

# Implementing Practice Guidelines Using A Multidisciplinary Team Approach At ASM 2010

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**No Disclosures**

# The Key Is Collaboration and Communication

- Examine opportunities for improved communication between laboratory, nursing, pharmacy, administration, physicians & others
- Recognize when a multidisciplinary team is needed to improve processes and patient outcomes
- Discuss the collaborating efforts of a clinically focused multidisciplinary team and its effect on patient outcomes

# Implementation of Guidelines In Our Hospital

- Group B strep protocol for pregnant women (2 years of work)
  - Nursing (Jodi Gute RN in L/D)
  - Pharmacy (Bill Neff, pharmacist)
  - Administration (P&T, Med Exec committees)
  - **CDC guidelines for prevention of group B strep infection in pregnancy**

# Implementation of Guidelines In Our Hospital

- **2007 CLSI guidelines for blood stream infections (3 years of work)**
  - Infection prevention group; Brenda Heybrock RN, champion Administration; Process Improvement, Medical Exec and Nursing leadership
  - Laboratory management

Urine Process Improvement  
Project With A Multidisciplinary  
Care Team at our Hospital

# Why Worry About Urine?

- Healthcare spending (worldwide) on urine tests is \$566 million annually
- Assume an effectiveness level of 95%
- Estimated global cost of inefficiencies in urine collection, testing and analysis is nearly \$30 million a year
- Opportunities for improvement abound!

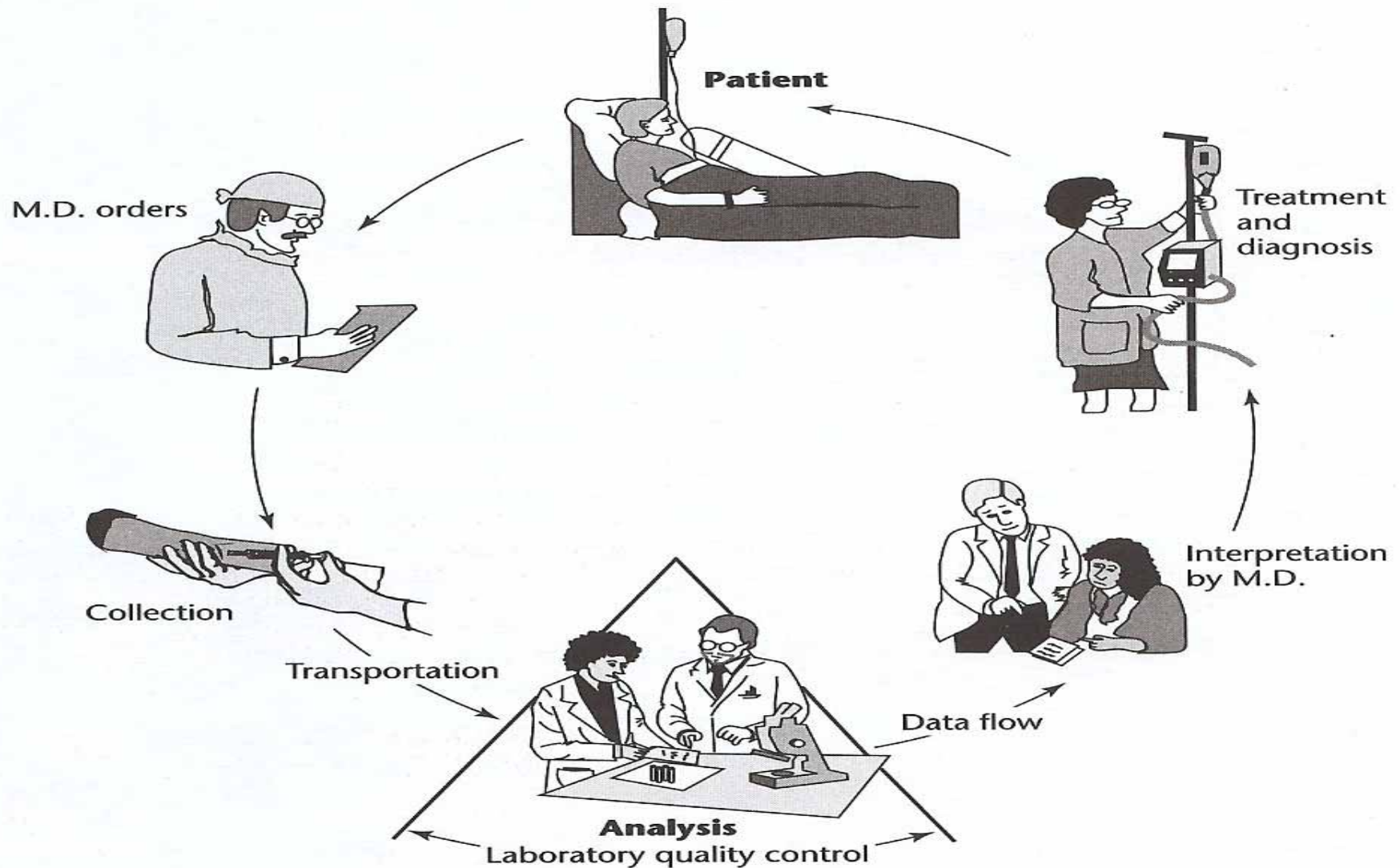
# Where Do Testing Errors Occur?

- 32 to 75% occur in the pre analytical phase
- Not all cause adverse events
- May not impact patient outcome
- Often associated with re work, further investigation
- May result in unnecessary risk to patient
- Unjustifiable cost to Healthcare system

# Good Specimen Management

- Specimen management in microbiology includes:
  - *Selection*
  - *Collection*
  - *Transport*
  - *Storage,*
  - *Analysis*
  - *Reporting*
- When errors occur at any point in this specimen management process, regardless of who might be responsible for the error, ***the result can be a negative outcome for the patient, such as misdiagnosis, extended length of stay and/or inappropriate therapy***

# Laboratory Testing Cycle



**Figure 1** The total laboratory testing process. Laboratorians must involve themselves in all aspects of specimen management, not just the analytical process.

# Our Job Is To Educate Clinicians Using Our Services

- We are responsible for all phases of the testing cycle
- In pre analytic phase of testing cycle: selection, collection and transport
- Not our comfort zone but is our responsibility
- How do we step up to the plate?

# Step Up To The Plate, We Can Not Do It Alone

- Continuous education of clinicians who use your services
- Teamwork with other parts of the laboratory
- Teamwork with nursing staff
- Teamwork with Infection Preventionists
- Follow national practice guidelines (CLSI, IDSA, CDC, others)
- Everyone has same goals, Patient safety

# Patient Safety IS About Effective Communication!

- We all have different educational levels & backgrounds and different focus on patient care
- **Med tech:** lab focus -working up specimens
- **Lab assistant:** receiving specimens, labeling and setting up
- **Nursing:** clinical focus - caring for physical needs of patients
- **Unit secretaries:** entering orders
- **Pathologist/Clinical Microbiologist:** when and how to perform testing, education of clinicians and support staff, problem solving
- **Clinicians:** want answers and direction; what to do with that answer

I Am Sure You All Have Heard The  
Story Of The Elephant...



