

A DNP PROJECT

**Reducing urine culture specimen contamination rate by patient education using a
visual aid-A quality improvement project.**

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VIDEO INSTRUCTION TO REDUCE SPECIMEN CONTAMINATION RATE

DNP PROJECT

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Introduction

Health care institutions across the country attempt to maintain a high level of performance by providing quality healthcare to the community. Institutions are ranked based on their performance in maintaining the quality measures in different aspects of the healthcare. According to the Agency for Healthcare and Research (AHRQ, 2016), the goal of healthcare is to improve an individual's physical and mental wellbeing. This goal can be achieved by providing quality healthcare. Laboratory testing plays a significant role in the provision of quality care since it contributes to diagnosis and prognosis of disease, treatment monitoring, and disease screening. Almost 70% of medical decisions are based on laboratory tests. There are an estimated 7-10 billion laboratory tests performed each year in the United States (Howerton, Anderson, Bosse, Granade, & Westbrook, 2005). Therefore significant national attention is focused on adopting patient safety measures to reduce medical errors in doing laboratory tests. Patient safety may become compromised when quality measures are not properly followed. Data shows that lab specimen contamination rate is high and it is a significant problem to be addressed to maintain patient safety (Stankovic & DiLauro, 2010). Improper method of urine culture specimen collection may lead to false positive results which culminate in unnecessary antibiotic use that puts the patient at risk for antibiotic resistance. Measures are being initiated by the Center for Disease Control (CDC) to combat antibiotic resistance. Antibiotic stewardship is a part of National Action Plan to improve antibiotic prescribing and use (CDC. 2017). Patient education on proper method of urine culture specimen collection may help to reduce the specimen contamination rate and thereby improve the quality of healthcare.

Background

According to the 1999 report by Institute of Medicine (IOM), the number of people who die each year due to avoidable patient safety errors in the United States is estimated to be 98,000. Different measures have been taken into consideration to increase patient safety and improve quality of health care. The Patient Safety and Quality Improvement Act was signed into law on July 29, 2005, with the goal of improving patient safety and in response to the IOM's report, *To Err is Human: Building a Safer Health System*. There is an emerging concern about patient safety in the United States. Persistent deficiencies in the quality in the U.S. health care system encouraged the Affordable Care Act to expand the use of "pay-for-performance" approaches, particularly in Medicare, to identify designs and programs that are most effective as an initiative aimed at improving the quality, efficiency and overall value of health care. Moreover, the nation expects high quality and high-value attention for its extensive investment of resources to healthcare (Chen, Rosen, Borzecki, & Shwartz, 2016). Hospitals and physicians can benefit from financial incentives upon carrying out performance improvements to achieve optimal outcomes for patients.

It is often a challenge to maintain quality measures and approaches in the midst of patient overcrowding and short staffing primarily in the emergency departments and in acute care settings. Many disease conditions are diagnosed by lab results along with other diagnostic tests. Hence the method of collection of lab specimen is highly significant in response to one's disease management. Healthcare professionals often do not get time to explain the procedure of each step of the lab specimen collection process to the patients, especially in a fast paced emergency department (ED). According to different research studies there is an increase in urine culture specimen contamination rate, especially in ED and acute care settings (Klausing, Tillman, Wright, & Talbot, 2016). Patient education and explanation of the process of urine specimen

collection in a language which is understood by the patients are crucial to getting an accurate result. Due to the fast paced nature of the ED, patients are not often educated enough about their lab tests or collection methods. The standard method of collection of a urine culture specimen is a midstream urine collection. However, the right method of collection of urine culture specimen may not be explained to the patient before the specimen collection process, which results in inappropriate collection of urine culture specimen that often leads to erroneous results and possible repetition of lab tests and/or inappropriate antibiotic treatment.

According to a study to determine the frequency of urine culture contamination rate, conducted by 127 laboratories across the U.S. the median contamination rate of urine culture specimen remains high (overall contamination rate 15%) and shows that providing patient education/instruction is associated with lower contamination rates under specific circumstances (Bekeris, Jones, Walsh, & Wagar, 2008). Repetition of lab tests due to specimen contamination is not cost effective for the institution and false results may lead to inappropriate antibiotic therapy, increased costs, and poor patient outcome. A delay in patient treatment and disposition occurs when there is a need for repeating the lab tests. A case report on a project *Improving Your Laboratory Testing Process* from the AHRQ explains the importance of patient engagement and communication (Kwan et al., 2017). This patient experience survey indicated the need for the systemic use of patient education handouts for commonly ordered lab tests, and to engage patients in conversation about the reason for their diagnostic tests, what results to expect and when (AHRQ, 2016). A framework launched by Center for Medicare and Medicaid (CMS) called “Meaningful Measure” in 2017 aims to improve patient outcome and to ensure patients receive the care needed while avoiding unnecessary tests and procedures. The CMS ensures to

focus on most vital outcome measures to provide high-quality care. According to CMS, overuse of services is estimated to account for nearly \$300 billion expenditures (Goodrich, 2018).

Analytic frameworks for quality assessment by IOM include six aims for the health care system such as safety, effectiveness, patient-centered care, efficient, equitable and timely care. Health care providers need to ensure patient safety by avoiding harm, be effective in providing services based on scientific knowledge and provide patient-centered care by considering patient values and preferences (AHRQ,2016). Moreover, timely care to reduce waits and harmful delays, efficient services to avoid waste of equipment, supplies, and ideas and equitable care which does not vary in quality, helps to channel the healthcare industry to achieve the ultimate goal of healthcare.

Repetition of tests such as urine analysis and urine culture in the ED due to specimen contamination, often causes a delay in treatment, increased waiting room time, extra cost to the institution, reduced patient satisfaction, and inappropriate antibiotic therapy. Even though many studies fail to show the relationship between the method of urine culture specimen and contamination rate, some studies reveal a positive relationship between the process of collecting the culture specimen and the contamination rate (Lau et al., 2007). Adequate patient education on the proper method of obtaining the midstream urine specimen may reduce the contamination rates in the ED. Unnecessary urine analysis and urine culture leads to inappropriate treatment of asymptomatic bacteriuria. Unnecessary antibiotic treatment leads to increases the threat of antibiotic resistance and unsafe therapy to the patients (CDC. 2017).

Needs Assessment

Urinary tract infection (UTI) is one of the most common bacterial diseases encountered in the United States ambulatory care settings and the ED. It is the second most common

indication for antibiotic therapy (Mohr et al., 2016). In addition to the 8.6 million outpatient visits for UTI, one million cases present to the ED (Mohr et al., 2016). The College of American Pathologists' Q-Probes study on urine specimen contamination rate from 127 laboratories shows that laboratories in the 10th percentile had an average contamination rate of 41.7% (Bekeris et al., 2008). This Q-Probes study shows that when written instructions provided in the ED specimen contamination rates for both male and female patients dropped ($p = .01$) and thus emphasize the importance of patient education (Bekeris et al., 2008). Laboratory reports from the project setting, an urban academic hospital, displays an increased rate of contamination of urine culture specimens. The urine culture results shows mixed flora of organisms and the patients are often called back or followed up to repeat the tests. This information is based on daily call backs made to patients by the APN for positive urine culture results (A. Hassan, APN, personal communication, January 10, 2018). A case report by AHRQ (2017) on a recent survey on patient experience indicates the need for the systemic use of patient education handouts for commonly ordered lab tests and to engage patients in conversation about the reason for their diagnostic tests, what results to expect and when, to provide quality healthcare (Kwan et al., 2017). According to the National Institute for Health and Care Excellence (NICE), unnecessary use of tests and antibiotic therapy and the development of antibiotic-resistant urinary tract infections can be minimized by developing simple decision rules, diagnostic guidelines or other educational interventions (NICE, 2017). Based on the day-to-day observation of this issue in the ED and communication with healthcare providers, the primary investigator became aware of the need for patient education on the proper method of collection of urine culture specimen in the ED.

Problem Statement

Improper urine culture specimen collection and misinterpretation of positive results often leads to adverse healthcare events, increased financial burdens, and over-treating of patients with antibiotics which increases the risk of antibiotic resistance (Garcia & Spitzer, 2017). Engaging patients in their healthcare by the explanation of a safe, effective and patient-centered care to the patients is a significant key component to achieving quality care. The purpose of this quality improvement project is to reduce the rate of contamination of urine culture specimens by educating patients about the proper method of collection of urine culture specimens and engaging them in providing their own quality healthcare. Quality care can be achieved when there is representation from people those who get care, who provide care, and who pay for care (Sorain, 2006)

Clinical Question

Does education of (P) adult ED patients who need a urine culture specimen through (I) use of visual aid (animated video demonstration of the steps of the specimen collection process) on the proper method of the collection of clean catch midstream urine culture specimen (O) reduce urine culture specimen contamination rate, (C) as compared to specimen contamination rate prior to the intervention?

PICO

P: Adult female and male patients more than 18 years' old who need a urine culture specimen.

I: Education to patients using visual aid on the proper method of urine culture specimen collection

C: Number of contaminated urine culture specimen pre and post intervention

O: Reduction in number of contaminated urine culture specimen

Aim and Objectives

The aim of this quality improvement project is to reduce the number of contaminated urine culture specimens in the ED by providing adequate and proper education to the patients on the proper method of collection of midstream urine specimen using a visual aid. Instruction using a visual aid allows the patients to understand the process well and encourages them to follow the proper technique in obtaining the midstream specimen. Reducing the contamination rate of urine culture specimens can help the institution to achieve the following goals.

1. To maintain quality measures and improve performance level on urine culture specimen contamination rate.
2. To reduce the ED waiting time by the early disposition of ED patients.
3. Provide appropriate treatment to reduce the risk of antibiotic resistance
4. Enhance patient engagement in their quality healthcare by patient education.
5. Increase patient satisfaction.
- 6.Reduce the cost of repeated lab tests.

The objective of this quality improvement project is to collect baseline contamination rate data prior to introduction of visual aid, to collect data on the specimen contamination rate after the intervention of patient education using visual aids and to compare the pre and post intervention data on the urine culture specimen contamination rate in the ED

According to Aligning Forces for Quality (AF4Q), a Robert wood Johnson Foundation for improving health and healthcare in communities across America, patient's or consumer's engagement is a crucial component to improve healthcare (Sorain, 2006). When patients are told why and how the diagnostic tests are being done, they may tend to comply with the proper method of collecting samples.

Review of Literature

A quasi-experimental study which was done in an urban academic ED "Use of a Midstream Clean-Catch Mobile Application Did Not Lower Urine Contamination Rate" shows no correlation or association with middle stream urine collection instrumental app and urine culture or analysis contamination rate among ED patients (Jacob et al., 2018). Although there is no correlation between the use of mobile app and contamination rate, the researchers highly suggested the need for a high quality study to identify practices that affect the accuracy of the urine specimen. Testing of the knowledge level of the participants before and after watching the instructional application was not done in this study which limited the generalizability of its results. Personalized instruction using a visual aid may help the patients to understand more about the proper method of collection of urine culture specimen.

Another Quality improvement project to evaluate urine culture ordering and collection practice among nurses in two acute care settings, i.e., in the ED and Intensive Care Unit found challenges with following proper urine collection technique in both fast pacing unit and the researchers emphasized the need for future research in this area (Redwood et al., 2018). Barriers included nurse's difficulty in locating physicians to discuss results, problems with nurse-initiated ordering protocol and ineffective communication between nurses and physicians. Other factors which impeded the study were lack of standardized electronic communication tools and patient factors such as not using pre-collection cleansing kits properly.

Another study by the College of American Pathologists on 14,739 urine specimen from 127 laboratories in the U.S. and Canada concluded that urine culture refrigeration and patient instruction on proper collection method is associated with lower contamination rates (Bekeris et al., 2008). Laboratories with poor performance had an average contamination rate of 41.7%. This study explains the significant reduction in contamination rate for specimen from male patients (*p*

= .006) with patient instruction. This study has limitations as the female patients, and male patients were not given the instructions using the same method. Furthermore, contamination rate for both male and female patients dropped with written instructions in the ED ($p = .01$). This supports the significance of patient instructions about obtaining a good specimen.

A retrospective cross-sectional analysis of 19,328 records of outpatient and ED patients in an academic tertiary care institution did a bivariate analysis, and it shows that patients with contaminated urine cultures had high levels of squamous epithelial cells (SEC) than those that were not contaminated (Mohr et al., 2016). 42% ($n = 8,049$) showed culture evidence of urethral contamination. Thirty-two percent of urinalyses showed no evidence of SECs. Some of the records were excluded due to lack of corresponding microscopy results.

