

Attacking Urine Contamination:

**System-Wide Engagement and Standard Work
Drives a 20% Average Rate to a Sustained 5% Goal**

Joseph Baker, MT (ASCP), MSHA
Director Laboratory Services
Baylor All Saints Medical Center

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-ventured 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

Why Improve UCCR?

- Inappropriate reporting of UC results leads to:¹
 - Inadequate therapy and prolonged patient stays
 - Poor patient outcomes and unnecessary treatment
 - Increased cost
- It is cost prohibitive working up contaminated urines²
 - 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

1. Bekeris LG, Jones BA, Walsh MK, Wagar, EA. Urine culture contamination: A College of American Pathologists Q-probes study of 127 laboratories. *Arch Pathol Lab Med.* 2008;132(6):913-917.

2. http://www.bd.com/vacutainer/pdfs/urine_value_story_VS8999.pdf

Process Towards Improvement

Identification of Issue

Analysis of Problem

Solutions Implemented

Outcome

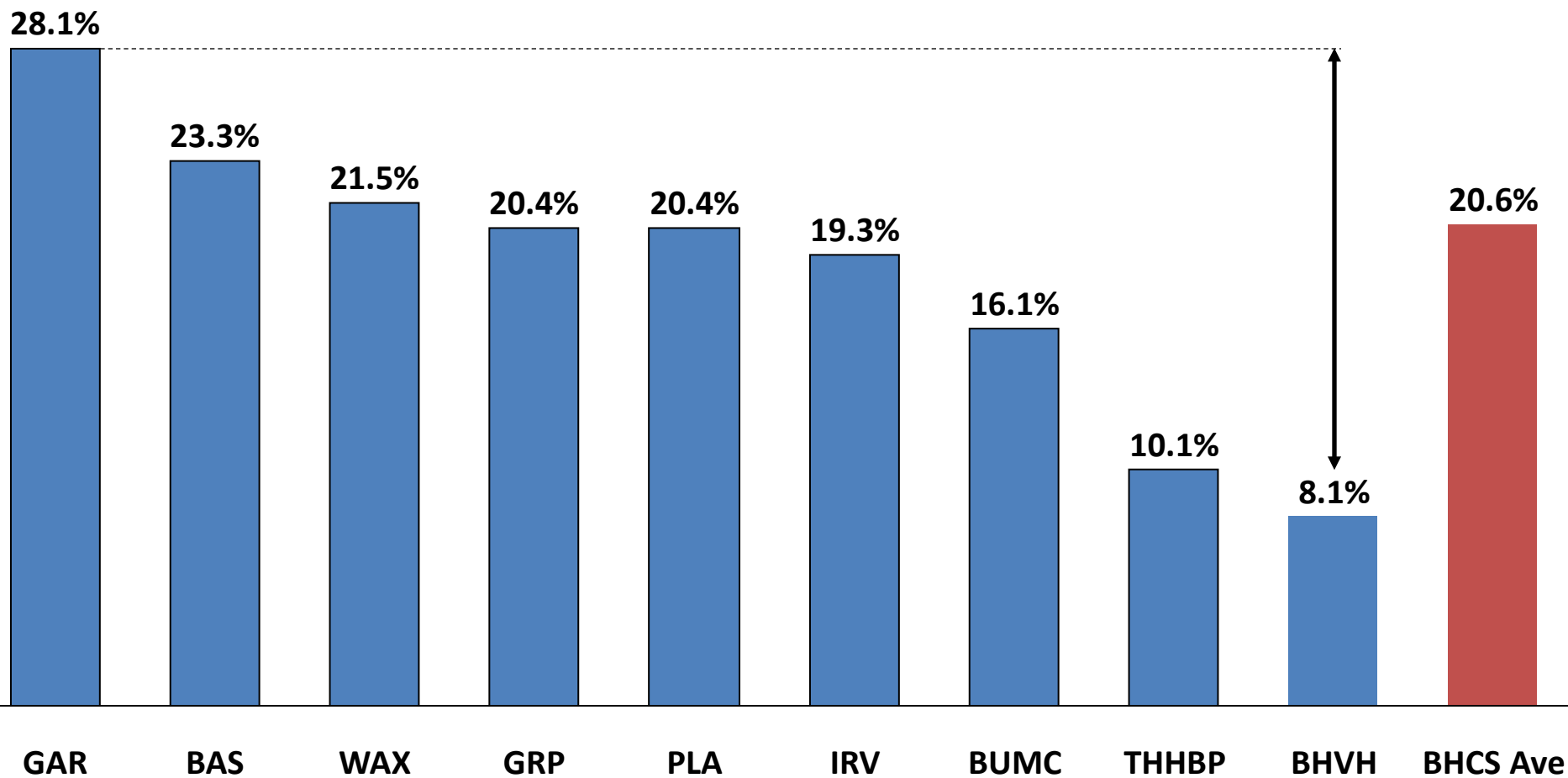
Identification of Issue

- 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 UCCR Variation

Data: Jul'11 –
Feb'12



Process Towards Improvement

Identification of Issue

Analysis of Problem

Solutions Implemented

Outcome

- 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
 - Bekeris LG, Jones BA, Walsh MK, Wagar, EA. Urine culture contamination: A College of American Pathologists Q-probes study of 127 laboratories. *Arch Pathol Lab Med*. 2008;132(6):913-917