# Elephant Stories

It Can Happen To Anyone

# Real Life Example- Specimen Labeled “Cath Tip”

- Cath tip culture growing 4 different types of gram negative rods!
- Had been set up as central venous line cath tip
- Technologist questioned whether it had been contaminated during collection
- Blood cultures were no growth
- Pulled specimen to look at it and realized it was a urine Foley cath tip!

# Cath Tip Culture Error

- Not labeled as to type of cath tip on floor (how would floor clerk know?)
- New **lab** specimen processing person did not know what cath tips looked like
- Foley cath tips are always unsuitable for culture
  - Always have urethral flora on them
  - Can not quantitate amount of bacteria present

# Cath Tip Culture Unintended Results

- Would have been to classify this patient as having a central line infection and treat her with antibiotics she did not need putting her at risk for C. diff colitis or other side effects
- Extended hospital stay
- Additional paperwork to correct error in record (administration/nursing/lab)
- Improper billing issues (billing office)

# Case Study; Long Term Care Asymptomatic Bacteriuria

- 84 yr old woman with long term Foley in place
- Daughter is retired RN and directs medical care (anxious about her mother)
- Urine smells bad so daughter wants urine culture just in case mom has UTI
- Grows 4 organisms, 2 GNR ( $10^5$ ,  $10^2$  and Staph and Enterococcus at  $10^4$  )
- Facility calls and requests sensitivity on GNR at  $10^5$

# What Should We Do?

- I was notified by the lab techs because request outside our guidelines and called the doctor, he explained situation
- I sent him 2009 IDSA guidelines on diagnosis, treatment and prevention of CA-UTI
  - change catheter before collection (or within 2 weeks prior to collection)
  - Smelly urine is not reason to obtain urine for culture
  - Foley may be able to be removed, daughter needs to be convinced

Hooton et al., (2010). Diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults: 2009 international clinical practice guidelines from the Infectious Diseases Society of America. *IDSA Guidelines*; 50:625-663.

# What Should We Do?

- Recommended he give guidelines to daughter, have her read them so she can help direct care appropriately (she will do it anyway and could be turned into a supporter)
- Multi drug resistant bacteria (MRSA, VRE, MDR-GNR) are an emerging problem in long term care facilities due to intensive use of antibiotics (this patient, MRSA +)
- C. diff colitis can occur secondary to antibiotic use and can kill patient
- Drug allergies can develop, limiting antibiotic use for patient later
- Cost of unnecessary diagnosis and treatment

# General Charge/Cost For UTI

- Lab charges (estimated)
  - urine culture: \$40-62
  - ID: \$47-72
  - Susceptibility: \$36-79
- <sup>1</sup>Cost of treating a hospital acquired UTI ranges from \$300 - \$3000 depending on organism needing to treat

<sup>1</sup>Tambyah, P., et al., (2002). The direct costs of nosocomial catheter-associated urinary tract infection in the era of managed care. *Infection Control and Hospital Epidemiology*; 23(1): 27-31.

# Urine Specimens

- Probably most common culture order
- Seems simple
- Easily replaced
- A UTI is not usually life and death

However Errors can result in:

- Wrong or delayed diagnosis
- Unnecessary medications
- Significant amount of additional cost
  - To Hospital or institution
  - Patient

# Guidelines Used To Get Our Team Started

- IDSA
- CDC
- CAP
- Cumitech on Urine
- Miller's Specimen Collection book
- JCAHO
- Wilson's Microbial Inhabitants of Humans

# Asymptomatic Bacteriuria

- Definition in women: 2 consecutive CCMV specimens with same bacteria at  $\geq 10^5$
- Definition in men: 1 CCMV specimen with single bacteria at  $\geq 10^5$
- A single straight cath specimen with 1 bacterial species at  $\geq 10^2$
- Pyuria is not an indication for treatment in absence of sign/symptoms of UTI

# Pyuria; When A Positive Is Not A Urinary Tract Infection

- Contamination from vagina, urethral opening
- Indwelling Foley catheter
- Urinary tract stones or foreign bodies
- Neoplasms (tumors)
- Appendicitis, pancreatitis, diverticulitis
- Interstitial cystitis or nephritis
- Nephrotic syndrome
- Post streptococcal glomerulonephritis

# Types Of Urinary Tract Infections

- Asymptomatic bacteriuria
- Symptomatic bladder infection
  - Acute uncomplicated cystitis
  - Acute non obstructive pyelonephritis (kidney infection)
  - Rare in men (long urethras)
- Complicated urinary tract infection
  - Functional/structural abnormalities of GU tract
  - Most men (enlarged prostate, foreskin)
- Re infection versus Relapse

# Asymptomatic Bacteriuria; When Is It Important?

- Pregnancy; screen once in early pregnancy and treat if positive (position of uterus) if +, periodic culture screens should be done
- Urologic surgery (TURP and others) which may cause mucosal bleeding; screen prior and initiate treatment shortly before procedure; stop tx after proced unless Foley catheter remains in place
- Abx tx of women with cath-acquired bacteriuria that persists 48 hrs after cath removal may be considered

# Asymptomatic Bacteriuria; When Is It NOT Important?

- Pre menopausal, non pregnant women
- Diabetic women
- Older persons living in community
- Elderly, institutionalized people
- Persons with spinal cord injury
- Catheterized patients while the catheter remains in situ
- No recommendations for renal txplt or other solid organ recipients

# Symptomatic UTI; What Is It?

- *Acute uncomplicated urinary tract infection* is a symptomatic bladder infection in person with a normal GU tract characterized by:
  - Frequency
  - Urgency
  - Dysuria
  - Suprapubic pain

# IDSA S-UTI Criteria

- S/S compatible with Symptomatic UTI (SUTI):
  - New onset or worsening of fever, rigors, altered mental status, malaise, or lethargy with no other identified cause;
  - flank pain;
  - costovertebral angle tenderness;
  - acute hematuria;
  - pelvic discomfort;
  - and in those whose urinary catheters have been removed: dysuria, urgent or frequent urination, suprapubic pain/tenderness (A-III)

Hooton et al., (2010). Diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults: 2009 international clinical practice guidelines from the Infectious Diseases Society of America. IDSA Guidelines; 50:625-663.