This analytical study aimed to determine whether quantitative squamous epithelial cells can predict urine contamination and to define a threshold value of SEC that identifies the contaminated specimen. There is limited teaching or studies which shows the correlation between the presence of squamous cell and urinary contamination. This study concluded with the finding that squamous epithelial cells (SECs) do predict the modestly poor performance of the urinalysis and do not predict contamination. The diagnostic accuracy of urinalysis relies on the assessment of a cleanly collected specimen (Mohr et al., 2016)

Another prospective observational study in a pediatric ED at the Royal Children Hospital, Melbourne, Australia, collected data about the time the specimen was taken, and the diagnostic implication of clean catch urine collection shows significant higher contamination rates in females and a trend towards higher contamination rate in young adults (Tosif et al., 2017). The contamination of a proportion of specimen could not be determined because those specimens were not sent for a culture study. The study concludes with a comment that an ideal method of

reducing contamination rates and obtaining clean catch urine specimen remains elusive (Tosif et al., 2017).

A randomized control trial on women from four antenatal clinics using a navel device to collect midstream urine specimen (Jackson, Dryden, Gillett, Kearney, & Weatherall, 2005) shows significant reduction in specimen contamination rates when a specific urine collection device is used. Prenatal women were randomized into two groups; those who use the conventional method of collecting urine culture specimen and those who use the urine collection device. Midstream specimen collected using the UCD (Urine Collection Device) showed significantly fewer mixed growth samples (9% vs 14%, $p = .001$; which is a 36% relative reduction; Jackson et al., 2005).

A non-experimental retrospective evaluation of the influence of contaminated urine cultures in an inpatient and ED settings of an academic medical center shows the fact that 48.8% of patients who developed complications that were attributed to contaminated urine cultures (Klausing et al., 2016). The retrospective evaluation of 131 patients with contaminated urine cultures during a 12-month period shows that 48.8% (64 patients) experienced complications related to contaminated specimens. The study used 17,006 urine culture specimens, and most of the contaminated specimens were from the ED (Klausing et al., 2016).

Furthermore, another randomized trial which was done in an ED of a tertiary care pediatric center in Montreal, Quebec, Canada to evaluate the effectiveness of perineal cleaning before collection of urine culture specimen in preventing sample contamination using two groups. The results indicate that the group using liquid soap and gauze pads to clean before specimen collection had reduced contamination rates as compared with the group who did not use the cleaning method (Moralejo, 2008). Researchers suggested further studies to clarify

whether it is the cleansing or some other aspect of specimen collection in children that is most important in reducing specimen contamination (Moralejo, 2008).

Report of a performance improvement project on “Urine Specimen Collection: How a Multidisciplinary Team Improved Patient Outcomes Using Best Practices” discussed the negative impact of poor method of urine specimen collection on patient care and described the benefit of executing a multidisciplinary approach to urine collection (Dolan & Cornish, 2013). Current practices do not involve patients in their own healthcare. Encouraging the patients to take initiative in their own healthcare by explaining or instructing the importance of collecting an accurate clean-catch urine specimen correctly and the significance of accurate results can improve the quality of care. The project report emphasized the accurate and standardized collection, transportation and handling of urine specimen to provide the best healthcare outcome for all patients (Dolan & Cornish, 2013).

A review of literature, MEDLINE search on effects of pictorial aids in medication instructions on medication adherence and compliance shows that the use of pictorial aids enhances patient's understanding of the significance of medication compliance and adherence (Katz, Kripalani, & Weiss, 2006). A sub study from a randomized control trial on the efficacy of two different pressurized metered dose inhaler spacer devices shows that repeated video instruction helped to improve inhaler technique in young children (Shaw et al., 2016).

A randomized control study on the efficacy of visual aids in direct to consumer (DTC) prescription drug advertisements shows that visual aids help people recall quantitative efficacy information. 2504 people with high cholesterol are randomized to view a potential DTC print

or television advertisement with no visual aid. The study shows that advertisement with bar chart or table elicited more accurate drug efficacy than those with no visual aid. The study concluded by suggesting the addition of visual aids to DTC advertisement (Sullivan et al., 2016).

A pilot study, at the McMaster University School of Nursing in southwestern Ontario, on the effectiveness of videotape training and hands-on instruction in preparing senior nursing students to respond to emergency clinical situations demonstrated significant improvement in performance by the groups who had video or hands-on instruction (Baxter, Akhtar-Danesh, Landeen, & Norman, 2012). Senior nursing students (n=27) were randomly grouped into three groups; one group with video instruction, the second group received hands-on experience, and the third group got no instructions. Groups who received videotape and hands-on instructions performed significantly better on evaluation using high fidelity simulations ($p = .007$).

Framework

The framework (Appendix B) used in this quality improvement project is Plan-Do-Study-Action mode. The first step (PLAN) has three components, which include

- a Assessing current situation and analyze cause.
 - Increased contamination rate of urine culture specimen
 - False positive urine culture results
 - Call back of patients with positive culture results with mixed flora
- b Defining expected change and method of analyzing the expected outcome
 - Reduction in urine culture specimen contamination rate
 - Increased patient awareness and involvement in their quality healthcare

- Collect and Compare the data on contamination rate pre and post intervention

c Defining the time frame

In the second step (DO), the plans are being carried out.

- i. Patient instruction/education on proper method of collection of clean catch midstream urine specimen
- ii. Demonstration of proper method of collection using a visual aid prior to specimen collection

In third step (STUDY),

- Results were analyzed and evaluated.
- Data on contamination rate of two months prior and two months during the intervention (Patient education) is collected from the microbiology lab and compared.

In the final step (ACT),

- Result can be adopted or rejected based on the evaluation in the third step.
- Integration of intended outcomes into other areas if it is adopted(*Improving Health and Healthcare Worldwide*, 2016)

Methodology

Design of Project

This quality improvement project aims to use a visual aid to provide direct patient education about obtaining a midstream urine culture specimen to reduce the rate of

contamination. The proper collection method of midstream urine specimen for urine culture was explained to the patient before specimen collection using a visual aid. This QI project is planned to help to reduce the rate of contamination of urine culture specimen and to improve the performance quality of the department by ensuring provision of safe healthcare to the patients and lower the number of unnecessary antibiotic treatments. Although mid stream urine specimen (MSU) collection is considered to be an effective method to reduce the specimen contamination, it may be difficult for the patient to adhere to this process without appropriate patient instruction (Maher, Brown, & Gatewood, 2017).

The number of patients who need urine culture study is significantly high due to high volume of patients who present to the ED with complaints of abdominal pain and other medical conditions which need urine culture study as a diagnostic measure. As a general practice, in the ED, all ambulatory patients who are able to collect a urine specimen by themselves are given containers for urine culture study. Due to the fast paced nature of the ED, the collection process may not be explained properly to patients, e.g., how to clean the perineal area, how to collect the mid-void urine and how to handle the specimen after voiding. Moreover, the staff may encounter challenges in communicating to the patients with language barriers. Even though language line and translation services are in effect in the ED it is seldom used to explain small processes like urine culture specimen collection.

During this quality improvement project implementation period, female patients who met the inclusion criteria were given instructions using a visual aid (video) on the proper method of collection of urine culture specimen by the principal investigator before the collection process. The PI did work with the physicians and nurses on the unit to find out who needs a urine culture study. The PI was informed by the providers on the unit when there was a need for urine culture.

The method of midstream urine specimen collection involves,

1. Wash hands with soap and water, rinse and dry.
2. Open all the soap cloths and place them on a clean surface
3. Using the soap cloths, clean the perineal and urethral region with one hand spreading the labia folds, wiping only front to back. Repeat it three times with three soap cloths.
4. Void the first urine
5. Collect the second voided midstream urine in a sterile container provided, avoid cup to skin contact.
6. Cover the container with the lid.

Cleaning the perineal and urethral region using soap wipes, from front to back in female patients is essential and will be explained to the patients. Labia majora and minora should be separated while cleaning.

Patients were given instructions using a visual aid (video) which describes the steps of the method of midstream urine specimen collection prior to the specimen collection process. The PI collected the information about who needs a urine culture study, from the physicians, RNs, and the residents in the ED. Those patients who needed a urine culture study were given detailed instructions on the process of midstream urine specimen collection process using the instructional video describing each step of the process by the PI. Patients with a language barrier were given assistance via translator service for communication. The need and significance of following the instructions and collecting the clean mid-stream void urine were explained to patients. Patients were informed about the need and significance of following the instructions and to collect the clean mid stream void urine. Patients were given an opportunity to recite back

the steps of the specimen collection process and the PI collected the specimen and the labelled specimen were sent to the lab immediately.

Study Setting

This quality improvement project took place in the ED of an urban, level one trauma, hospital, in Newark, NJ. The hospital is located in the center of a populous city of United States, Newark, in Essex County, NJ. According to the United States Census Bureau (2017), Newark city has a population of 281,764. Newark city is the largest municipality in New Jersey by population. 50.5% of the population is female. Newark city has residents of diverse race and ethnicity. The majority of residents are Black or African American (50.2%) with 24.4% white, 0.5% American Indian/Alaska native, 1.8% Asian, and 33.8% Hispanic or Latino. The median house hold income of Newark city is estimated to be 34,387 and the percentage of persons without health insurance under the age of 65 years is 26.9%.

The study setting ED provides health care to all patients who come to the ED regardless of their ability to pay or the insurance status. Therefore, people from different ethnicity and demographics are treated here. The average census of this ED is around 250 patients per day (Dr. Gang. M. Vice chair of safety and quality, personal communication, April 4, 2018). Patients are evaluated and treated in different areas of this ED, depending on their disease acuity level (classified on a scale of one to five, with one being the highest acuity, and five being the lowest acuity). This ED consists of one level one trauma room; one main room where all patients of acuity three, two and one are treated; one fast track department where patients who are ambulatory and with acuity level four and five are treated; one mid-track room where ambulance patients are triaged, evaluated and quickly treated if necessary; one psychiatric unit where all patients with acute psychiatric symptoms are treated; and one pediatric unit where all

patients under the age of 21 years are treated. This QI project will particularly focus on ED main room patients and fast track patients who need a urine culture study. According to the U.S. Census Bureau (2017), 26.9% of the Newark, NJ population consists of females under the age of 65 years. There are a high number of patients, especially female middle-aged patients, who come to the emergency room daily with urinary complaints or abdominal pain who may require urine culture studies. A random analysis on number of urine culture studies done in one week in the emergency department, by the director of microbiology department shows that the average number is approximately 65 (F. Starrett, personal communication, May 21, 2018)

The proposed study setting has 519 licensed beds and 3,205 total employees. The ED visits per year are around 90,000 (89,978 as per 2015 annual report; 2015). The general population often depends on the emergency department for even minor problems instead of visiting primary care offices. Hospital's Emergency Medical Services cover Newark, Camden, Newark Liberty International Airport and Port Newark (University Hospital, 2015). This hospital has served as a charity care healthcare center for many years.

The proposed study setting may have the highest patient acuity level in the state (University Hospital, 2015). This proposed clinical setting often gets the sickest and most complex medical cases as it is the level 1 trauma center of northern New Jersey and a regional referral center for the most complex medical cases. This Hospital's CMI (Case Mix Index) is substantially higher (1.64) than the average for all New Jersey hospitals (1.34; University Hospital, 2015).

Study Population

The study population includes all adult female ambulatory patients aged 18 years and above who need a urine culture study. Inclusion criteria of study population are those patients

who were able to ambulate to the rest room and collect urine culture specimen by themselves and they were able to follow the instructions and understand the need for collecting a clean mid void urine.

Study Interventions

Patients who need urine culture studies were given education using the visual aid demonstrating the steps of the specimen collection process. Information regarding this quality improvement project was circulated to all the RNs, residents, APNs and the doctors through verbal communication and awareness flyer prior to the implementation time. The Nursing Director of the ED, and the Vice Chair of Emergency Medicine, have been informed and they agreed to support the project. An email from the Nursing Director of the ED or the Vice Chair of Emergency Medicine was used to inform the department about this quality improvement project. The University Hospital Microbiology Department Supervisor was also notified about the project. Apart from the emails from the department heads, a laminated information tool (Appendix D) was circulated in the unit to make everyone aware of the project implementation. The IRB approval was granted (Appendix E). The PI received the help of the staff and physicians to recognize the patients who need urine culture specimens. The sample included female patients who meet the inclusion criteria. Patients who are unable to ambulate, unable to follow instructions, patients who manifest acute psychiatric symptoms, or are developmentally delayed, with cognitive impairment, were excluded. This QI project continued for two months (10/21/2018 to 12/10/2018). The project timeline is depicted in Appendix F.

