiotics. None of the patients developed any adverse effects from waiting for treatment.

4. Nitrite positive dipsticks:

13 patients had urine dips that were positive for nitrite. Of these, all 13 were initially started on cipro. No patients in this group reported any adverse events, and none returned with symptoms.

5. Adverse Events:

No patients during this period were treated for pyelonephritis, either initially or after not being given antibiotics immediately at presentation per the protocol. No patients required ER visits or hospitalization. No patients reported any medication allergies or side effects.

6. Antibiotic Use:

Of the 79 visits, 1 received an immediate prescription for bactrim, 44 for cipro, 5 for macrobid, and 32 received no immediate prescription.

Table 5:

	4/20/07 – 10/31/07	11/1/07 – 4/30/08	5/1/08 – 10/31/08	11/1/08 – 4/30/09
Bactrim	42	42	12	1
Cipro	13	16	35	44
Macrobid	5	6	5	2
Other	5	0	1	0
Total # of prescriptions	65 (71% of visits)	64 (74% of visits)	53 (55% of visits)	47 (59% of visits)
No immediate prescription	25	22	43	32

Table 5 shows that following the protocol changes before the 3rd sample, we decreased significantly the number of immediate prescriptions given, from 74% of visits getting immediate antibiotics, to 55%, and this stayed relatively stable during this 4th sample at 59% of all patient visits getting antibiotic prescriptions. We are now using mainly cipro given the change in our recommendation for use as a first line antibiotic.

Table 6:

	4/20/07 – 10/31/07	11/1/07 – 4/30/08	5/1/08 – 10/31/08	11/1/08 – 4/30/09
Antibiotics switched or added due to bactrim resistance	3	7	1	0
Antibiotics added after positive culture	5	4	9	4
Antibiotics changed because of allergic reaction	2	1	0	0
Antibiotics given when culture was negative	18	13	7	5

Table 6 shows with the use of cipro or nitrofurantoin as a first line treatment, we are not having to switch patients due to bactrim resistance. In the 3rd sample, we saw a downside of starting fewer people on antibiotics immediately in that more had to be started on antibiotics once cultures came back positive than previously. However, with the slight

adjustments in procedure, we are again maintaining a low number of patients having to be started on antibiotics who were not initially treated with subsequent positive cultures.

The total number of patients treated with antibiotics in the latest sample was 47. Of these, 31 did not have cultures sent per the SHS protocol, 11 had E. Coli on culture, 1 had a low growth mixed, and 4 had negative cultures.

FOLLOW UP FROM PRIOR QA:

The 3 main areas to be evaluated were:

1. Number of cultures being sent:
 - a. With the practice changes instituted after the first QA, this number was reduced from 91% of visits to 61% and 64%, and then with additional changes to the protocol has been further reduced to 53%.
2. Number of antibiotic prescriptions being written.
 - a. The number of antibiotic prescriptions written at presentation decreased from 71% of all visits to 59% of all visits.
 - b. Fewer antibiotics were given to patients when the urine culture was subsequently negative (reduced from 56% to 21%).
 - c. In this 4th series there has been no increase in the number of antibiotics that were added after positive cultures came back (stable at 5% of patients, was only increased in the 3rd series at 9%).
3. Antibiotic Resistance.
 - a. Having seen an increase in bactrim resistance to 33% after the first 2 series, our first line antibiotic was changed to cipro. We have not seen any cipro resistance thus far.

DISCUSSION:

At SHS with our protocol changes, we are now not only starting significantly fewer patients on antibiotics, we are also sending significantly fewer cultures. Subsequently, fewer patients with no growth cultures are being treated with unnecessary antibiotics. This gives both an economic saving and will help reduce the occurrence of antibiotic resistance. We will continue to monitor the number of cultures sent and our antibiotic prescription use using the same protocol.

Because of our more stringent policy on antibiotic prescribing, some UTIs were not treated with antibiotics at presentation. However, no serious adverse events occurred to these patients, and those who were still symptomatic were all started on appropriate antibiotics when the culture results became available. We will continue to monitor the number of positive cultures that were not immediately treated with antibiotics.

We have not seen any cipro resistance in our sample, but need to monitor our resistance pattern closely over the upcoming years. We will continue to use cipro or nitrofurantoin as first line treatment for now.