Attacking Urine Contamination: System-Wide Engagement and Standard Work Drives a 20% Average Rate to a Sustained 5% Goal

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Background

Baylor Health Care System

- 2.8 million patients come to Baylor’s 370+ access points each year across the DFW Metroplex
- 31 owned/operated/ventured/affiliated hospitals
- 28 joint-vented ambulatory surgical centers
- 409,375 ED visits FY’12
- 122,007 Admissions FY’12
- 53,787 total urine cultures performed FY’13 from 9 main BHCS hospitals
Inappropriate reporting of UC results leads to:

- Inadequate therapy and prolonged patient stays
- Poor patient outcomes and unnecessary treatment
- Increased cost

It is cost prohibitive working up contaminated urines

- BD estimates $ 900 increase per contamination
- Treatment of false positives may not get reimbursed
- Inefficient use of time for testing personnel

Recollections lead to decreased patient satisfaction and delay of treatment

Process Towards Improvement

1. Identification of Issue
2. Analysis of Problem
3. Solutions Implemented
4. Outcome
• We didn’t know we had an issue
• Most locations were not measuring UCCR . . . most of focus was on BCCR
• Notified by reference laboratory in early 2012 that BHCS as a whole had a urine contamination problem
• UCCR July 2011
  – 3 Facilities: > 30%
  – 5 Facilities: > 21%
  – BHCS Ave: 27.6%
In May 2010, 8 BHCS facilities transitioned microbiology testing to centralized reference lab (med fusion).

Remaining facility transitioned micro testing June 2011.

Highly collaborative relationship between med fusion and BHCS on best practices.
BHCS UCCCR Variation

Data: Jul’11 – Feb’12

GAR 28.1%
BAS 23.3%
WAX 21.5%
GRP 20.4%
PLA 20.4%
IRV 19.3%
BUMC 16.1%
THHBP 10.1%
BHVH 8.1%
BHCS Ave 20.6%
Process Towards Improvement

Identification of Issue

Analysis of Problem

Solutions Implemented

Outcome
Group Effort

• Multi-Hospital PI team focused on reducing UCCR
• Team led by Baylor WAX Director
• Each facility had representative on team
• Project:
  – Identify best process for collection, preservation, transportation to hospital lab and reference lab
• Surprisingly not much out there
• Most referenced articles are two CAP Q-Probe studies
CAP Q-Probe (2008)

Key Findings
- Collection site had no influence
- Refrigeration had significant effect
- Verbal instructions lowered male only
- Written instructions lowered both

UCCR
- 75\textsuperscript{th} %ile: 4.2 %
- 50\textsuperscript{th} %ile: 15.0 %
- 25\textsuperscript{th} %ile: 26.7 %
- 10\textsuperscript{th} %ile: 41.7 %

BHCS Ave
- 27.6 %
Contamination Definition

CAP Q-Probe (2008)

“A urine specimen was determined to be contaminated if the culture yielded more than 2 isolates in quantities greater than or equal to 10,000 CFU/mL.”
Contamination Definition Variation

4 BHCS Hospitals
- Used Q-probe & med fusion definition

4 BHCS Hospitals
- Did not have a definition or collect UCCR data

1 BHCS Hospital
- Used own policy definition different from Q-probe/med fusion
Refrigeration of Urine at Point of Collection

CAP Q-Probe: “refrigeration most statistically significant factor affecting UCCR”

• Placing refrigerators at POC is problematic
  – Monitoring temperatures
  – Units not using refrigerators
  – Forgetting specimens in refrigerator
  – Lack of space for placement
  – Cost
Other Issues Causing UCCR Problems

• No standardized processes for collection, preservation, and transport on units
• Some units would hold urine specimens on floor for long time
• Some BHCS facilities not using collection kit
• Some BHCS facilities would transfer to preservative tube in lab, others would send original container to reference lab
• Delay in sending specimens to reference lab
Process Towards Improvement

Identification of Issue

Analysis of Problem

Solutions Implemented

Outcome
Urine Culture Collection Kit

- Each facility standardized to same BD Urine Culture Collection kit
- Kits deployed to units
Urine Culture Collection Kit

- Simplified urine collection for nursing partners
- Allowed for aliquotting into preservative tube at point of collection
- Eliminated need for:
  - Pour-offs
  - Relabeling
  - Refrigeration
Urine Culture Collection Kit

Safety Concerns

• Eliminated potential for spills
• Reduced chances of specimen exposure to staff
• Potential for needle stick on cap of container
• Posted collection instruction in each bathroom in ED

• Had more detailed poster, but removed due to family concerns
Instructions for Females

1. Wash hands with soap and warm water.

2. Spread the labia (folds of skin) apart with one hand and wipe with the towelette provided. Wipe from front to back.

3. Continue holding the labia apart. As you start to urinate, allow a small amount of urine to fall into the toilet bowl. This clears the urethra of contaminants.

4. Do not touch the inside of the cup.

5. After the urine stream is well established, urinate into the cup. Once an adequate amount of urine fills the cup remove the cup from the urine stream. The cup only needs to be half-full.