Patients who met the criteria for inclusion were given a one minute educational /instructional session on the proper method of collection of midstream urine specimen for urine culture study before the actual collection process by the PI using a visual aid (Video). Each

patient who needed a urine culture study was approached by the PI and informed about the process. Consent from the patient (Appendix G) is waved as per IRB. After the education, patients' level of understanding was assessed by asking them to recite the steps of the process. Patients were given urine culture specimen collection kit which includes a sterile specimen collection container and cleaning soap wipes. After the collection process, the specimen was sent to the lab by the PI to avoid the delay in transporting the specimen to lab. Data on urine culture specimen contamination rates on the days of intervention was gathered using patient medical record number. The intervention continued for two months. The PI was present two days a week at the proposed setting from 9 am to 7pm to carry out the study intervention. The medical record number, date and time of the intervention were recorded to retrieve data from the microbiology lab. The collected data on the specimen contamination rate on those specific days were compared with those prior to the study intervention.

Outcome Measures

In this quality improvement project, the participants were patients who needed a urine culture study. Patient education on the specimen collection process were enhanced by the visual aid (Video) demonstration of the steps of the process. The patient was informed about the purpose of this QI project. Participants' personal information was not gathered by the PI for this project. The PI did record the medical record number to be used for result review from the microbiology lab. Monitoring the medical record number, date and time of the study intervention allowed the PI to collect data on urine culture specimen contamination rate from the microbiology lab during data collection time. The implementation (Table. 1) and evaluation

record (Table. 2) used to monitor the study intervention is depicted in Appendix H. These records were used to collect the data on rate of specimen contamination.

Benefits/Risks

There are minimal risks involved in this QI project. The subject's identity or information was not collected by the PI. If the subjects felt uncomfortable to follow the steps of the process due to their severity of illness or their state of psychological stress, they were not included in the study. The benefit of this QI project outweighs the risks. Through the proper collection process of urine culture specimen, proper treatment may be ensured. It may help to reduce unnecessary antibiotic treatment and thereby reduce antibiotic resistance. It may also reduce time in the ED and need for a repeat culture study. This QI project is expected to bring positive changes i.e., reduction in the number of urine culture specimen contamination rate in the ED of the proposed setting through direct patient education using visual aid demonstrating the steps of the specimen collection process. Furthermore, the positive results will eventually help to translate the knowledge into practice in the ED.

Subject Recruitment

Convenience sampling method was used in this QI project. The subjects for this QI project were adult female patients 18 years or older who needed urine culture study. The subjects were identified with the help of physician, nurses and APNs in the unit, who informed the PI about the need for urine culture study. The PI then approached the patients, determined the inclusions criteria was met, and explained the study purpose. The patients were given the education on proper method of mid-void urine collection using a visual aid. The providers, registered nurses, residents and medical technicians at the unit were aware of the QI project. The PI was stationed in the ED, two days a week from 9 am to 7 pm to carry out the project.

Consent Procedures

A short form of consent to participate in research was prepared to obtain from each patient. As per IRB, consent form is waived and the patients were instructed about the purpose and the anticipated result of this QI project. A copy of the consent form is attached.

Subject Cost and Compensation

There was no additional cost involved for the subjects to participate in this QI project. Subjects were already patients who were being treated in the ED. The PI was adapting a new methods of education to the patients on the proper method of collecting the mid-void urine specimen. It is nursing's responsibility that patients are given proper education on the procedures. The PI used a different means of educating the patients using a visual aid of the steps of the collection process.

Project Timeline

The estimated time to receive IRB approval was summer 2018. The implementation began during fall of 2018 for a period of two months. The PI could carry out the project as per the anticipated project timeline. Complete timeline of the project is depicted in Appendices.

Budget

The estimated and actual budget for the project is presented in Appendix I. There is a minimal cost applied to carry out this QI project. The DNP candidate volunteered to work part time (20 hours per week) to implement the project, but did not expect to receive any prorated payment for her services. There is no direct incurred cost to the hospital. The expense for making

the animated video was \$315, which was absorbed by the PI. The cost of flyers for the awareness of this QI project at the unit was \$10. The PI used an iPad to show the patients animated video demonstrating the process of urine collection. The sterile specimen collection containers were already in use at the emergency department for urine culture specimen collection. This QI project expense was absorbed by the PI.

Evaluation Plan

Data Maintenance and Security

A unique code was assigned to each patient who received video-guided instruction on midstream urine collection method. The medical record number was used to retrieve the urine culture results, and a number code is used to de-identify it. The principal investigator removed all personal identifiers of the study participants for a de-identification purpose. All this information is stored in a password-protected device.

Data Analysis Plan

Two types of data were obtained in this QI project. The specimen contamination rate/urine culture results for two months was obtained from the microbiology lab and was compared with the percentage of contamination during the implementation period. The PI recorded patient's medical record number(MRN) who received the video instruction to retrieve urine culture results. The percentage of the rate of contamination is calculated before the implementation period and during the implementation period to know the significance of video instruction on reducing the rate of specimen contamination. The percentage of specimen contamination during the two periods was compared to study the impact on specimen contamination rate with the use of visual aided patient

education.

Recommendations and Discussion

Economic/Cost Benefit of Project

This proposed quality improvement project was expected to cause reduction in the rate of contaminated urine culture specimen and thereby may reduce number of urine culture repetition. Each sterile specimen container cost around \$2.35. The cost of test repetition can be saved with reduced specimen contamination rate. In an ED practice, an APN does the call back for all ED patients who have been discharged yet have positive culture results, either to repeat the test or to come back to the ED. Personnel and time resources can be used effectively with reduced specimen contamination rate. ED patients who wait on repeat urine culture results cause delay in ED throughput and increases in waiting room time. Moreover, when patients are asked to repeat the specimen collection process to repeat the study, it may cause negative impact on patient satisfaction.

Impact on Healthcare Quality/Safety

Interpretation of urinalysis and urine culture results are limited by specimen contamination. Over-diagnosis and subsequent treatment of UTI is a common problem which leads to the practice of overprescribing antibiotics and thereby increasing the healthcare challenge of antibiotic resistance. In addition, inappropriate antibiotic utilization increases healthcare costs (Schulz, Hoffman, Pothof, & Fox, 2016). Although patient instruction using a visual aid(video) may be resource intensive, this method may increase the adherence and reduce specimen contamination.

Policy Implication

Patient education is a significant component of preventive healthcare. Nurses are responsible for providing adequate education on any procedures/tests being done for the patient. Due to the fast paced nature of the ED, often it is not feasible to provide a thorough patient education. Because a picture is worth a thousand words, any written instruction/visual aid may aid to gain the benefit of patient understanding. Patient participation in their own care is significant in today's healthcare. Participatory health which is grounded on patient engagement is a simple concept with powerful implications in present healthcare (Coughlin, Roberts, O'Neill, & Brooks, 2018).

Translation

Although patient education/instruction is very significant for quality healthcare, it takes time to provide proper patient education/instruction. The anticipated effect (reduction in specimen contamination rate) of this quality project can be translated into practice in the ED with the help of technology. Each patient who needs a urine culture study can be approached by the primary nurse or medical technician and given the instructions with the use of computer on wheel (COW) which is available to each nurse or medical technician. This evidence based practice can be used in other areas of the hospitals such as medical surgical floor, observation floor and telemetry floors. Monthly departmental quality analysis information on specimen contamination rate can be discussed in monthly staff meeting to make all the staff aware of the performance level.

Dissemination and Professional Reporting

The findings of this quality improvement project will be shared at the Doctor of Nursing

Practice project presentation. The results will be shared at the hospital level. The microbiology department of the hospital (University Hospital, Newark) will be notified of the results. This QI project can be published in ENA conference/journal. Translation of knowledge can be achieved by incorporating the use of patient education video at the hospital level.

Data Analysis

This QI project was carried out as a pilot study for eight weeks (10/21/18 - 12/10/18) in the study setting. The PI stationed in the ED two days a week from 9 am to 7 pm to provide patient education, using a visual aid(video), to patients who met the inclusion criteria. The PI, using the implementation tool, collected information on patients who were given video instruction. The information collected by PI were medical record number, reason for ED visit and age of the patient. A total of 83 patients who met the inclusion criteria were given video instruction using a convenience sampling method during the pilot study period. The urine sample of patients who received the video education was sent to the lab and the medical record numbers were recoded by the PI to track the results. Urine culture results of patients who were given video instruction was gathered during the period of data analysis and the MRN number was de-identified using random numeric identifiers.

Additional data obtained from microbiology lab were urine culture results of selected ED patients (female patients 18 years and above) for two months prior to the pilot study (August & September 2018) as well as the data from the eight weeks that the project was carried out (10/21/18 - 12/10/18). During the pre-study period from 08/01/18 to 09/30/2018, 318 urine cultures studies were completed, and 74 of them were contaminated (23.27%) The number of urine culture studies completed during the pilot study period was 469 and 105 specimens were contaminated (22.38%) (Figure 1). The primary investigator provided video education to 83

patients who met the inclusion criteria during the eight weeks of the pilot study, and 15 of those specimens were contaminated (18.07%) which includes the total number of specimen (469) collected during the pilot study period (Appendix K Table 1). The table describes the difference in rate of specimen contamination for patients who received video instructions as opposed to those who did not receive the instruction.

The rate of specimen contamination during pre and during study was analyzed, and it was found that the specimen contamination during the pilot study period (22.38%) was lower than the pre-study period (23.27%). Baseline data for this quality improvement project was derived from the laboratory reports on urine culture results from the study setting which displayed a specimen contamination rate of 20.3%. Contaminated specimens were labelled as specimens with mixed flora of organism in culture results as opposed to "no growth" or colony count of a specific organism. This high rate of contamination led to patient call back to repeat lab testing.

Although it was not possible to analyze the statistical significance of this QI project as the pre-study and data during the pilot study are not identical, the rate of specimen contamination during two periods was analyzed. A generalized comparison of the rate of specimen contamination during the two periods were utilized. The rate of contamination during the pilot study was lower in comparison to the pre-study period. Though the rate of specimen contamination of patients who were given video instruction remains high (18.07%), there is a reduction in the rate of specimen contamination during the pilot study period compared to pre study period. There is a small reduction in the rate of specimen contamination during the period of pilot study in comparison with specimen contamination rate before the pilot study (Figure.1). Due to lack of homogeneity of the data, a statistical significance of this study could not be

determined. The sample included in the pre-study data might not necessarily met the inclusion criteria. Therefore, the PI was only able to provide the percentage of contamination during the two periods.

The chief complaints of patients who were given video guided instruction were gathered and analyzed. Most of the patients who received video instructions were those who had abdominal pain as the chief complaint (59.03%). Eleven patients (13.25%) came with complaints of dysuria and seven (8.43%) patients with flank pain. 19.27% came with unspecified complaints (Appendix K Table.2).

Discussion

This QI project demonstrated that provision of a short video instruction might have resulted in a decrease in urine specimen contamination rate in the ED and thereby reducing the financial burden and time spent on unnecessary repeat diagnostic testing. This reduction benefits the ED by limiting the number of patients who must be called back to repeat the test. The cost of test repetition is reduced resulting in cost saving and this financial gain can then allow the institution to better allocate its budget on other necessary improvements. Moreover, it was also found that patients were very receptive and gratified to get detailed instruction using the video except for two people. Two patients responded unfavorably to the use of video instruction, who did not think it was necessary. Uncontaminated urine specimens allow for accurate diagnosis and quality treatment. Though there is a reduction in specimen contamination rate during the pilot study period, it cannot be stated that this QI project meets the objective of reducing the specimen contamination rate in the ED by providing video instruction.

Barriers to implementing the project included unavailability of area space conducive for video instruction due to ED overcrowding and patients being placed in the hallways. Additional

barriers included the unsanitary restroom, shortage of environmental service staff and lack of ED staff awareness of the project being conducted. The video education tool was unique because its Spanish voice over feature made it easy to overcome the language barrier with Spanish speaking patients. Use of language interpreter service and Spanish voice-over in the video helped to address the language barrier.

Patient education may not be the only factor which determines the specimen contamination rate. The other factor that is necessary to note is without patient readiness to learn and follow instructions, the specimen contamination rate will likely be affected. Patient's readiness to learn and follow instructions depends on their presenting health condition. If a patient is presenting with moderate-severe pain, they may be less likely to listen to or watch the video instruction.