 - Valenstein P and Meier F. Urine culture contamination: A College of American Pathologists Q-Probes study of contaminated urine cultures in 906 institutions. *Arch Pathol Lab Med*. 1998;122(2):123-129.

Key Findings

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

UCCR

• 75 th %ile:	4.2 %	
• 50 th %ile:	15.0 %	BHCS Ave
• 25 th %ile:	26.7 %	27.6 %
• 10 th %ile:	41.7 %	

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



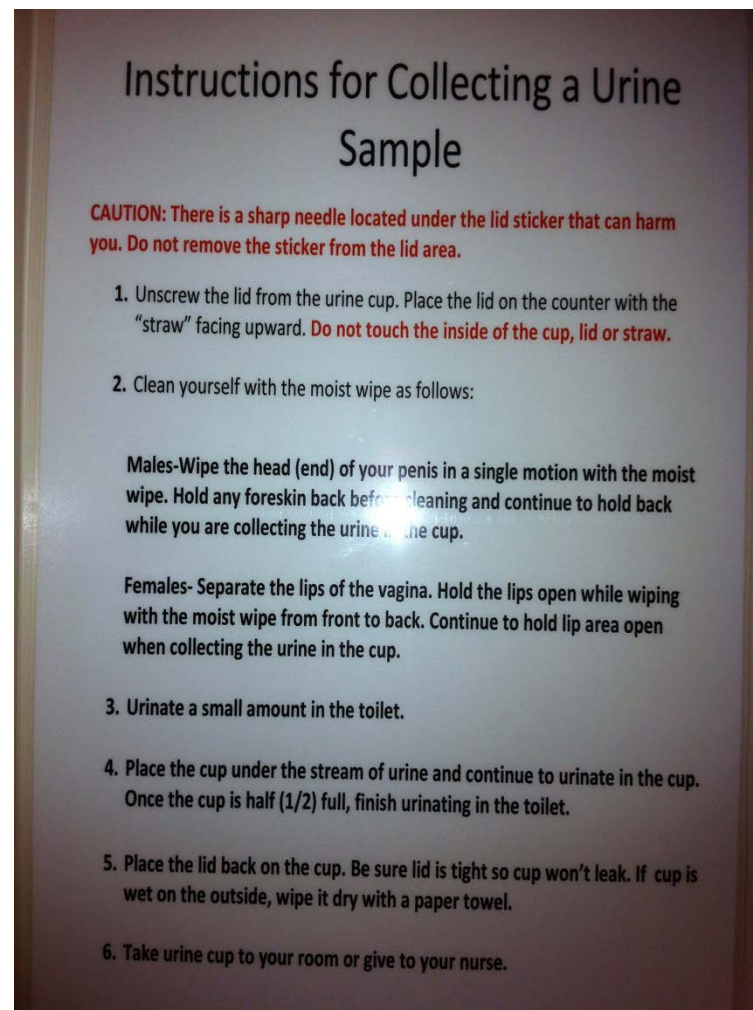
- Simplified urine collection for nursing partners
- Allowed for aliquotting into preservative tube at point of collection
- Eliminated need for:
 - Pour-offs
 - Relabeling
 - Refrigeration

Safety Concerns

- Eliminated potential for spills
- Reduced chances of specimen exposure to staff
- Potential for needle stick on cap of container

Posting Collection Instructions

- Posted collection instruction in each bathroom in ED
- Had more detailed poster, but removed due to family concerns



Written Collection Instructions - Females

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.**

Written Collection Instructions - Male

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

Urine Culture Collection Kits		
soap towelette		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.)
Main Urine collection Container		patient Specimen is collected directly into this primary container which can be used for urinalysis testing, Drug of abuse testing, urine chemistry testing.
Grey top tube		Immediately after collection, urine from the main cup is transferred into this tube which is used for the urine culture.