# IDSA CA-UTI Criteria

- **Catheter Associated Urinary Tract Infection (CA-UTI)**: presence of symptoms or signs compatible with UTI with no other identified source of infection along with:
  - $\geq 10^3$  cfu/ml of  $\geq 1$  bacterial species in a midstream voided urine or single straight cath specimen from a patient whose urethral, suprapubic, or condom catheter has been removed within the previous 48 hr

■ Hooton et al., (2010). Diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults: 2009 international clinical practice guidelines from the Infectious Diseases Society of America. IDSA Guidelines; 50:625-663.

# CDC CA UTI Criteria

- **Catheter Associated Urinary Tract Infection (CAUTI)**

Must meet at least 1 of the following criteria:

- **Criteria 1 ...**

- Patient had an indwelling urinary catheter in place at the time of specimen collection **OR** removed within the 48 hours prior to specimen collection

*and*

- at least 1 of the following signs or symptoms with no other recognized cause:
  - fever ( $>38^{\circ}\text{C}$ ), suprapubic tenderness, or costovertebral angle pain or tenderness

*and*

- a positive urine culture of  $\geq 10^5$  CFU/ml with no more than 2 species of microorganisms.

The National Healthcare Safety Network (NHSN) Manual. (March, 2009). Patient safety component protocol. Division of Healthcare Quality Promotion National Center for Preparedness, Detection and Control of Infectious Diseases; Atlanta, GA.

# CDC CA-UTI Criteria

## ■ Criteria 2 ...

- *Same as Criteria 1 with the addition of:*

- a positive urinalysis demonstrated by at least 1 of the following findings:

- positive dipstick for leukocyte esterase and/or nitrite
- pyuria
  - urine specimen with  $\geq 10$  white blood cells [WBC]/mm<sup>3</sup> or  $\geq 3$  WBC/high power field of unspun urine
- microorganisms seen on Gram stain of unspun urine

# Improvement Opportunity

- We identified increased urine cultures with coag-neg staph > 100k. Many retrieved via straight cath
  - Suspicious of high incidence of urine contamination with collection process
  - Mis labeled specimen collection?
- Hospital wide issue

# People Affected

- Patients
- Nursing Staff
- IT
- Pathology laboratory
- Clinicians
- Infection control

# Team Approach

- Pathology/Microbiology
  - Pathologist
  - Management
- Nursing
  - Clinical Nurse Specialist
  - Staff Development
- Performance Improvement
  - Medical
  - Nursing
- Informatics
- Senior Administration
  - Service Executives
  - Vice President of Clinical Support Services
- Infection Prevention
- Physicians

# More Opportunities

- Documentation / label
  - Patient with chronic indwelling Foley had specimen labeled incorrectly as mid void.
- Collection
- Transport
- Storage

Focus on urine specimen workflow; Medical Laboratory Observer, March 2010, Vol 42, No. 3 pg 20-27

# Documentation

- College of American Pathologist (CAP) inspection checklist:
  - GEN.40700 Phase II deficiency: Are all specimens accompanied by an adequate requisition?
  - GEN.40750 Phase II deficiency: Does the paper/electronic requisition include all of the following elements as applicable?

# Requisition Form

- Purpose of requisition form is to supply the lab with needed information
- Laboratory needs specific and critical information from the physician regarding the patient and the specimen to help formulate a pathology diagnosis

# Required Data on Requisition Forms

- Patient's first and last name
- Hospital number
- Specific culture site
- Date and time of collection

Miller, J., (1999). A Guide To Specimen Management in Clinical Microbiology (2<sup>nd</sup> ed.). Washington, DC: ASM Press.

# Documentation of Collected Specimen

- Laboratory
  - March 2008: Requisition forms complete 30% regarding how the specimen was obtained

Nebraska Methodist Hospital  
Order Requisition Form

Patient Information

Patient: Mickey Mouse      Age: 75 Years  
DOB: 05/22/32      LOS: 2 days  
Admit Date: 09/15/07  
Attending MD: Donald Duck

Order Details

Procedure: Culture Urine

Collection Priority: Stat  
Specimen Type: Urine

Straight Cath  
 Foley Cath  
 Clean Catch  
 Supra Pubic  
 \_\_\_\_\_

Collected Date/Time: 9/17/07 at 1530  
Collected By: Daffey Duck RN

Ordering MD: Donald Duck

Ordering Comments:

# Documentation of Collected Specimen

- Nursing
  - Need better guidance on forms on how to complete
  - No consequence to nurse for incomplete form
  - Manual completion of form

Nebraska Methodist Hospital  
Order Requisition Form

Patient Information

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Collected By: Duffey Duck RN

Ordering MD: Donald Duck

Ordering Comments:

# Documentation of Collected Specimen

- Solution
  - Laboratory:
    - Review guidelines for specimen labeling
    - Implement rejection criteria for specimens if not labeled completely per accreditation agency guidelines and hospital policy
      - 2 forms of patient identification
      - Specimen collection type
        - Clean catch mid void (CCMV)
        - Foley catheter
        - Straight catheter
      - Date/Time of collection
      - Name of person who collected the specimen

# Documentation

- Solution
  - IT help
  - Develop electronic requisition form
    - MD order triggers electronic requisition documentation form for nurse to fill out
    - Required elements to mandate compliance per recommendations from Laboratory

# Documentation

- Solution – Implemented 4<sup>th</sup> Q 2008
  - Requisition form
    - After completion, paper form automatically prints and nurse sends with specimen to lab
  - Lab rejection policy if form not complete for in-patient areas

The screenshot shows a web browser window titled "Specimen, Lab-Nurse Collect - Testcenter, Methodist". The page header includes "Performed on: 01/19/2010 0832" and "By: Vickie Dolan, CNS". The main content area is titled "Specimen, Lab - Nurse Collect" and contains the following text:

**Must Accompany Specimen**  
**Lab will reject specimen if this form does not accompany specimen**  
**Must Send Specimen Within 15 Minutes from Collection to Prevent Inaccurate Results**

**Specimen Type-Body Site**

- Urine Clean Catch, Midvoid
- Urine Foley Cath
- Urine Ileostomy
- Urine Kidney L
- Urine Kidney R
- Urine PEDI Bag
- Urine Straight Cath
- Urine Suprapubic Cath
- Urine Voided
- Urine Cystoscopy
- Urine Nephrostomy L
- Urine Nephrostomy R

**Collection Date/Time**

01/19/2010 08:32

**Special Procedure Used to Obtain Specimen**

**Collected By**

Vickie Dolan

The bottom of the screenshot shows the Windows taskbar with the Start button, "Cerner Appbar", and several open applications including "Inbo...", "X:\N...", "H:\Mi...", "Micro...", "Micro...", "Powe...", and "Testc...". The system clock shows "8:32 AM".