6. Pass the remaining urine into the toilet.

7. Screw the lid on the cup tightly and do not touch the inside of the cup or lid. Give the cup to the Nurse, Technician, or Healthcare provider.
Instructions for Males

1. Wash hands with soap and warm water.
2. If uncircumcised, retract foreskin.
3. Wipe the end of the penis with the towelette provided. As you start to urinate, allow a small amount of the urine to fall into the toilet bowl. This clears the urethra of contaminants.
4. Do not touch the inside of the cup.
5. After the urine stream is well established, urinate into the cup. Once an adequate amount of urine fills the cup remove the cup from the urine stream. The cup only needs to be half-full.
6. Pass the remaining urine into the toilet.
7. Screw the lid on the cup tightly and do not touch the inside of the cup or lid. Give the cup to the Nurse, Technician, or Healthcare provider.
Provided training and education material to each unit on proper use of Urine Collection Kit.

| ![Image of soap towelette](soap_towelette.png) | Used to clean patient prior to urine collection (for information on proper patient cleansing refer to the instructions for collecting a mid-stream clean catch urine sample.) |
| ![Image of main urine collection container](main_collection_container.png) | Patient Specimen is collected directly into this primary container which can be used for urinalysis testing, Drug of Abuse testing, urine chemistry testing. |
| ![Image of grey top tube](grey_top_tube.png) | Immediately after collection, urine from the main cup is transferred into this tube which is used for the urine culture. |

**Urine Culture Collection Kits**
We standardized to the CAP Q-Probe (2008) definition of: 

“A urine specimen was determined to be contaminated if the culture yielded more than 2 isolates in quantities greater than or equal to 10,000 CFU/mL.”
# Unit Specific Dashboard

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• Set UCCR aspiration goals for each facility and BHCS

• CAP Q-Probe (50th): 15.0 %
• BHCS Baseline: 20.6 %
• Meets Expectations: ≤ 10 %
• Exceeds Expectations: ≤ 5 %
• med fusion Collaboration on UC reporting improvements
  – Eliminated a potential delay point in the process, allows reporting of urine cultures as close to first-in, first-out as possible.
  – Negative cultures on non-invasively collected urine samples (i.e., clean catch, foley catheter, and pediatric bags) reported final after 24 hours of incubation. Previously, cultures were evaluated on each shift, with cultures being finalized anywhere between 32-50 hours.
  – Urine samples collected via invasive procedures (i.e., Supre-pubic, straight catheter, Cystoscopy, and Nephrostomy) are held for 48 hours.
Process Towards Improvement

Identification of Issue

Analysis of Problem

Solutions Implemented

Outcome
BHCS UCCR Initial Improvements

Bar chart showing improvements from July 2011 to February 2012 compared to March 2012 to June 2012 for BHCS, GAR, BAS, WAX, GRP, PLA, IRV, BUMC, THHBP, and BHVH.
Reassessed Issues/Solutions in June 2012

Findings:

- About 20-25% units not using UC Collection kit
- Grey tubes not being filled to the minimum volume (3mL)
- Urine Culture Add-on testing impact
New Solutions

• Implemented specimen rejection criteria when:
  – units don’t use UC Collection kit
  – grey tubes not being filled to the minimum volume (3mL)

• Some facilities report to Safety/Quality committee unit outliers

• Implemented in ED only that all urine testing be collected using UC Collection kit
BHCS UCCR Results

- Notified of UCCR Issue
- 1st round Solutions Implemented
- 2nd round Solutions Implemented

FY'12
FY'13
FY'14
Two New BHCS Facilities

- Baylor McKinney opened July 2012
- Baylor Carrollton started June 2013
- Implemented established processes during their roll-out

**Baylor McKinney**

- FY’13: 3.1%
- FYTD’14: 1.3% (-74.0%)
- BHCS Goal: 5.0%

**Baylor Carrollton**

- FY’13: 1.7%
- FYTD’14: 2.3% (-54.0%)
- BHCS Goal: 5.0%
Changing Mindsets and Behaviors

Remove pessimism with a fact base
- Display performance metrics
- Huddle around the metrics with staff
- Drive to solutions from the team and implement
- Test if staff implemented the teams ideas

Efficient and effective movement of people and information through a system
- Define who does what, when
- What are the triggers for activities to occur
- Incorporate the lean levers into the process flow

Optimize the management infrastructure

Develop the mindsets & behaviors

Improve the operating system

SOURCE: McKinsey Operations Practice

Making sustainable change requires simultaneously executing against three key elements with equal vigor

Change the mindset that drive workplace behaviors
- Change mindsets with daily huddles
- Emphasize importance of the process with weekly or twice weekly meetings to drive changes
- Reward team for successes
Summary

Issues

We didn’t know we had a problem

Significant variation in processes at each BHCS facility

Changing mindsets and behaviors

Solutions

• Started receiving monthly reports of each facilities UCCR
  • Set aggressive system goal targets and monitor progress

• Deployed multi-facility performance improvement team
  • Standardized process for urine collection, preservation and transportation

• Rolled out education training to units
  • Shared hospital and unit specific data
  • Implemented rejection criteria