Standardized Contamination Definition

- 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

Location	May 2013			June 2013			YTD		
BASMC	Total URNC COL	# URNC Contam	% URNC Contam	Total URNC COL	# URNC Contam	% URNC Contam	Total URNC COL	# URNC Contam	% URNC Contam
AMA4	63	1	1.6%	70	1	1.4%	834	23	2.8%
AMA7	48	3	6.3%	51	4	7.8%	670	26	3.9%
AMA8	76	1	1.3%	88	3	3.4%	998	38	3.8%
AMB2N	14	0	0.0%	9	0	0.0%	130	5	3.8%
AMB2S	54	2	3.7%	42	1	2.4%	506	20	4.0%
AMB3N	11	0	0.0%	13	0	0.0%	142	6	4.2%
AMB3S	26	1	3.8%	26	0	0.0%	259	4	1.5%
AMB4N	32	0	0.0%	27	7	25.9%	420	17	4.0%
AMB4S	5	0	0.0%	37	1	2.7%	306	13	4.2%
AMC5	67	4	6.0%	78	6	7.7%	785	37	4.7%
AMCVI	13	0	0.0%	17	3	17.6%	206	11	5.3%
AMICU	11	0	0.0%	18	0	0.0%	214	5	2.3%
AMED/AMER	208	12	5.8%	169	13	7.7%	1789	100	5.6%
AMOPN	17	0	0.0%	13	0	0.0%	283	7	2.5%
AMPAC	6	0	0.0%	3	0	0.0%	37	1	2.7%
AMW2N	6	0	0.0%	8	0	0.0%	80	1	1.3%
AMW3N	2	1	50.0%	2	0	0.0%	30	2	6.7%
AMW3S	0	0	#DIV/0!	1	0	0.0%	22	2	9.1%
AMW4N	1	0	0.0%	1	0	0.0%	17	2	11.8%
AMTS	33	1	3.0%	32	0	0.0%	401	25	6.2%
AMWTR	14	0	0.0%	15	0	0.0%	181	10	5.5%
AVITA	6	0	0.0%	12	1	8.3%	103	5	4.9%
Total	734	26	3.5%	747	40	5.4%	8413	360	4.3%