Study Implication/Recommendations

This project could not demonstrate the impact of video instruction in reducing the rate of contamination of urine culture specimens obtained in the ED due to the lack of a statistically significant result. However, the reduced rate of contamination during the study period can be considered as a possibility for positive study implications. The implications of decreasing the rate of contamination include: efficient access to clinically meaningful results, reduced patient inconvenience from provision of a repeat specimen, and reduced costs to the organization due to reduced need for re-testing. Effective patient education helps in patient engagement in their own health care. The idea of video-guided patient instructions can be incorporated into many healthcare settings especially in outpatient areas. As the old adage goes, "A picture is worth a thousand words," but in this case so does a video! The PI recommends the use of homogenous data to analyze the

study for statistical significance in future. Limitations for this study includes use of heterogeneous data and inability to use the inclusion criteria in retrospective data from pre-study period.

Sustainability of this QI project

The use of video instruction for patient education can be incorporated into different areas of healthcare to improve quality and patient satisfaction. This evidence-based practice can be used in other areas of the hospitals such as the medical-surgical floor, observation floor, and telemetry floors. Monthly departmental quality analysis on urine specimen contamination rate can be discussed in a monthly staff meeting to make all the staff aware of the department's performance level. The PI presented the results of this study to the Nursing Research Council of the study site to discuss the incorporation of the patient education video on midstream urine specimen collection for use hospital-wide.

Conclusion

Patient instruction using a visual aid (video) on how to collect a clean midstream urine specimen in an urban academic hospital ED was done to meet the objective of reducing the urine culture specimen contamination rate and thereby reduced the callback time. Although the PI could achieve a minimal reduction in the rate of contamination during the pilot study period, other factors and barriers need to be considered to determine the significance of using a patient educational video on reducing the specimen contamination rate in the ED.

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Appendices

Appendix A

Problem Statement & Evidence Table

Table 1. **EBP Question.**

Does education of (P) adult emergency department patients who need urine culture through (I) use of visual aid (animated video demonstration the steps of specimen collection process) on proper method of collection of clean catch midstream urine culture specimen (O) reduce urine culture specimen contamination rate, (C) as compared to specimen contamination rate prior to the intervention?

P: Adult female and male patients more than 18 years' old who need urine cultures.

I: Education to patients using visual aid on the proper method of urine culture specimen collection.

C: Number of contaminated urine culture specimen pre and post intervention

O: Reduction in number of contaminated urine culture specimen

Table 2. Evidence Table

Article #	Author & date	Evidence Type	Sample size & setting	Study findings that help answer the EBP Question	Limitations	Evidence type & Quality
1.Reducing unnecessary culturing: a system approach to evaluate urine culture ordering and collection practice among nurses in two acute care settings.	Robert Redwood et.al Jan 8. 2018	Non experimental, Qualitative improvement project	ED & ICU nurses in an Acute care setting	Researches found challenges with following proper urine collection technique in both fast pacing unit and emphasized the need for future research in this area.	Limitations of this study is the small sample size, and the result is derived from a single institution. Participants are conveniently selected so it creates the risk of selection bias.	III and
2. Urine culture contamination A college of American Pathologists Q-Probes study	Leonas G. Bekeris MD et.al Jan 8.2008	Qualitative	14739 urine specimen from 127 laboratories in USA and Canada.	A college of American Pathologists' Q Probes study shows that urine culture specimen refrigeration is associated with lower contamination rate. Patient instruction on proper collection method is also associated with lower contamination rates.	In this study female patients and male patients are not given instructions in similar method	III & C
3. Use of a midstream clean catch mobile	Mary Jacob et al. Jan 1.2018	Quasi Experimental	Urban Academic ER. # 257	The study results show that there is no	The study did not test the knowledge acquisition from	II & G

application did not lower urine contamination rates.				correlation/ association with middle stream urine collection instrumental app and urine culture or analysis contamination rate among ER patients. Researchers suggested the need for high quality study to identify practices that affect the accuracy of urine specimen.	their intervention by asking knowledge based questions before and after watching the instructional application. Subjects were not randomized to the intervention. Generalizability of the results is limited since the study was only conducted in one ED.	
4. Clean catch urine collection: Time taken and diagnostic implication	Shidan Tosif et.al. 2017	A prospective observational study	Pediatric Emergency department in Royal Children Hospital, Melbourne. Australia	As per the study discussion, there was a significantly higher contamination rates in females and a trend towards higher contamination in young adults. Study concludes with a comment that “an ideal method of reducing contamination rates and obtaining clean catch urine in a timely manner remains elusive.	The study was conducted in a single tertiary pediatric Ed setting. Contamination of a proportion of specimen could not be determined because they were not sent for lab culture. Did not measure the preparation time taken prior to commencement of urine collection.	II & G

5. A navel midstream urine collection device reduces contamination rates in urine culture.	Jackson S.et al. 2005	Randomized control trial	Women from four antenatal clinics. # 2823	This study compared the contamination rate of urine specimen, which is collected using a novel urine collection device that automatically collects a midstream urine and conventional mid stream urine samples. The study concluded with the fact that the urine collection device (UVD) reduced contamination rates in urine sample.	This study was limited to women predominantly aged 20–35 years.	I & Hi Quality
6. The influence of contaminated urine cultures in inpatient and Emergency department settings.	Benjamin Klausing et al.	Non Experimental, retrospective evaluation	Academic medical center , inpatients and emergency department	As per the study result, 48.8 % of patients developed complications that were attributed to a contaminated urine culture. Researchers suggest future prospective studies to validate their findings, identify means to reduce contaminations as the study	Study was limited to only emergency patients, not all outpatients and it was relatively small sample size. There was no gold standard to distinguish contamination from true infection. The study did not get data on specific methods on	Level 11 good.

				illustrated that urine culture contamination leads to unnecessary testing, treatment and adverse events.	specimen collection	
7.Cleaning of the perineal/ genital area before urine collection from toilet trained children	Donna Moralejo	Randomized controlled Trial	Emergency department of a tertiary care pediatric center in Montreal, Quebec, Canada. # 350	This cluster randomized controlled trial to evaluate “does cleaning of the perineal/ genital area before collection prevent sample contamination”. Two groups were in the study. Groups using liquid soap and gauze pads to clean before specimen collection has reduced contamination rates that the group who do not use the cleaning. Study concluded with a suggestion that future research is needed to clarify whether it is the cleansing or some other aspect of	A larger sample size is required to assess the effects in boys (who had fewer contaminated specimens) and in younger children.	Level I c High qu

				specimen collection in children that is most important in reducing contamination.		
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Non – Research piece of Evidence for EBP question

Article #	Author & Date	Evidence Type	Sample, Sample Size, Setting	Study findings that help answer the EBP Question	Limitations	Evidence Level & Quality
1. Urine specimen collection: How a multidisciplinary team improved patient outcome	Vickie J. Dolan & Nancy E. Cornish	Performance improvement project	350 bed community hospital	This performance improvement project emphasized the importance of patient education on “How to collect a clean catch specimen”. Patients are given clear	Limitations are not stated.	Level V

				instructions with pictures on how to collect clean catch midstream specimen for urine culture.		
2. How and when nurses collect urine cultures on catheterized patients: A survey of 5 hospitals	Karen Jones.,Jehad Sibai., Rebecca Battjes.,Mohammed G. Fakih	A survey of five hospitals	394 nurses from 5 different hospitals completed a 40 question survey	The study concluded that process related to obtaining urine cultures are critical to efforts related to reducing CAUTI and promoting appropriate antimicrobial use. Proper process of obtaining specimen is needed to reduce contamination risks.	It was not an evaluation of nurses actual practice of collection method. Unable to control for potential nonresponse bias. Might need replication in other settings to solidify its external validity.	Level IV with high quality

Appendix B

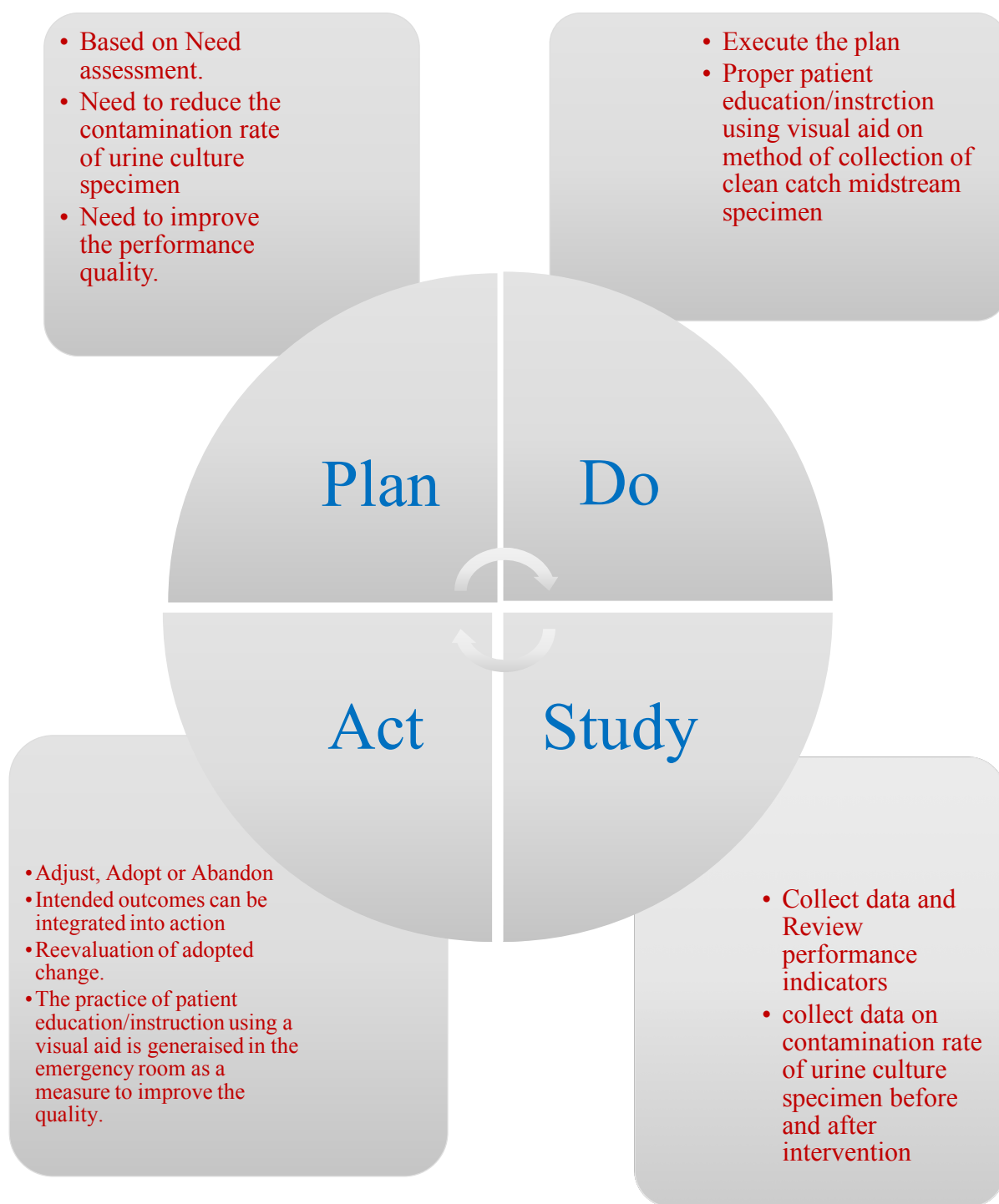


Figure 1. PDSA (Plan Do Study Act) model framework illustrates the different components used in the quality improvement project.

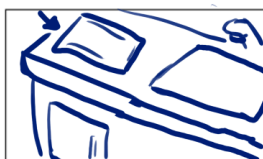
Appendix C

Visual aid for Patient Education

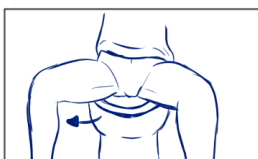
Patients were given instruction on the steps of mid stream urine collection method to collect clean catch specimen for urine culture, using an animated video. The video is created including all the steps of the process. The video was professionally made and validated by University Hospital, Newark, NJ Nursing research council and evaluated by Project chair Dr. Kamienski, Mary PhD APRN FAEN FAAN CEN.



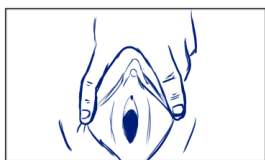
1. Wash your hands with soap and water. Rinse, and then dry.



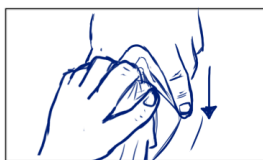
2. Open all towelettes and place them on a clean surface within reach.



3. Sit comfortably on the seat and swing one leg to the side as far as possible.



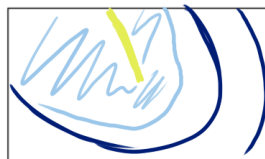
4. With one hand, spread the labia folds and keep them spread throughout the cleansing and specimen collection.