# Documentation

- Outpatient areas not electronic
  - Paper form to be same as electronic form

Nebraska Methodist Hospital  
Order Requisition

Patient Information

Patient: \_\_\_\_\_ MR#: \_\_\_\_\_  
DOB: 12/27/91 Age: 18 Years Sex: Male FIN#: \_\_\_\_\_  
Admit Date: 02/08/10 LOS: 0 days Location: MH Emergency Department//  
Attending MD: \_\_\_\_\_ Visit ID: \_\_\_\_\_

Order Details

Procedure: UA (Culture if Positive) Order Status: Ordered

Collection Priority: Stat  
Specimen Type: Urine

Urine Clean Catch, Midvoid  Urine PEDI Bag  Urine Nephrostomy L  
 Urine Foley Cath  Urine Straight Cath  Urine Nephrostomy R  
 Urine Ileostomy  Urine Suprapubic Cath  
 Urine Kidney L  Urine Voided  
 Urine Kidney R  Urine Cystoscopy

Collected Date/Time: \_\_\_\_\_  
Collected By: \_\_\_\_\_

Ordering MD: \_\_\_\_\_ Order Date/Time: 02/09/10 00:00  
Ordering Type: Written  
Ordering entered by: \_\_\_\_\_ Printed Date/Time: 02/09/10 00:00

Ordering Comments

# Documentation

- Staff Reminders
  - Magnet at station where specimens sent to lab
  - E-mails sent to nursing staff



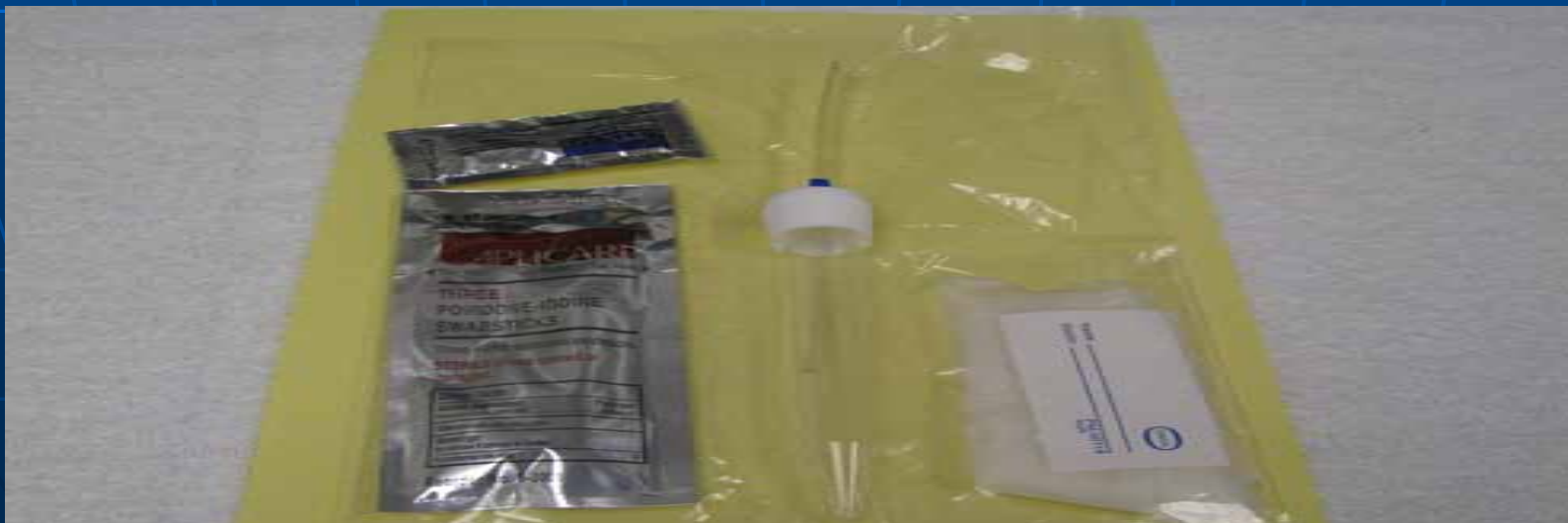
# Documentation

Measure: Urine specimens sent to the lab labeled correctly and form completed accurately

<i>Data Collection Dates</i>	<i>Inpatient floor compliance</i>	<i>Outpatient compliance</i>	<i>Overall compliance</i>	<i># Rejected inpatient</i>
November 1-15, 2008	55%	36%	46%	
March 30, 2009	100%	96%	98%	1

# Sub Optimal Urine Specimen Collection

- Nursing Opportunities taken on by Nursing
  - Incorrect procedure
    - Initial volume collected (first void)
  - Incorrect equipment
    - Quick cath – collects first 10 ml (picture)



# Teamwork For Patient Safety

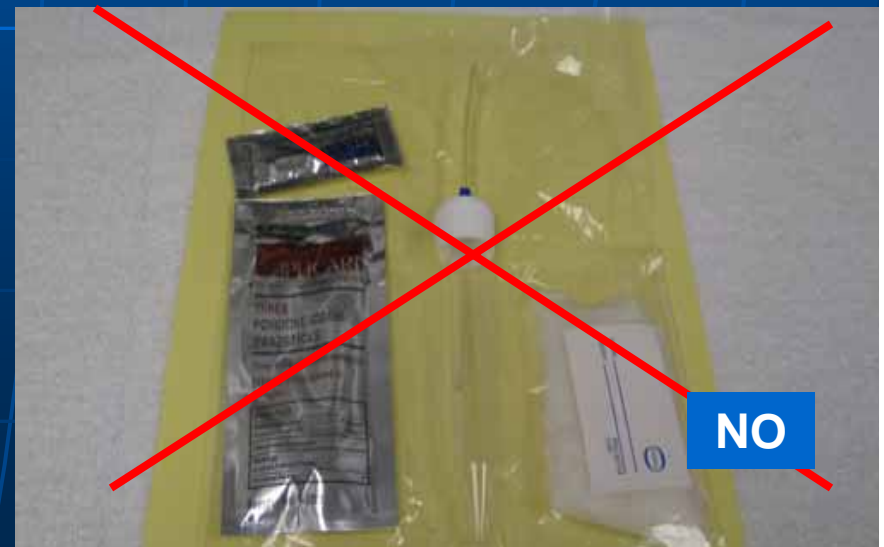
- Dr. C tasked by nurses to discuss with Company
- No label for use on product- allows inappropriate use of product (all over town) for UA and urine culture; result? possible over diagnosis and treatment of UTI
- Rep did literature search, confirmed what I told her, nurse for many years and did not know that a straight cath needed to be a mid void
- Surprised that no one had told them this before
- Appropriately concerned about quality and patient safety
- Rep submitted request for revision to "instructions for use and package labeling to indicate that this product **should not** be used for collection of urine for culture
- **Follow up pending, called company & FDA  
Alert filed**