- 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

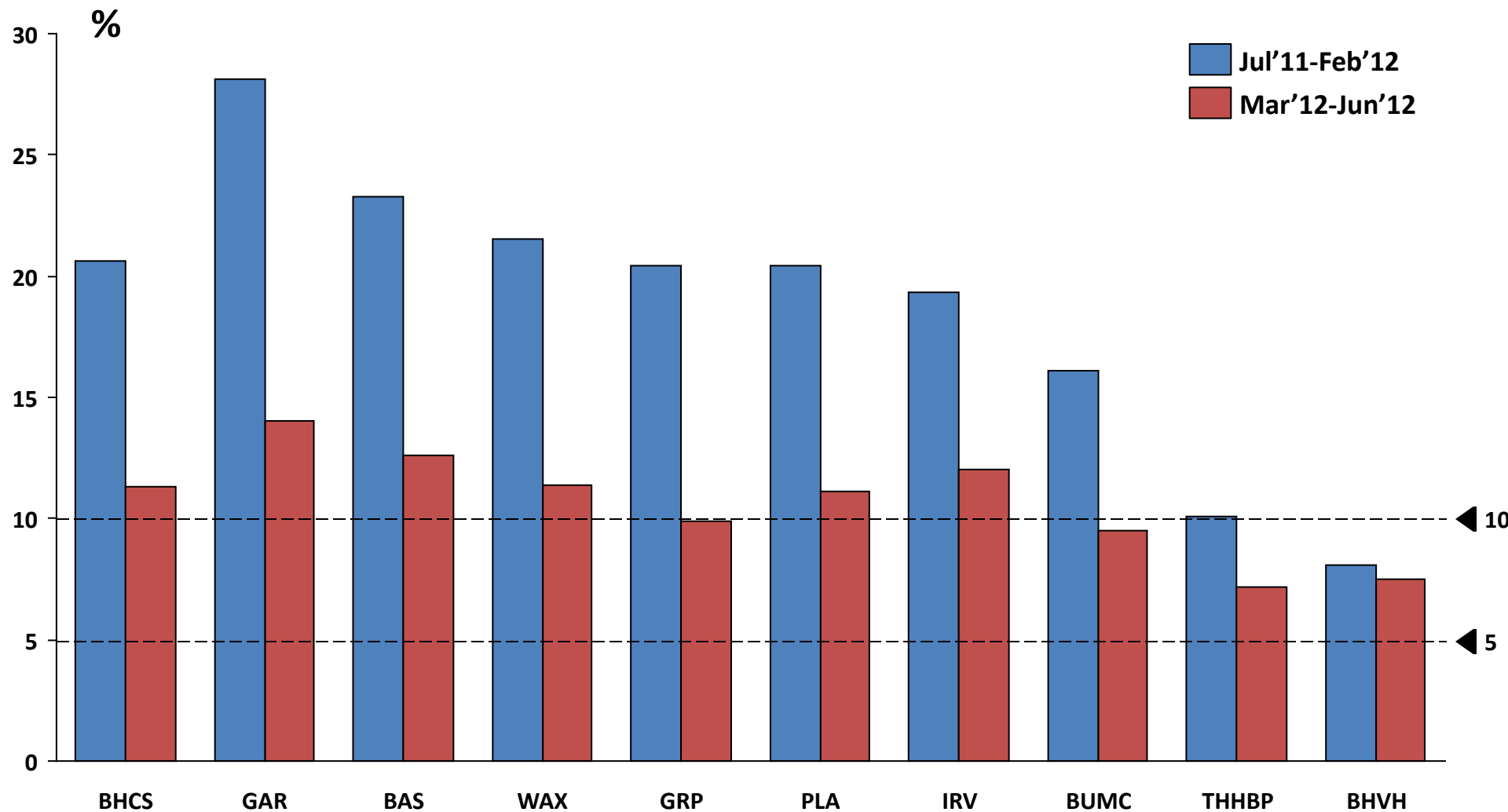
Identification of Issue

Analysis of Problem

Solutions Implemented

Outcome

BHCS UCCR Initial Improvements



Reassessed Issues/Solutions in June 2012