5. Wash the urinary opening area using 3 soap towelettes; use one at a time wiping only front to back between the folds of skin.



6. Rinse with one sterile saline towelette using front to back motion.



7. Void a small amount of urine into the toilet.



8. Collect a portion of the urine in the specimen container. Keep fingers away from the rim and inner surface of the container.





UNIVERSITY HOSPITAL

Newark, New Jersey



QI project to reduce the urine culture specimen contamination rate in the ER.



If there is any urine culture study order for any patients in the ER, please Inform Mrs. Jooly Koshy RN, BSN

Contact: Mrs. Jooly Koshy RN, BSN

Cell #: 732 644 4858

Appendix E

Rutgers IRB Approval



RUTGERS | eIRB

Hello, JOOLY KOSHY ▾

My Inbox	eIRB Home	IRB Studies	User Profiles
IRB Studies > Reducing urine culture specimen contamination rate by patient education using a visual aid-A quality improvement project			
<< Return to Workspace		< Prev	1 / 16 Next >

Activity Details (Study : Letter Released) Submit Letter for Committee Chair approval

Author: Apryl Hamid (Institutional Review Board (IRB))

Logged For (Study): Reducing urine culture specimen contamination rate by patient education using a visual aid-A quality improvement project

Activity Date: 8/27/2018 3:06 PM

Activity Form	Property Changes	Documents	Notifications								
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #f3f3f3;"> <th style="width: 25%;">Job Name</th> <th style="width: 35%;">Subject</th> <th style="width: 25%;">Recipients</th> <th style="width: 15%;">CC Recipients</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;">Rutgers University eIRB: Study Approved</td> <td style="vertical-align: top;"> <i>This subject was generated by script and therefore could be different for each recipient.</i> <i>Here is an example rendering for recipient JOOLY KOSHY:</i> "Rutgers University eIRB: Study Approved" </td> <td style="vertical-align: top;"> JOOLY KOSHY (School of Nursing (SN)) email:jpm387@sn.rutgers.edu </td> <td style="vertical-align: top;"> Apryl Hamid (Institutional Review Board (IRB)) email:ajanuary@ored.rutgers.edu </td> </tr> </tbody> </table>				Job Name	Subject	Recipients	CC Recipients	Rutgers University eIRB: Study Approved	<i>This subject was generated by script and therefore could be different for each recipient.</i> <i>Here is an example rendering for recipient JOOLY KOSHY:</i> "Rutgers University eIRB: Study Approved"	JOOLY KOSHY (School of Nursing (SN)) email:jpm387@sn.rutgers.edu	Apryl Hamid (Institutional Review Board (IRB)) email:ajanuary@ored.rutgers.edu
Job Name	Subject	Recipients	CC Recipients								
Rutgers University eIRB: Study Approved	<i>This subject was generated by script and therefore could be different for each recipient.</i> <i>Here is an example rendering for recipient JOOLY KOSHY:</i> "Rutgers University eIRB: Study Approved"	JOOLY KOSHY (School of Nursing (SN)) email:jpm387@sn.rutgers.edu	Apryl Hamid (Institutional Review Board (IRB)) email:ajanuary@ored.rutgers.edu								

Appendix F

Project Timeline

Need Assessment	Dec 2017						
Project Development & Meeting with stakeholders		Jan 2018-May 2018					
IRB application and approval			May 2018-Aug 2018				
Implementation & meeting with stakeholders				Sept 2018-Nov 2018			
Data collection & Evaluation					Oct 2018-Dec 2018		
Data Analysis, synthesis & Storage						Jan 2018-March 2019	
DNP project poster presentation, Data Dissemination, Submission							April 2019 May 2019



UNIVERSITY HOSPITAL

Newark, New Jersey

Consent to Participate in Research

You are being asked to participate in a research study.

Before you agree, the investigator must tell you about (i) the purposes, procedures, and duration of the research; (ii) any procedures which are experimental; (iii) any reasonably foreseeable risks, discomforts, and benefits of the research; (iv) any potentially beneficial alternative procedures or treatments; and (v) how confidentiality will be maintained.

Where applicable, the investigator must also tell you about (i) any available compensation or medical treatment if injury occurs; (ii) the possibility of unforeseeable risks; (iii) circumstances when the investigator may halt your participation; (iv) any added costs to you; (v) what happens if you decide to stop participating; (vi) when you will be told about new findings which may affect your willingness to participate; and (vii) how many people will be in the study.

If you agree to participate, you must be given a signed copy of this document and a written summary of the research.

You may contact Mrs. Jooly Koshy at 732 644 4858 any time you have questions about the research.

You may contact Mrs. Jooly Koshy at 732 644 4858 if you have questions about your rights as a research subject or what to do if you are injured.

Your participation in this research is voluntary, and you will not be penalized or lose benefits if you refuse to participate or decide to stop.

Signing this document means that the research study, including the above information, has been described to you orally, and that you voluntarily agree to participate.

signature of participant date

signature of witness date

RESERVED FOR IRB APPROVAL STAMP
DO NOT REMOVE

Appendix H



Rutgers School of Nursing
Stanley S. Bergen Building
Rutgers, The State University of New Jersey
65 Bergen Street
Newark, NJ 07101-1709

Table. 1. Implementation Record

Date	Time	MRN #	Comments

Table. 2. Evaluation Record

Date	Time	MRN #	Urine Culture Result	Comments

Appendix I**BUDGET****Expense**

Item	Expense
Material Printing	\$10.00
I Pad	\$500.00
Video making software	\$315.00
TOTAL	\$825.00

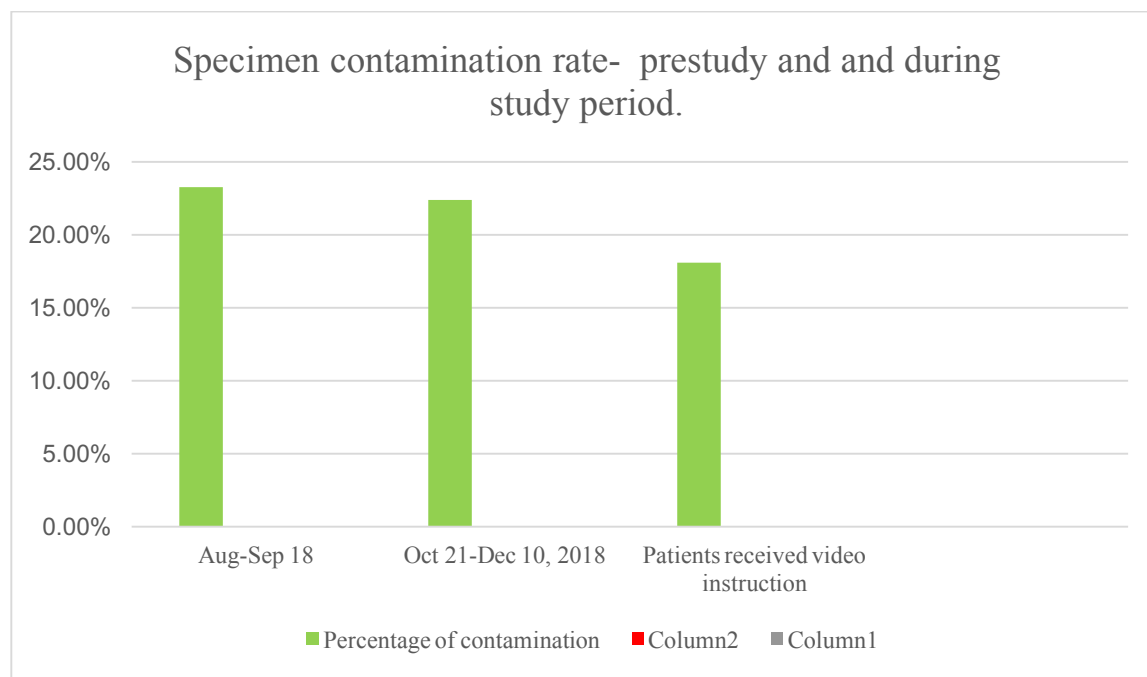
Appendix J

Figure 1. Two months' contamination rate- Pre study period and During pilot study

Appendix K

Table 1. *Contamination rate during pilot study period*

	Contaminated	Clean	Total
Video Instruction	15 (18.1%)	68	83
No video instruction	90 (23.31%)	296	386

Table 2. *Contamination rate case specific*

Complaints	contaminated	clean
Dysuria	1 (9%)	10 (90.9%)
Flank pain	0	7(100%)
Nonspecific complaints	6 (37.5%)	10 (62.5%)
Abdominal pain	16 (32.65%)	33 (67.34%)

Appendix M



Completion Date 16-Apr-2018
Expiration Date 15-Apr-2021
Record ID 22789664

This is to certify that:

JOOLY KOSHY

Has completed the following CITI Program course:

Human Research

(Curriculum Group)

IRB Members and Professional HSP / IRB program staff - Biomedical

(Course Learner Group)

2 - Refresher Course

(Stage)

Under requirements set by:

Rutgers- The State University of New Jersey (All Campuses)

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w93f8b5b9-7010-48e0-aa39-62b44a217a35-22789664

COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)

COMPLETION REPORT - PART 1 OF 2 COURSEWORK REQUIREMENTS*

* NOTE: Scores on this [Requirements Report](#) reflect quiz completions at the time all requirements for the course were met. See list below for details. See separate Transcript Report for more recent quiz scores, including those on optional (supplemental) course elements.

- **Name:** JOOLY KOSHY (ID: 4367988)
- **Institution Affiliation:** Rutgers- The State University of New Jersey (All Campuses) (ID: 757)
- **Institution Email:** jmathew@uhnj.org
- **Institution Unit:** ER

- **Curriculum Group:** Human Research
- **Course Learner Group:** IRB Members and Professional HSP / IRB program staff - Biomedical
- **Stage:** Stage 2 - Refresher Course

- **Record ID:** 22789664
- **Completion Date:** 16-Apr-2018
- **Expiration Date:** 15-Apr-2021
- **Minimum Passing:** 80
- **Reported Score*:** 100

REQUIRED AND ELECTIVE MODULES ONLY	DATE COMPLETED	SCORE
SBE Refresher 1 – History and Ethical Principles (ID: 936)	23-Jan-2018	2/2 (100%)
SBE Refresher 1 – Federal Regulations for Protecting Research Subjects (ID: 937)	23-Jan-2018	2/2 (100%)
SBE Refresher 1 – Informed Consent (ID: 938)	23-Jan-2018	2/2 (100%)
SBE Refresher 1 – Defining Research with Human Subjects (ID: 15029)	23-Jan-2018	2/2 (100%)
SBE Refresher 1 – Privacy and Confidentiality (ID: 15035)	23-Jan-2018	2/2 (100%)
SBE Refresher 1 – Assessing Risk (ID: 15034)	23-Jan-2018	2/2 (100%)
SBE Refresher 1 – Research with Prisoners (ID: 939)	23-Jan-2018	2/2 (100%)
SBE Refresher 1 – Research with Children (ID: 15036)	23-Jan-2018	2/2 (100%)
SBE Refresher 1 – Research in Educational Settings (ID: 940)	12-Feb-2018	2/2 (100%)
SBE Refresher 1 – International Research (ID: 15028)	26-Feb-2018	2/2 (100%)
Biomed Refresher 2 – History and Ethical Principles (ID: 511)	26-Feb-2018	3/3 (100%)
Biomed Refresher 2 – Regulations and Process (ID: 512)	26-Feb-2018	2/2 (100%)
Biomed Refresher 2 – Informed Consent (ID: 514)	26-Feb-2018	3/3 (100%)
Biomed Refresher 2 – SBR Methodologies in Biomedical Research (ID: 515)	27-Feb-2018	4/4 (100%)
Biomed Refresher 2 – Genetics Research (ID: 518)	27-Feb-2018	2/2 (100%)
Biomed Refresher 2 – Records-Based Research (ID: 516)	19-Mar-2018	3/3 (100%)
Biomed Refresher 2 – Populations in Research Requiring Additional Considerations and/or Protections (ID: 519)	19-Mar-2018	1/1 (100%)
Biomed Refresher 2 – Research Involving Prisoners (ID: 520)	09-Apr-2018	2/2 (100%)
Biomed Refresher 2 – Research Involving Children (ID: 521)	09-Apr-2018	3/3 (100%)
Biomed Refresher 2 – Research Involving Pregnant Women, Fetuses, and Neonates (ID: 522)	16-Apr-2018	2/2 (100%)
Biomed Refresher 2 – FDA-Regulated Research (ID: 524)	16-Apr-2018	3/3 (100%)
Biomed Refresher 2 – HIPAA and Human Subjects Research (ID: 526)	16-Apr-2018	5/5 (100%)
Biomedical Refresher 2 - Conflicts of Interest in Human Subjects Research (ID: 17545)	16-Apr-2018	5/5 (100%)
How to Complete the CITI Refresher Course and Receive a Completion Report (ID: 922)	16-Apr-2018	No Quiz

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid Independent Learner.