# What Did I Learn?

- Teamwork for patient safety
  - Not just our hospital
  - Other hospitals in town (local)
  - Hospitals across the country
  - The company was also concerned about improving quality of care for the same reasons
  - If we made this mistake, others will too

# Urine Specimen Collection

- Solution (Nursing):
  - Literature Review for best practice by APRN
  - Replace equipment with evidence based practice recommendations
  - Collect late stream vs early stream
  - Nursing policy changes



# Sub-optimal Urine Culture Collection

- Cost savings from switching away from Quick cath to appropriate urine culture collection kit ( which is cheaper)
- Lab work up of Coag neg Staph in urine decreased by 250 per year
- Saved \$35,250.00 (ID & Sens=\$141.00) in Lab work up per year
- Saved \$750,000.00 per year (\$3000.00 in Antibiotic treatment per

# Urine Specimen Collection

- Inconsistent midstream voided urine collection instructions within institution
  - Outpatient vs Inpatient

# ORIGINAL URINE COLLECTION INSTRUCTIONS FOR MALES



## How To Provide A Clean Catch Urine Sample

*To get the best possible test results, please follow these instructions carefully*

### Instructions for males:

1. Wash the hands with soap and water, rinse and dry.
2. **WASH.** Expose the penis, retract the foreskin (if not circumcised), and wash the end of the penis with one towelette.
3. **RINSE.** Rinse with the sterile saline towelette.
4. **VOID.** Pass the first portion of urine into the toilet, then pass a portion of remaining urine into the specimen container. The cup should be held to avoid contact with any skin and clothing. Keep the fingers away from the rim and inner surface of the container.
5. When voiding is completed, close the container, wash the hands, label the container, dress, and give the container to the attendant.

If you are collecting the specimen at home, take the labeled container to the place directed by your health professional (office or lab) immediately. It is important to **keep the specimen cold** from the time it is collected until you are ready to take it to the office or lab.

(Instructions for females on other side)

# ORIGINAL URINE COLLECTION INSTRUCTIONS FOR FEMALES

## How To Provide A Clean Catch Urine Sample

*To get the best possible test results, please follow these instructions carefully*

### Instructions for females:

1. Wash your hands with soap and water, then rinse and dry.
2. Open all the towelettes and place them on a clean surface. (i.e., a cloth or paper towel)
3. Place towelettes and specimen container within easy reach.
4. Remove all undergarments.
5. Sit comfortably on the seat and swing one leg to the side as far as possible.

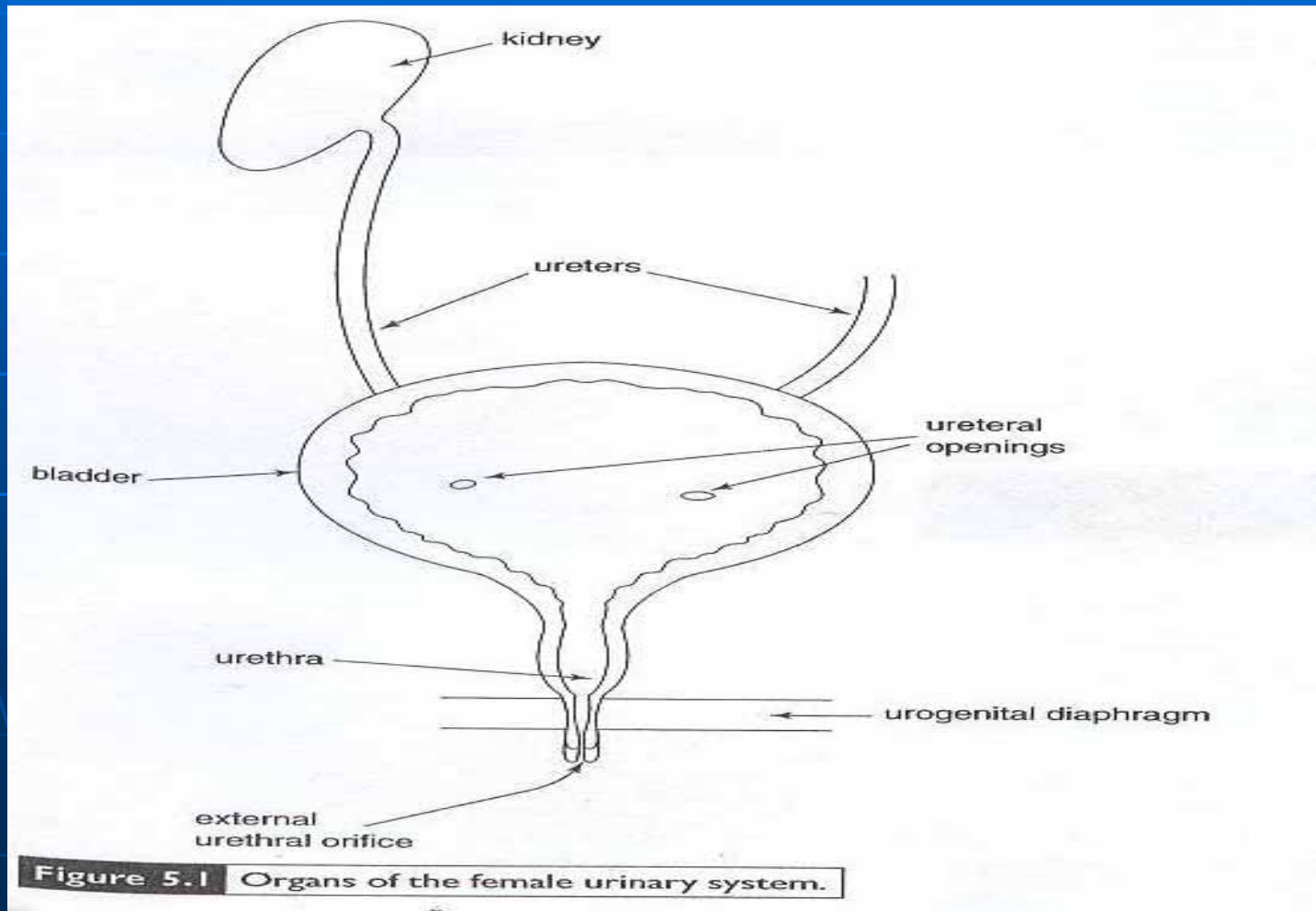
6. **With one hand spread the labia folds and keep them spread during the cleansing and collection of the urine specimen. (see the diagram)**



7. **WASH** the area from which the urine is passed. Use the two soap towelettes. Using one towelette at a time, begin to wash gently wiping only from front to back between the folds of skin. Discard that towelette. Repeat the front to back wash process, using one towelette at a time.
8. **RINSE.** Rinse with sterile saline towelettes. Use the front to back motion
9. **VOID** a small amount of urine into the toilet, then collect a portion of the urine in the specimen container. The cup should be held to avoid contact with skin and clothing. Keep the fingers away from the rim and inner surface of the container.



# GU Female Anatomy



# Microbiology Rational for Midstream Void Instructions

- NL female urethra(3.8 cm); colonized by 2 to 11 different organisms with total population of between  $10^5$  and  $10^6$  viable microbes
- Lactobacilli (protective!), Coag neg Staph, diptheroids, anaerobes & mycoplasma
- Age/sexual maturity result in changes in bacteria present; older age groups have > # of organisms present and increase in different types including G.N.Rods!
- Tx with antibiotics can result in colonization with Gram negative rods such as E. coli, Kleb, Proteus

# Rational Midstream Collection

- Tx for UTI with some abx can increase risk for occurrence of 2<sup>nd</sup> UTI due to colonization of urethra by GNR
- The vaginal and perineal area are colonized by GI flora and this can contaminate urine specimens
- Dissemination of microbes from urethra occurs during urination: Viable bacteria per ml ranges from 0 to  $10^5$  cfu in patients without a UTI! (usually 10 to 1000 cfu)

# Mid Stream Collection

- Males; 20 cm urethra, first 6 cm colonized with bacteria; reason for less UTIs in males
- Types of bacteria vary with age and sexual activity
- Sexually activity results in > number and diversity of bacteria (G. vag, GNR anaerobes, Grp B, yeast)

Microbial Inhabitants of Humans: their ecology and role in health and disease

Michael Wilson 2005, Cambridge University Press

# Urine Specimen Collection

- Solution (Nursing):
  - Standardize steps to obtain midstream voided urine specimen in outpatient and inpatient areas
  - Policy changes to reflect evidence base recommendations
  - Nursing staff education
- Implementation: 4<sup>th</sup> Q 2008

# NEW - INSTRUCTIONS FOR MALES

NEW

**METHODIST**  
HOSPITAL  
PATIENT EDUCATION | (402) 354-4301

## How To Provide A Clean Catch Urine Sample

**IMPORTANT:** *It is important to follow the instructions below exactly, to properly clean the bacteria from the skin and urinary opening. A dirty specimen may result in the need for a second test, or worse yet, may be the cause of a wrong diagnosis, unnecessary medicine, or the wrong medicine being given to you.*

### Instructions for males:

1. Wash the hands with soap and water, rinse and dry.
2. **WASH.** Expose the penis, retract the foreskin (if not circumcised), and wash the end of the penis with one soap towelette.
3. **RINSE.** Rinse with one sterile saline towelette.
4. **VOID.** Pass the first portion of urine into the toilet, then pass a portion of remaining urine into the specimen container. The cup should be held to avoid contact with any skin and clothing. Keep the fingers away from the rim and inner surface of the container.
5. When voiding is completed, close the container, wash the hands, label the container, dress, and give the container to the attendant.

If you are collecting the specimen at home, take the labeled container to the place directed by your health professional (office or lab) immediately. It is important to **keep the specimen cold** from the time it is collected until you are ready to take it to the office or lab.

### **Questions About Your Test:**

If you have any questions about the test, call the doctor that ordered the test or the Pathology Center, 354-4541 or 888-432-8980.

(Instructions for females on other side)

NEW

NEW

# NEW - INSTRUCTIONS FOR FEMALES

## How To Provide A Clean Catch Urine Sample

**IMPORTANT:** It is important to follow the instructions below exactly, to properly clean the bacteria from the skin and urinary opening. A dirty specimen may result in the need for a second test, or worse yet, may be the cause of a wrong diagnosis, unnecessary medicine, or the wrong medicine being given to you.

### Instructions for females:

1. Wash your hands with soap and water, then rinse and dry.
2. Open all the towelettes and place them on a clean surface. (i.e. a cloth or paper towel)
3. Place towelettes and specimen container within easy reach.

4. Remove all undergarments.
5. Sit comfortably on the seat and swing one leg to the side as far as possible.

6. **With one hand spread the labia folds and keep them spread during the cleansing and collection of the urine specimen.** (see the diagram) **vagina**

labia

urinary opening

3 soap towelettes

opened towelettes

7. **WASH** the area from which the urine is passed. Use the three soap towelettes. Using one towlette at a time, begin to wash gently wiping only from front to back between the folds of skin. Discard that towlette. Repeat the front and back wash process, using one towlette at a time.
8. **RINSE.** Rinse with one sterile saline towlette. Use the front to back motion
9. **VOID** a small amount of urine into the toilet, then collect a portion of the urine in the specimen container. The cup should be held to avoid contact with skin and clothing. Keep the fingers away from the rim and inner surface of the container.

NEW

### Questions About Your Test:

If you have any questions about the test, call the doctor that ordered the test or the Pathology Center, 354-4541 or 888-432-8980.

# Urine Specimen Collection

- Measure: Decrease rate of urine contamination
- Definition of contamination: > 2 isolates at  $\geq 10^4$
- Process Improvement looked at rate of diagnosis of UTI in hospital and found a rate of 6.36% (2007) prior to institution of improvements and a rate of 5.44% (2009)
- P value of 0.00824 (significant if  $p < 0.05$ )
- Potential savings of \$50K to \$500K per yr

(167 cases less at \$300 - \$3000/case)

Urine Culture Contamination, A CAP Q-probe study of 127 Laboratories; Arch Path Lab Med, Vol 132, June 2008

# Urine Processing (In Hospital)

- RN or CPA collect specimen
- Tube to lab specimen processing (15 min)
- Lab specimen processing carries to Body fluids immediately (if can't put in "sweater box" to keep cold)
- Body fluids runs UA immediately (if can't put in Sweater box to keep cold)
- When done place in refrigerator for Micro to pick up every hour
- Micro sets up culture

# Urine Transport

## Bedside to Lab

Date 2009	Average time from collection to arrive in lab (at room temperature)	Average time from in lab to being processed (UA)	Average time from collection to being processed
Jan	Range: 10 - 81 min	Range: 13 - 28 min	Range: 26 - 109 min
June	Range: 8 - 62 min	Range: 11 - 37 min	Range: 19 - 79 min
August	Range: 4 - 120 min	Range: 13 - 29 min	Range: 23 - 133 min

# Urines Must Be Kept Cold

- E. coli has a doubling time of 20 minutes
- 1 E. coli per ml
- In 2 hours you will have  $10^5$  E. coli per ml
- Keep them cold to prevent growth, single most important factor in preventing contamination

Urine Culture Contamination, A CAP Q-probe study of 127 Laboratories; Arch Path Lab Med, Vol 132, June 2008