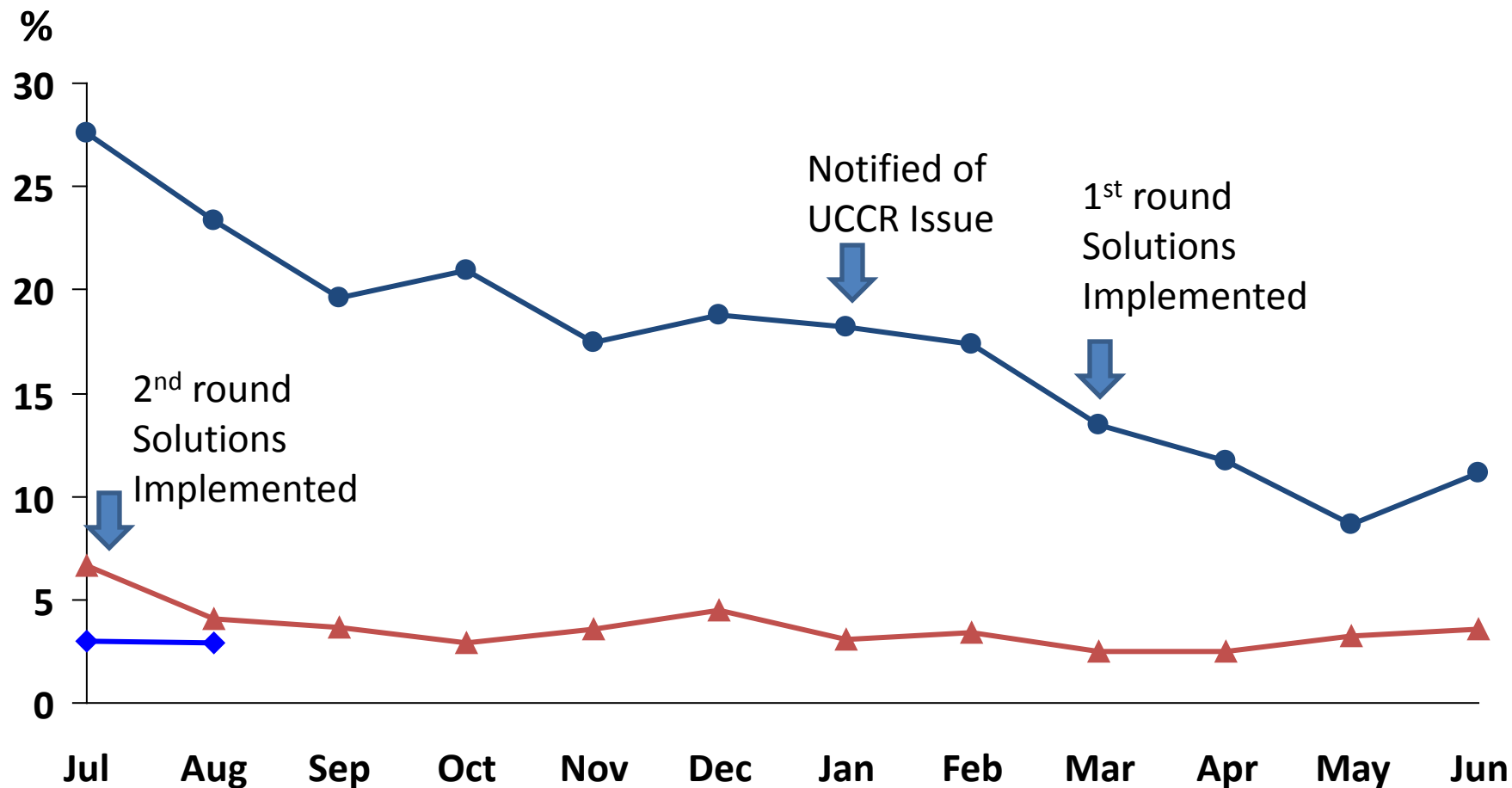
Findings:

- 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

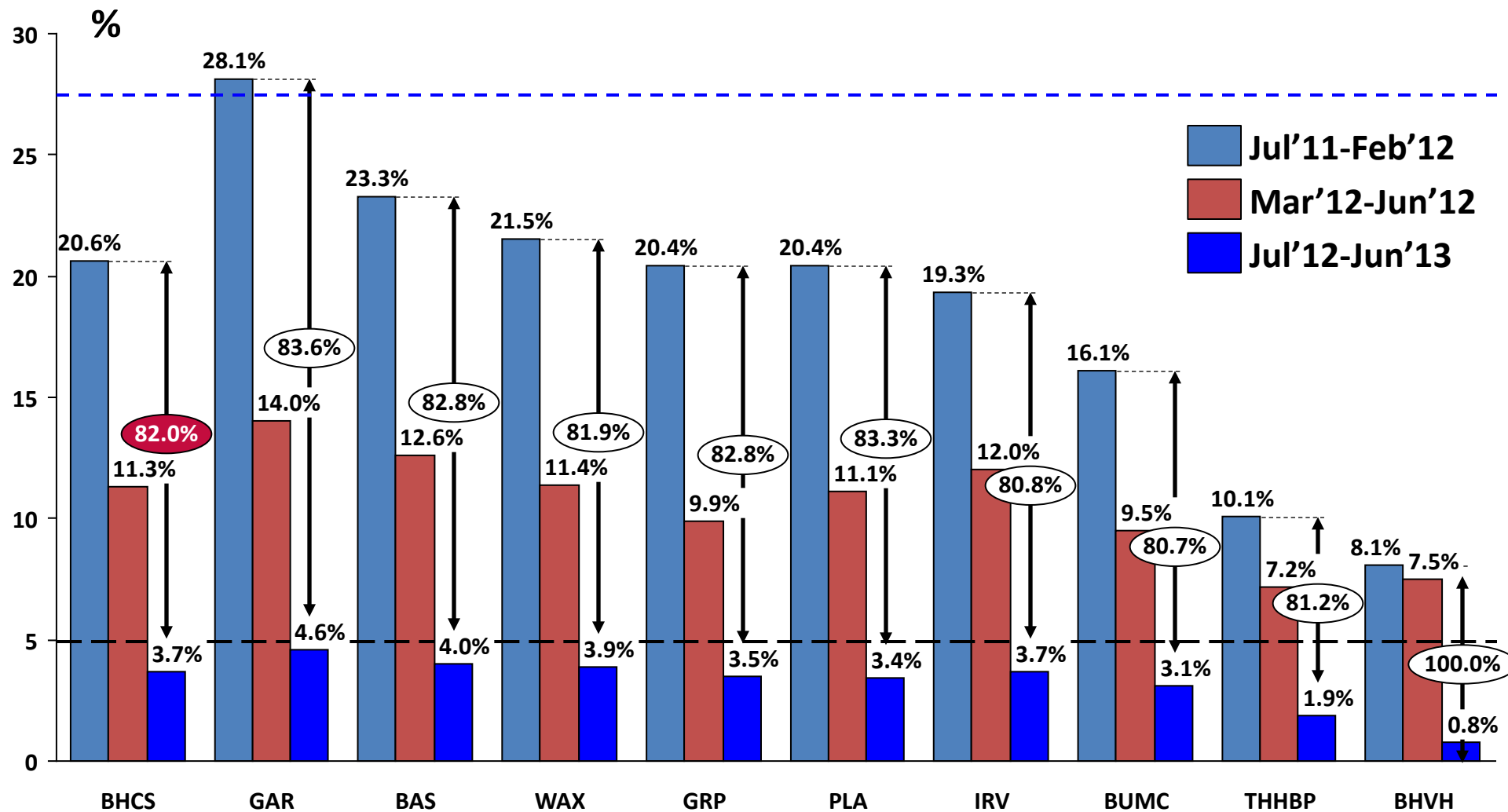
- Implemented specimen rejection criteria when:
 - units don't use UC Collection kit
 - grey tubes not being filled to the minimum volume (3mL)
- Some facilities report to Safety/Quality committee unit outliers
- Implemented in ED only that all urine testing be collected using UC Collection kit