Verify at: www.citiprogram.org/verify/?kcb580056-6d9e-42b0-a79e-b3b86549fed0-22789664

Collaborative Institutional Training Initiative (CITI Program)

Email: support@citiprogram.org

Phone: 888-529-5929

Web: <https://www.citiprogram.org>

Introduction

- ❖ UTI is one of the most common bacterial disease encountered in the ambulatory care settings and emergency department (ED).
- ❖ Annually about 1 million cases of UTI present to the ED
- ❖ It is the second most common indication for antibiotic therapy (Mohr et al., 2016).

Background

- ❖ Studies show that there is an increase specimen contamination rate in Emergency department and acute care settings.(Klausing, Tillman, Wright,& Talbot,2016).
- ❖ Inappropriate collection of urine culture specimen often leads to repetition of lab tests or inappropriate antibiotic treatment(Caterino et al.,2017)
- ❖ Specimen contamination - false positive result – unnecessary antibiotic treatment – increased antibiotic resistance.

Needs Assessment

The proposed setting has a high percentage of urine culture specimen contamination rate.

Aims/Objective

QI project aims to reduce the urine culture specimen contamination rate in the ED by providing patient instruction using visual aid and thereby help the institution to achieve the goal of performance improvement and provision of quality healthcare.



Methodology

Pilot study using convenience sampling method for a period of 2 months. PI conducts the study in the ED for two days a week for eight weeks. At the end of study, data on culture results of the patients who received video instruction were retrieved with the help of Microbiology lab .

- ❖ PI instructs the patients, who meet the inclusion criteria, using an animated video on midstream urine collection process in an urban teaching hospital ED.
- ❖ Data on the culture study results of patients who got video instruction is retrieved and analyzed
- ❖ Specimen contamination rate of pre-study period and study period is compared.

Data Analysis

A comparative analysis done between the rate of specimen contamination two months prior to QI project and two months during the project. The result shows a minimal reduction in the specimen contamination rate during the QI project implementation period.

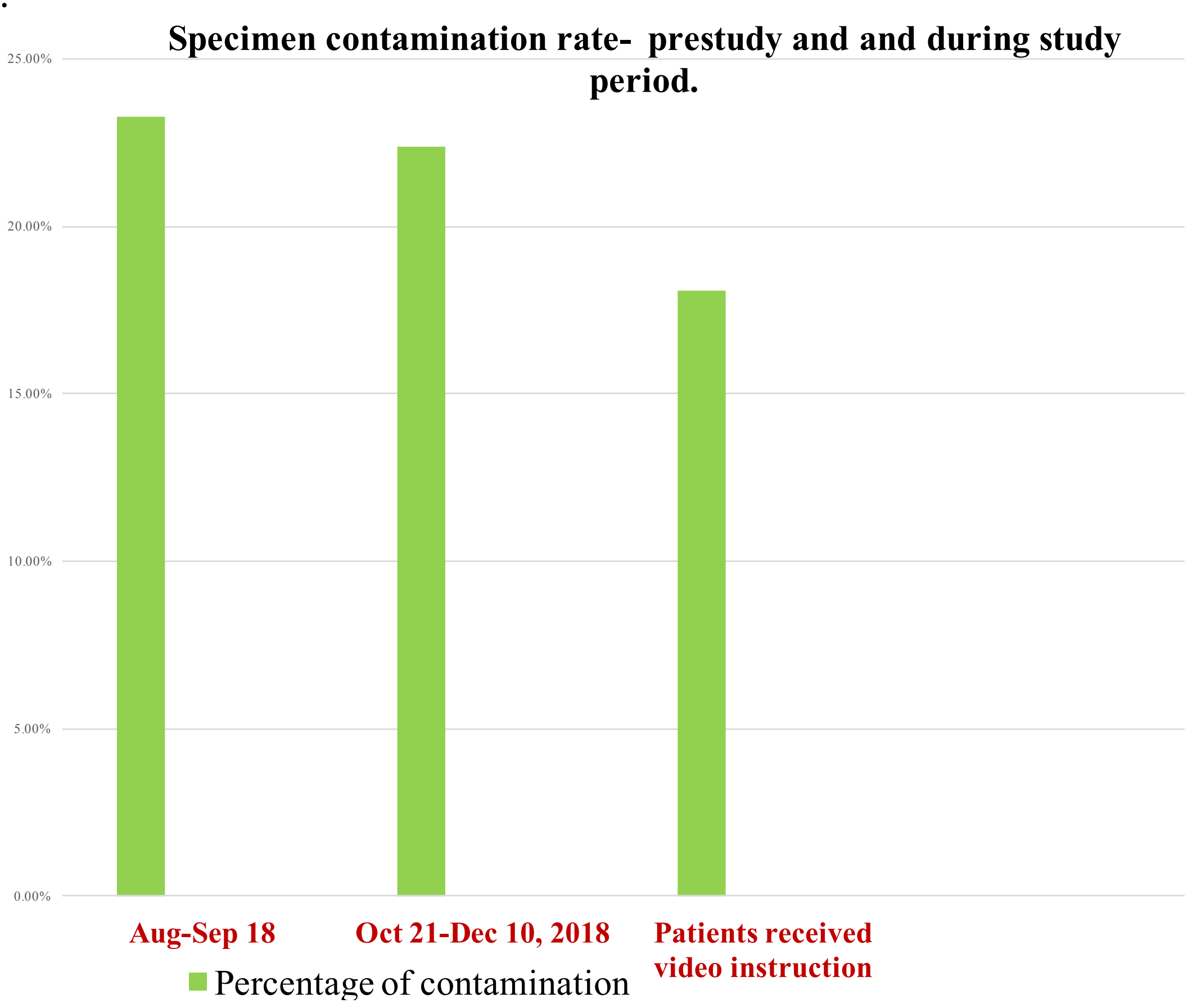
Implication

The QI project may have a positive effect on

- ❖ Improve the quality by reducing specimen contamination rate and reducing diagnostic errors.
- ❖ Reducing antibiotic resistance
- ❖ Effective patient education and patient engagement in their own health care
- ❖ Increase Patient satisfaction
- ❖Reduce call back time

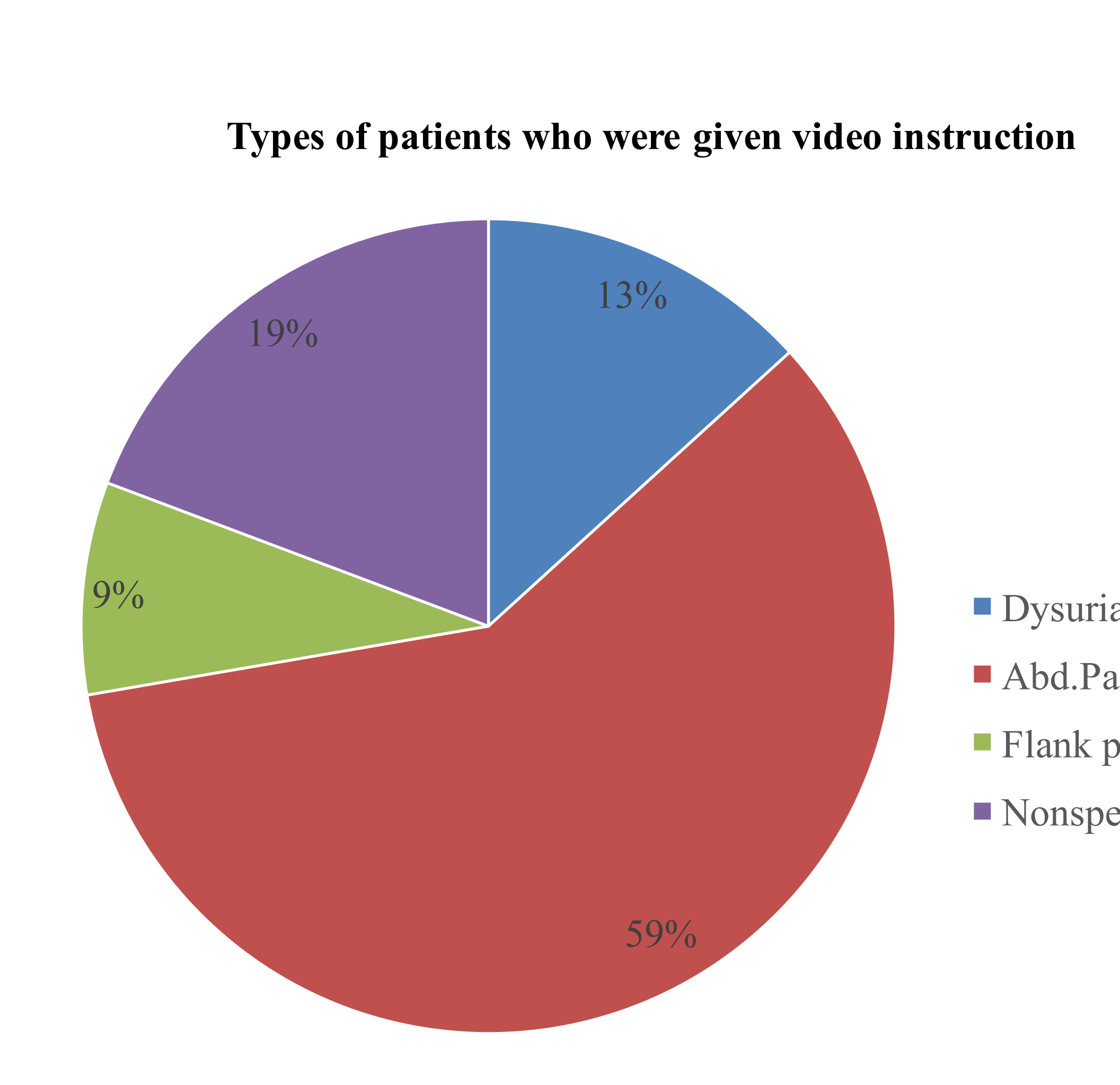
A picture worth thousand words and so does a video!. Video guided patient instructions can be incorporated in many areas of patient education especially in health care outside the hospital to reduce ED visits and hospital admissions.

Results



Video instruction given to 83 female patients and 15 specimens were contaminated (18.07%). N= 83

	Contaminated	Clean	Total
Video Instruction	15 (18.1%)	68	83
No Video Instruction	90 (23.31%)	296	386



Discussion / conclusion

This pilot study/ QI project result shows the significance of effective patient education and patient engagement in their own health care to improve the quality and to reduce the diagnostic errors as well. Video guided patient instructions can be incorporated in many areas of healthcare for effective patient education.

Dissemination

- ❖ DNP final project presentation.
- ❖ ENA journal/Conference publishing
- ❖ UH, Newark Presentation of final product
- ❖ Incorporation of video for ED Patient Education

Acknowledgement

The author acknowledges Rutgers school of nursing and University Hospital,Newark,NJ for the support to pursue and conduct the study. Acknowledging Dr. Mary, Kamienski and Dr. Sadler, Maryann for their continued support and encouragement

Reference:

Cateriono, J. M., Leininger, R., Klline, D. M., Southerland, L.T., Khaliqdina, S., Baugh,,C.W., Stevenson,K. B (2017). Accuracy of Current Diagnostic Criteria for Acute Bacterial Infection in Older Adults in the Emergency Department. *Journal of the American Geriatrics Society*, 65(8), 1802-1809. doi:1111/jgs.14912

Howerton, D., Anderson, N., Bosse, D., Granade, S., 7 Westbrook, G. (2005). Good laboratory practices for waived testing sites: survey findings from testing sites holding a certificate of waiver under the Clinical Laboratory Improvement Amendments of 1988 and recommendations for promoting quality testing. *NMWR: Morbidity & Mortality Weekly Report*, 54(44), 1-25.