# Urine Transport

- Issue: Urine specimens at room temperature > 20 minutes prior to being sent to lab
- Brainstorm – group discussion
  - Increase Nursing staff awareness of expectation to get specimens to lab within 15 minutes
    - Fliers posted on units
    - Magnets by “tube” station identify need to get specimen to lab within 15 minutes
    - Time requirement added to requisition form
  - Implementation: 4<sup>th</sup> Q 2009

# Urine Transport

- Nursing Staff Communication
  - Flier posted on each nursing unit

## Improving Patient Care Urine Specimen Collection

**Problem: Urine Specimens Left at Room Temperature > 20 minutes**  
Data Collection – Urine Cultures<sup>1</sup>

Date 2009	Average time from collection to arrive in lab (at room temperature)
January	Range: 10 - 81 min
June	Range: 8 - 62 min
August	Range: 4 - 120 min

- Microorganisms double q 20 minutes when at room temperature<sup>2</sup>

### Contamination of urine specimens based on several factors<sup>3</sup>

- Improper specimen collection technique
- Lengthy time from collection to processing
- Faulty process of transporting specimens
- Storage of specimens<sup>4</sup>

### Potential impact of contaminated urine specimens<sup>4</sup>

- Inaccurate results may lead to:
  - = Inadequate therapy (overuse of antibiotics)
  - = Increased cost
  - = Harm to patients
    - Increased MDRO
    - Increased incidence of c. diff

### Recommendations

- Minimize time specimen kept at room temperature to minimize bacterial growth
- Shorten time from collection to processing:
  - **Send specimens to lab within 15 minutes of collection**

**Must Accompany Specimen**  
Lab will reject specimen if this form does not accompany specimen  
**Must send specimen within 15 minutes of collection to prevent inaccurate results**

**Results**

Specimen Type/Body Site

Collection Date/Time

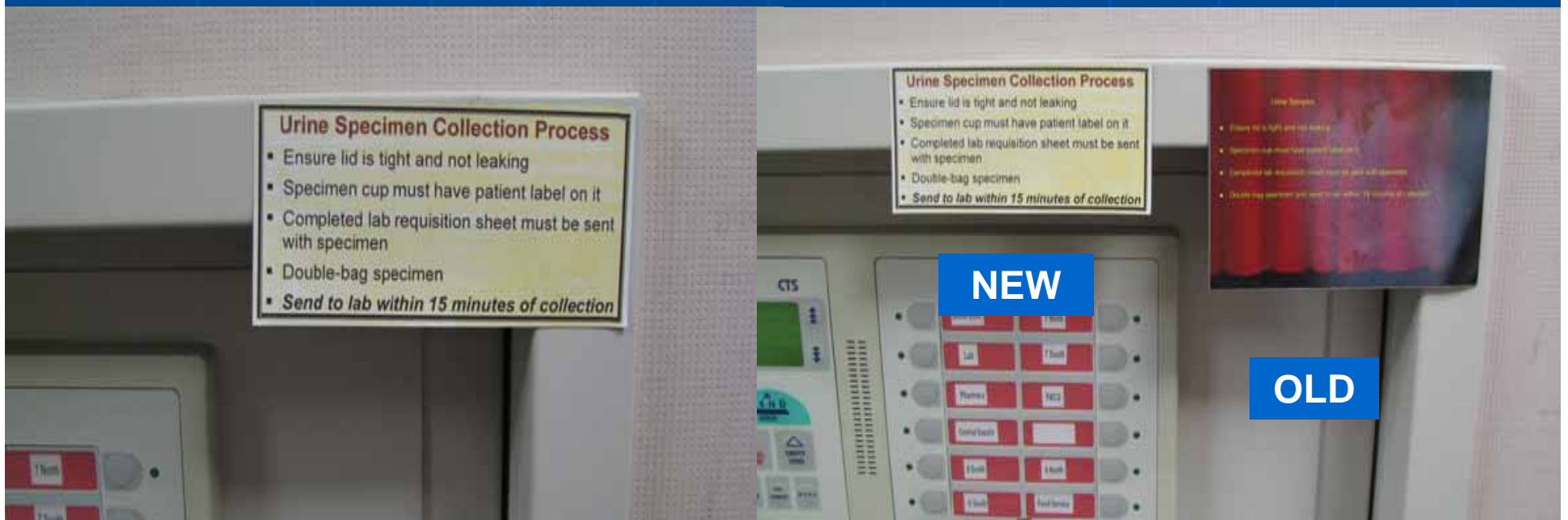
Special Procedure Used to Obtain Specimen

Collected By

Reference:  
1. National Medical Laboratory – Microbiology Services  
2. Dr. Nancy Corbett – Pathologist at Tennessee Methodist Hospital  
3. National Medical Laboratory – Microbiology Services  
4. Spelman, L., et al., (2008). Urine culture contamination. *Antonie van Leeuwenhoek*, 92(1):141-147.

# Urine Transport

- Nursing Staff Communication
  - New Magnet posted with reminder to send specimen **within 15 minutes of collecting**
  - Located at each “Tube System”
  - Bigger letters = easier to read



# Urine Transport

- Nursing Staff Communication
  - Updated electronic requisition form reflecting 15 minute time limit

Specimen, Lab-Nurse Collect - Testcenter, Methodist

Performed on: 01/19/2010 0832 By: Vickie Dolan, CNS

Specimen, Lab - Nurse Collect

Specimen, Lab-Nurse Collect

**Must Accompany Specimen**  
**Lab will reject specimen if this form does not accompany specimen.**  
**Must Send Specimen Within 15 Minutes from Collection to Prevent Inaccurate Results**

**Specimen Type-Body Site**

- Urine Clean Catch, Midvoid
- Urine Foley Cath
- Urine Ileostomy
- Urine Kidney L
- Urine Kidney R
- Urine Pedi Bag
- Urine Straight Cath
- Urine Suprapubic Cath
- Urine Voided
- Urine Cystoscopy
- Urine Nephrostomy L
- Urine Nephrostomy R

**Collection Date/Time**

01/19/2010 08:32

**Special Procedure Used to Obtain Specimen**

**Collected By**

Start Cerner Appbar Inbo... X:\N... H:\M... Micro... Micro... Powe... Testc... 8:32 AM

# Urine Transport

Data collected on Urine within Lab:

Date 2009	Average time from collection to arrive in lab (at room temperature)	Average time from in lab to being processed	Average time from collection to being processed
Jan	Range: 10 - 81 min	Range: 13 - 28 min	Range: 26 - 109 min
June	Range: 8 - 62 min	Range: 11 - 37 min	Range: 19 - 79 min
August	Range: 4 - 120 min	Range: 13 - 29 min	Range: 23 - 133 min

# Urine Storage

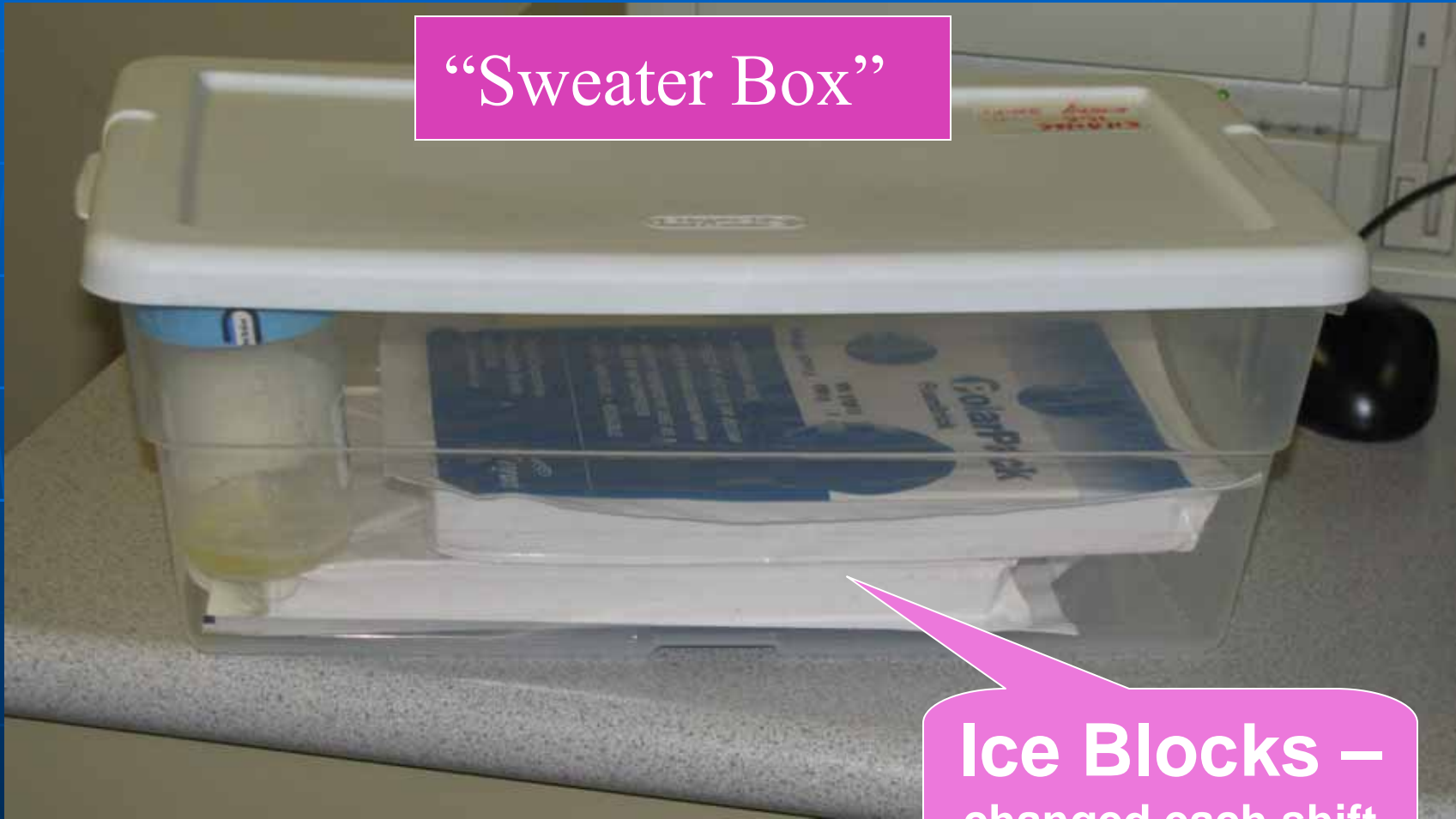
- Brainstorm – group discussion
  - Laboratory
    - Explore cooling/storage process in Lab
      - Temperature of cooler (not measured)
      - Develop process for maintaining cooler at a pre-set temperature
      - Thermometer
      - Who measures this, how often, and where will it be recorded?
  - Measure: Urine storage coolers will be maintained at \_\_\_\_\_ C 100%

# Lab Procedure

- SPECIMEN CONTROL PROCESS FOR HANDLING URINE SPECIMENS
- Urine specimen is received into lab via Tube Station or Specimen Control.
  - Check to see that specimen is properly labeled with name and Med Rec#
  - Power form or copy of requisition must accompany specimen.
  - Note that collection time to receipt time in lab is not greater than 15 minutes.
  - Log specimen in.
  - Generate labels and deliver to department for testing.
  - Verbally notify technologist of specimen drop off.
  - If power form missing or >15 minutes clerk will notify floor of need to reorder and recollect.
- During heavier workload periods if the specimen can not be logged in immediately time stamp the power form and place specimen directly into the sweater box to keep cold. Within the next few minutes follow the steps listed in 1.

# Urine Storage

“Sweater Box”



**Ice Blocks –**  
changed each shift

# “Sweater Box”



**Ineffective**

**Communication is the  
most frequently cited root  
cause for sentinel events**

# CDC 2007 Strategic Planning For Continuous Quality Improvement in Laboratory Medicine

- Collaborative care between providers of lab services and consumers/other providers/payers
- Measures of Quality to link lab service performance with patient outcome
- Ways lab medicine is expected to contribute to the future of health care

# Who Was At The Table?

- Institute of Medicine
- JCAHO
- Centers for Disease Control
- American Medical Association
- College of American Pathologists
- American Society of Clinical Pathology

# Institute Of Medicine - 6 Quality Domains

## Translated Into The Lab

- Safety
- Effectiveness
- Patient centeredness
- Timeliness
- Efficiency
- Equity

# Culture Shift: The Patient Safety Movement

- Captain of the ship model to team based approach; empowerment of and accountability of all of the health care team members
- How can the laboratory as a whole be part of this team based approach?

# Laboratorians/Opportunity

Implement practices and improve processes to increase patient safety (reduce sentinel events) and reduce cost of health care as Leaders of Multidisciplinary care teams

# Summary

- To improve patient safety and practice, need to strive for best practice among ALL involved
- Education and understanding why we are doing something is key to the whole elephant
- Ask questions!
- JCAHO recommendations regarding communication among practitioners
- "Better" great book by Atul Gawande (surgeon)

## Useful References

1. **Grzybicki, D.M., A Summary of Deliberations on Strategic Planning for Continuous Quality Improvement in Laboratory Medicine  
Am J Clin Pathol, 131, 315-320, 2009**
2. **Haynes, A.B. et al. A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population  
NEJM, 360:491-499, 2009**
3. **Novis, D.A., Reducing Errors in the Clinical Laboratory: A Lean Production System Approach LABMEDICINE, 39, 522-529**