BHCS UCCR Results

—●— FY'12
—▲— FY'13
—◆— FY'14

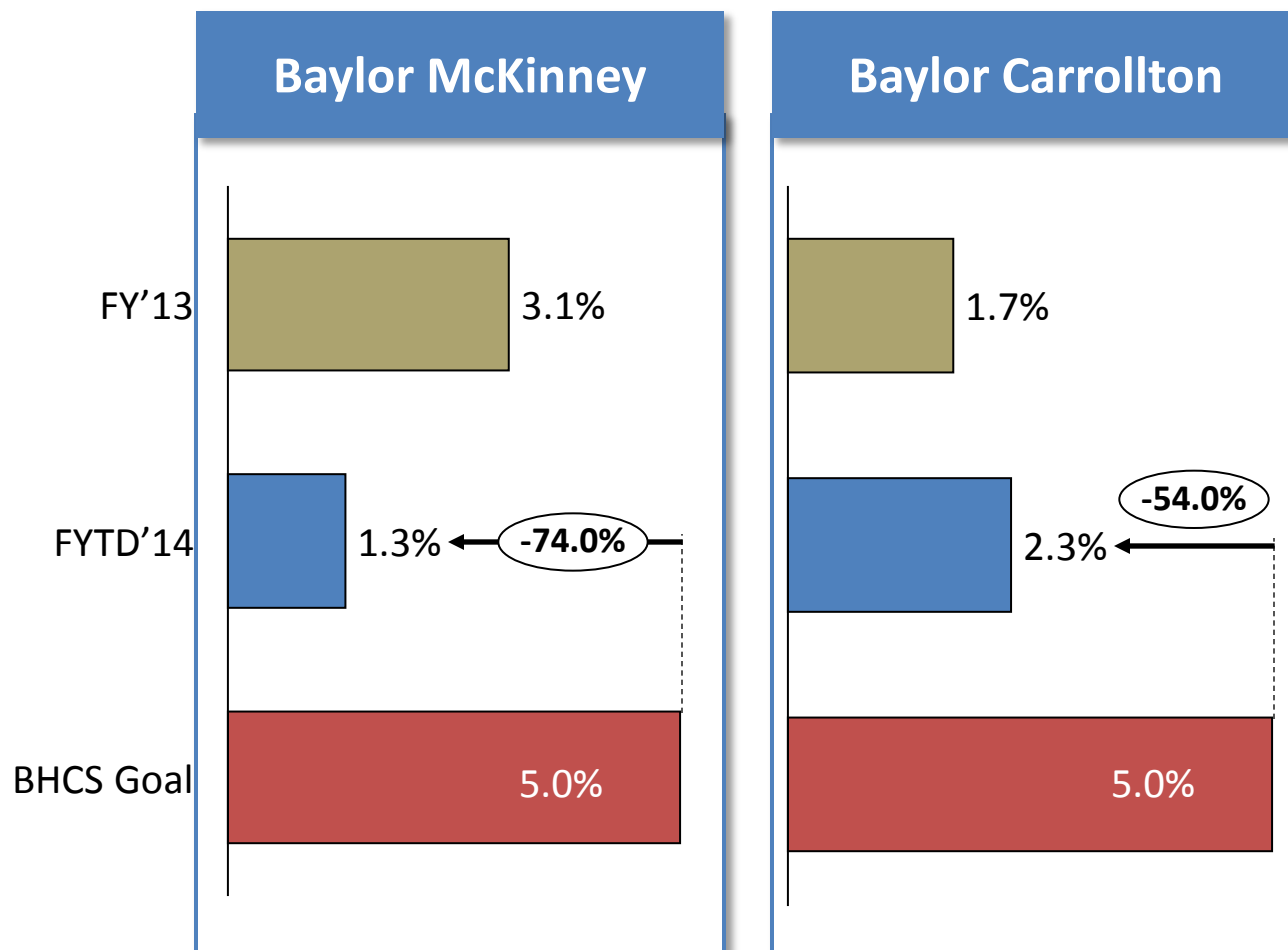


BHCS UCCR Improvements



Two New BHCS Facilities

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



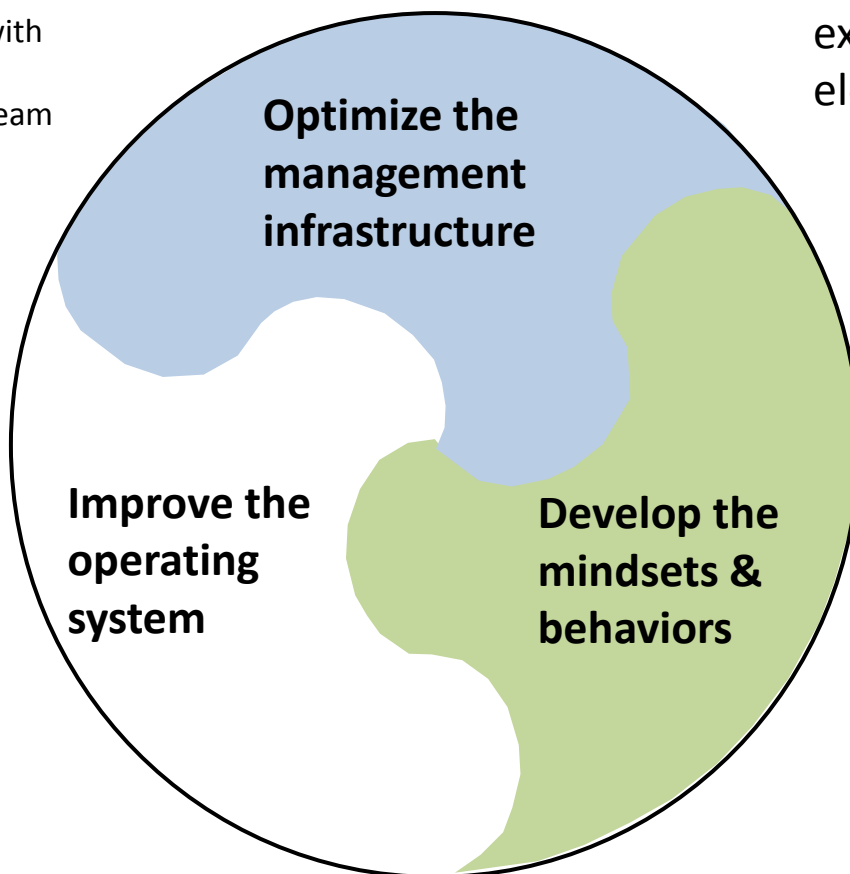
Changing Mindsets and Behaviors

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



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

Issues

Solutions

We didn't know we had a problem

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

Significant variation in processes at each BHCS facility

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

Changing mindsets and behaviors

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

Questions