Klausing,B. T., Tillman,S. D., Wright,P.W., & Talbot, T.R. (2016). The influence of contaminated urine cultures in inpatient and emergency department settings. *American Journal of infection control*, 44(10), 1167. doi: 10.1016/j.ajic.2016.03.055

Mohr, N. M., Harland, K. K., Crabb, V., Mutnick, R., Baumbartner,D., Spinosi, S., Faine, B. (2016). Urinary Squamous Epithelial Cells Do Not Accurately Predict Urine Culture Contamination, but may Predict Urinalysis Performance in Predicting Bacteriuria. *Academy of Emergency Medicine*, 23(3), 323-330. doi: 1111/acem.12894

Moralejo, D. (2008). Cleaning of the perineal/genital area before urine collection from toilet-trained children prevented sample contamination.*Evidence Based Nursing*, 11(1), 25. doi: 10.1136/ebn.11.1.25

Contact Information

kamienma@sn.rutgers.edu

Jpm387sn.rutgers.edu



**Reducing urine culture specimen
contamination rate by patient education using
a
visual aid-A quality improvement project.**

Project Chair: Dr. Kamienski, Mary
Project Team member: Dr. Maryann Sadler
Date : 03/07/2019

Jooly Koshy RN, BSN
Rutgers school of
Nursing

Introduction- Basic Overview



- ❖ Laboratory testing plays a significant role in the provision of quality care.
- ❖ Lab test contributes to diagnosis and prognosis of disease, treatment monitoring, and disease screening. Almost 70% of medical decisions are based on laboratory tests.

Background & Significance

- ❖ According to research studies, there is an increase in urine culture specimen contamination rate, especially in emergency room and acute care settings (Klausing, Tillman, Wright, & Talbot, 2016).
- ❖ The standard method of collection of urine culture specimen is midstream urine collection.
- ❖ Inappropriate collection of urine culture specimen often leads to repetition of lab tests or inappropriate antibiotic treatment (Caterino et al., 2017)

Background & Significance

- ❖ Repetition of tests in the ED due to specimen contamination
 - a delay in treatment
 - increased waiting room time
 - extra cost to the institution
 - reduced patient satisfaction
 - inappropriate antibiotic therapy
 - Increased call back time.



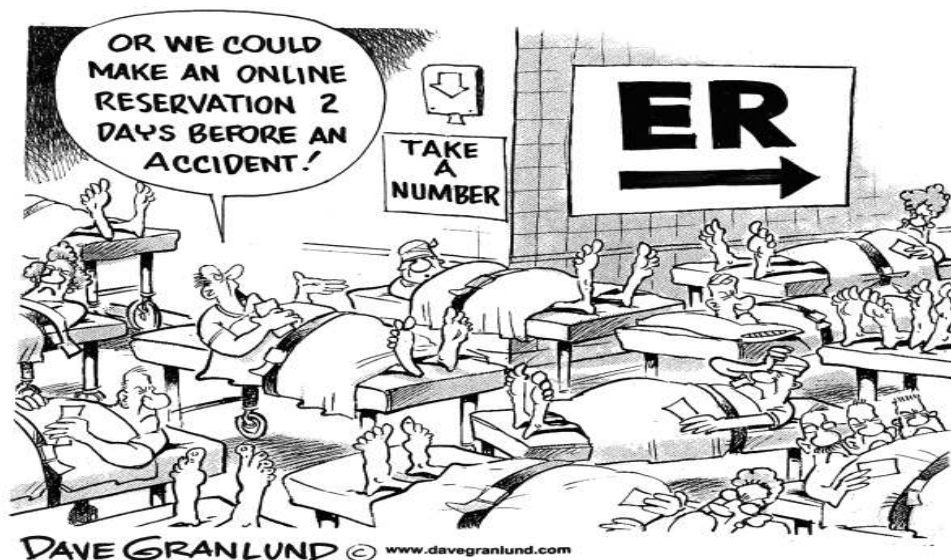
Background and Significance

- According to the 1999 report by Institute of Medicine (IOM), the number of people who die each year due to avoidable patient safety errors in the United States is estimated to be 98,000. Different measures have been taken into consideration to increase patient safety and improve quality of health care



Background and Significance

Patient overcrowding and short staffing in the ED is often a challenge to maintain quality measures and approaches.

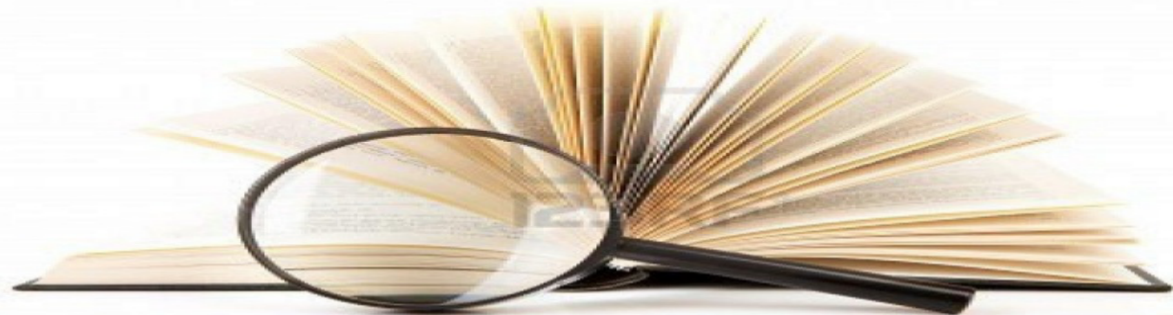


Focused Need/Problem

- ❖ Improper methods of urine culture specimen collection is an area of concern.
- ❖ False positive results of urine culture may culminate in unnecessary antibiotic  antibiotic resistance.
- ❖ Patient education on proper method of urine culture specimen collection using a visual aid (Video) may help to reduce the specimen contamination rate and thereby improve the quality of healthcare.

Review of Literature

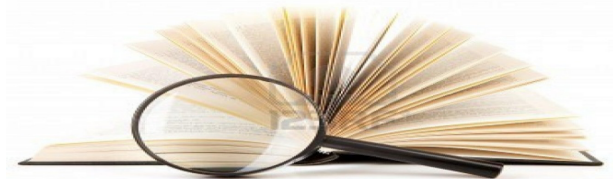
Improper urine culture specimen collection and misinterpretation of positive results often leads to adverse healthcare events, increased financial burdens, and over-treating of patients with antibiotics which increases the risk of antibiotic resistance (Garcia & Spitzer, 2017).



Literature Review

Review of Literature

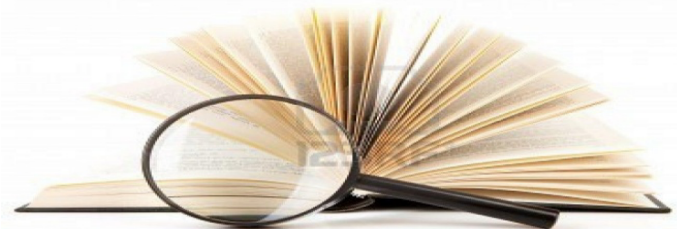
A quasi-experimental study which was done in an urban academic emergency room "Use of a Midstream Clean-Catch Mobile Application Did Not Lower Urine Contamination Rate" **shows no correlation or association with middle stream urine collection instrumental app and urine culture or analysis contamination rate among emergency room patients.** Personalized instruction using a visual aid may help the patients to understand more about the proper method of collection of urine culture specimen (Jacob et al., 2018).



Literature Review

Review of Literature

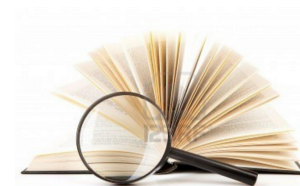
The retrospective evaluation of 131 patients with contaminated urine cultures during 12 month shows **that 48.8% (64 patients) experienced complications related to contaminated specimens.** The study used 17,006 urine culture specimen, and most of the contaminated specimens were from the Emergency Room (Klausing et al., 2016).



Literature Review

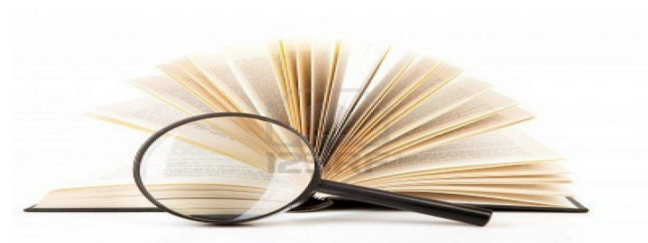
Review of Literature

- Randomized trial which was done in an ED of a tertiary care pediatric center in Montreal, Quebec, to evaluate the effectiveness of perineal cleaning before collection of urine culture specimen in preventing sample contamination using two groups has resulted that **the group using liquid soap and gauze pads to clean before specimen collection has reduced contamination rates than the group who did not use the cleaning** (Moralejo, 2008). Further studies is needed to clarify whether it is the cleansing or some other aspect of specimen collection in children that is most important in reducing specimen contamination.



Review of Literature

A randomized control study on the efficacy of visual aid in direct to consumer (DTC) prescription drug advertisements shows **that visual aid helps people recall quantitative efficacy information. The study shows that advertisement with bar chart or table elicited more accurate drug efficacy than those with no visual aid.** The study concluded suggesting the addition of visual aids to DTC advertisement (Sullivan et al., 2016)



Literature Review

Review of Literature

- A review of literature, MEDLINE search on effects of pictorial aids in medication instructions on medication adherence and compliance **shows that the use of pictorial aids enhances patient's understanding of the significance of medication compliance and adherence** (Katz, Kripalani, & Weiss, 2006)
- A sub study from a randomized control trial on the efficacy of two different pressurized metered dose inhaler spacer devices **shows that repeated video instruction helped to improve inhaler technique in young children** (Shaw et al., 2016).



Literature Review

Review of Literature

A pilot study, at the McMaster University School of Nursing in southwestern Ontario, on the effectiveness of videotape training and hands-on instruction in preparing senior nursing students to respond to emergency clinical situations **demonstrated significant improvement in performance by the groups who had video or hands-on instruction** (Baxter, Akhtar-Danesh, Landeen, & Norman, 2012).



Literature Review

Need Assessment

Urinary tract infection (UTI) is one of the most common bacterial diseases in the U. S. ambulatory care settings.

It is the second most common indication for antibiotic therapy (Mohr et al., 2016).

Laboratory reports from the proposed setting displays an increased rate (20.3% in a week report) of contamination of urine culture specimens (mixed flora of organisms) and the patients are often called back to repeat the tests.



Need Assessment

Lab report from study setting



Mixed Flora colony count between 10,000 CFU/Ml and 100,000 CFU/Ml. The presence of mixed flora generally results from specimen contamination. Due to quantity of organisms repeat specimen recommended.

Problem Statement

There is a high percentage of cultural diversity in the patient populations in this facility. Additionally, many of the patients do not speak or understand English. Using visual aids to educate these patients on the proper method of urine specimen collection may allow these patients to understand the process and reduce the numbers of contaminated specimens



Clinical Question

- Does **education** of (P) adult emergency department patients who need urine culture through (I) **use of visual aid** (video demonstrating the steps of specimen collection process) on proper method of collection of clean catch midstream urine culture specimen (O) **reduce urine culture specimen contamination rate**, (C) as compared to specimen contamination rate prior to the intervention?



PICO

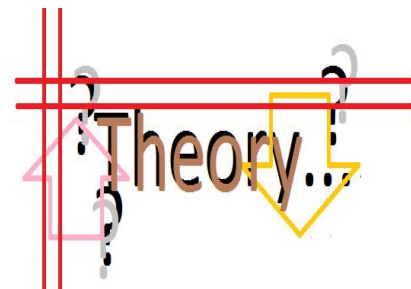
- **P:** Adult female patients more than 18 years' old who need urine cultures.
- **I:** Education to patients using visual aid on the proper method of urine culture specimen collection.
- **C:** Number of contaminated urine culture specimen pre and post intervention
- **O:** Reduction in number of contaminated urine culture specimen

Theoretical Frame work

Plan-Do-Study-Action mode (PDSA)

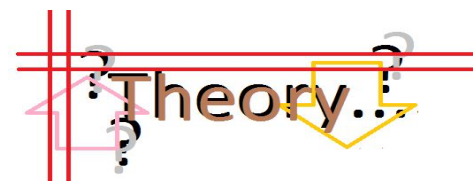
The first step (PLAN) has three components

- A) Assessing current situation and analyze cause.
- B)** Defining expected change and method of analyzing the expected outcome
- C)** Defining the time frame

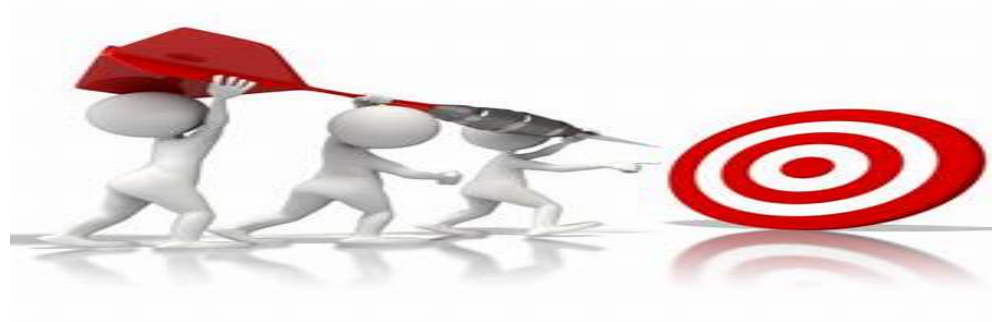


Theoretical Framework

- In **the second step (DO)**, the plans are being carried out.
 - Patient instruction/education on proper method of collection of clean catch midstream urine specimen using a video
- In **third step (STUDY)**,
 - the anticipated results are being evaluated.
 - Data on contamination rate of two months prior and two months during the intervention (Patient education) is collected from the microbiology lab and compare.
- In **the final step (ACT)**,
 - Anticipated result can be adopted or rejected based on the evaluation in the third step.
 - Integration of intended outcomes into other areas if it is adopted (*Improving Health and Healthcare Worldwide*, 2016)



Aims & Objectives



The aim of this QI project is to **reduce the urine culture specimen contamination rate in the ED by providing patient instruction using visual aid** and thereby help the institution to achieve the goal of performance improvement and provision of quality healthcare.

Aims & Objectives

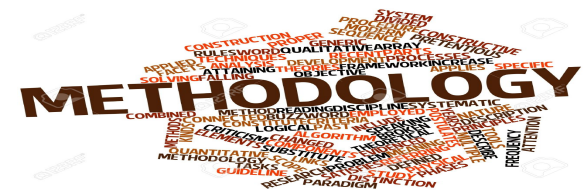
The objective of this quality improvement project is

- ❖ to collect baseline contamination rate data prior to introduction of visual aid education
- ❖ to collect data on specimen contamination rates after the intervention of patient education using visual aid (video)
- ❖ to compare the pre and post intervention data

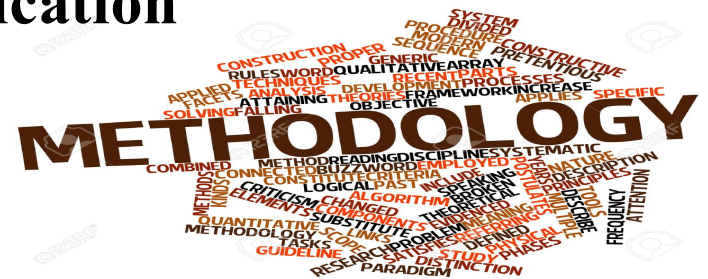


Methodology

- Pilot study/QI project using convenience sampling method for a period of 2 months.
- PI conducts the study in the ED for two days a week for eight weeks (10/21/18 – 12/10/18)
- Data on culture results of the patients who received video instruction, pre study and during study were collected with the help of Microbiology lab.



- **The steps of proper collection method of midstream urine specimen for urine culture was explained to the patients who met the inclusion criteria, before specimen collection using a visual aid (Video).**
- **Video has Spanish voice over to accommodate Spanish speaking patients.**
- **Patients with a language barrier will be given assistance via translator service for communication**

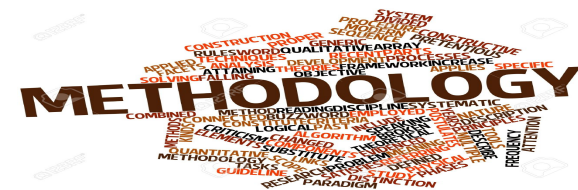


Video Instruction



Video is evaluated and validated by the hospital Nursing research council and project chair Dr. Kamienski, Mary.

Spanish voice over is validated and approved by registered language interpreter at the study setting.



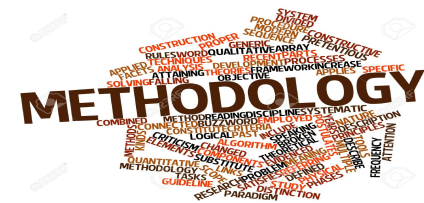
Methodology

Study Setting

Emergency department of an urban, level one trauma, hospital.

According to the U.S. Census Bureau (2017),

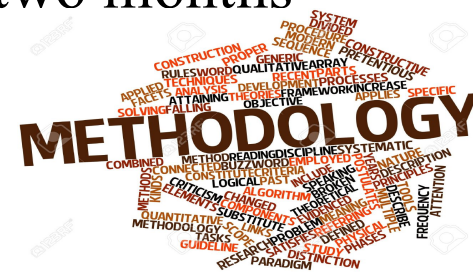
- ❖ Newark city has a population of 281,764.
- ❖ 50.5% of the population is female.
- ❖ 26.9% of females under the age of 65 years.



Methodology

Study Interventions

- Patients who met the inclusion criteria were given a 1-2 minutes educational session by primary investigator (PI) using visual aid(video) prior to specimen collection for urine culture study.
- PI then collected the specimen from patients to be transported to the lab.
- Intervention was carried out 2 days a week for two months (10/21/2018 – 12/10/2018)





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Newark, NJ 07101-1709



Contact: Mrs. Jooly Koshy RN, BSN
Cell #: 732 644 4858
mathewjp@uhnj.org



Date	Time	MRN #	Comments

Date	Time	MRN #	Urine Culture Result	Comments

Risk/Benefits/cost/Recruitment

-

Evaluation Plan

Data Analysis Plan

Two types of data obtained in this QI project

Urine culture contamination rate for two months prior to QI project

(08/01/2018 – 09/30/2018),

Percentage of contamination during the implementation period.

(10/21/2018 – 12/10/2018).

The PI recorded medical record number(MRN) of patients on whom the video instruction was given.



Evaluation Plan

Data Maintenance and Security

- ❖ The MRN is used to retrieve the urine culture results.
- ❖ A unique code was assigned to each patient who got video instruction on midstream urine collection method.
- ❖ All information is stored in a password protected document.



Findings



The rate of specimen contamination during the study period and pre study was analyzed.

Pre study period (08/01/18- 09/30/18) contamination rate: 23.27%

Rate during study period (10/21/18-12/10/18): 22.38%

Rate of contamination of the group who got video instruction: 18.07%

Findings : *Contamination rate during pilot study period*

	Contaminated	Clean	Total
Video Instruction	15 (18.1%)	68	83
No video instruction	90 (23.31%)	296	386



Findings: *Contamination rate case specific*



Complaints	contaminated	clean
Dysuria	1 (9%)	10 (90.9%)
Flank pain	0	7(100%)
Nonspecific complaints	6 (37.5%)	10 (62.5%)
Abdominal pain	16 (32.65%)	33 (67.34%)

Recommendation/Implications



This QI project could not demonstrate the impact of video instruction in reducing the rate of urine culture specimen contamination in the ED due to lack of statistically significant result due to the heterogeneous data obtained.

However, the reduced rate of contamination during the study period can be considered as a possibility for positive study implications.

Recommendation/Implications



Positive implications of this QI project

- ❖ Reducing specimen contamination rate & reducing diagnostic errors.
- ❖ Reducing antibiotic resistance by proper diagnosis
- ❖ Effective patient education and patient engagement in their own health care
- ❖ Increase Patient satisfaction

Recommendation/Implications



The implications of decreasing the rate of contamination

include:

- ❖ **Efficient access to clinically meaningful results,**
- ❖ **Reduced patient inconvenience from provision of a repeat specimen,**
- ❖ **Reduced costs to the organization due to reduced need for retesting.**

Recommendation/limitation

PI recommends



- ❖ The use of homogenous data to analyze future studies for statistical significance
- ❖ Use of heterogeneous data was a limitation of this study
- ❖ Use of inclusion criteria in retrospective data would give more similar data to compare

Recommendation/Implications



A picture worth thousand words and so does a video!. Patient instructions using Video can be incorporated in many areas of patient education for effective patient education and patient engagement in their own health care

Encourage your patients to get involved.



-  The Speak Up program, established by the Joint Commission, is an initiative that encourages patients to play a more active role in their health care.
-  You can find brochures, videos, posters, and other materials for free at jointcommission.org.
-  Materials can be reprinted and are available in English and Spanish.

Sustainability of this QI project

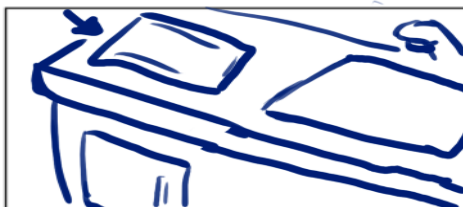
- **Presentation at the Nursing Research Council meeting at the study setting.**
- **Incorporation of patient education material in the ED**
- **Incorporation of instructional video in the EPIC hospital wide after Nursing Research council approval**
- **Education to medical technician in the ED for proper patient education**



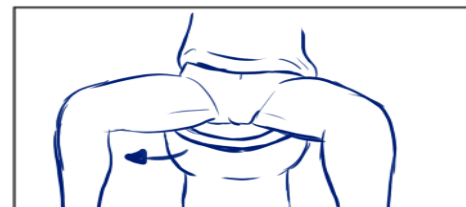
Animated video storyboard



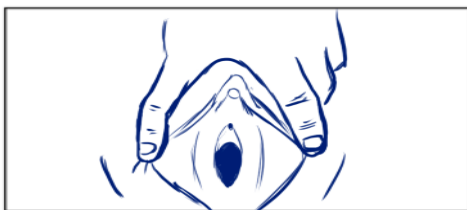
1. Wash your hands with soap and water. Rinse, and then dry.



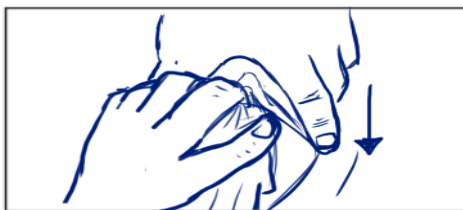
2. Open all towelettes and place them on a clean surface within reach.



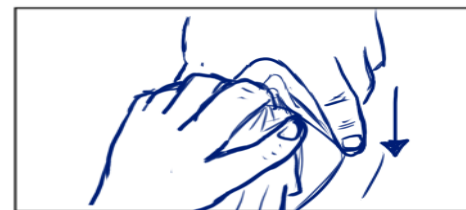
3. Sit comfortably on the seat and swing one leg to the side as far as possible.



4. With one hand, spread the labia folds and keep them spread throughout the cleansing and specimen collection.



5. Wash the urinary opening area using 3 soap towelettes; use one at a time wiping only front to back between the folds of skin.



6. Rinse with one sterile saline towelette using front to back motion.



7. Void a small amount of urine into the toilet.



8. Collect a portion of the urine in the specimen container. Keep fingers away from the rim and inner surface of the container.



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Identifier: FWA00003913

IRB Chair Person: Cheryl Kennedy

IRB Director: Carlotta Rodriguez

Effective Date: 3/7/2019

eIRB Notice of Closure for Study # CR00009646

STUDY PROFILE

Study ID: [Pro2018001414](#)

Title: Reducing urine culture specimen contamination rate by patient education using a visual aid-A quality improvement project

Principal Investigator: JOOLY KOSHY

Co-Investigator(s): Mary Kamienski

CURRENT SUBMISSION STATUS

Submission Type: Continuation([CR00009646](#))

Report type: Final Report **Study Status:** Study is completed (all enrollment, treatment, data collection, follow-up, and data analysis are complete.)

Closure Date: 3/7/2019 **Review Type:** Exempt

ALL APPROVED INVESTIGATOR(S) MUST COMPLY WITH THE FOLLOWING:

1. **Unanticipated Problems:** Unanticipated problems involving risk to subjects or others must be reported to the IRB Office (45 CFR 46, 21 CFR 312, 812) as required, in the appropriate time as specified in the attachment online at: <https://orra.rutgers.edu/hssp>
2. **STUDY RECORDS:** Protocols and all amendments must be kept in a secure place by the principal investigator for a period of at least six (6) years after completion of the study.
3. **CONSENT FORM:** The original signed copies of consent documents must be kept in a secure place by the principal investigator for a period of at least six (6) years after completion of the study.
4. **Removal of Original Research Data:** All original research data and materials belongs to the University but should ordinarily be maintained by the research unit of origin at the University, or by the School department. Original research data and materials can be removed from the University only when the chair and dean determines that it is impractical for the investigator to make copies of the materials. For additional information, please see the University policy on Removal of Original Research Data and Materials from the University at: <http://vpr.rutgers.edu/>
5. The Investigator(s) did not participate in the review, discussion, or vote of this protocol.
6. **Closure:** Study is completed (all enrollment, treatment, data collection, follow-up, and data analysis are complete.) The study is being closed at the request of the principal investigator.
7. Reminder: <https://orra.rutgers.edu/revisedcommonrule>

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Study.PI Name:
Study.Co-Investigators:
