



Should You Skip the Dip? A VCUg Performance Improvement Project



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A B S T R A C T

Keywords:

Fluoroscopy
VCUG
Pyelonephritis
UTI
Urinalysis
POCT

A child undergoing a fluoroscopic voiding cystourethrogram (VCUG) can be at an increased risk for a kidney infection (pyelonephritis) or disseminated infection (urosepsis). Nurses responsible for the required catheterization are obligated to provide care according to best practice. Radiology nurses practicing in the fluoroscopy department at the Division of Diagnostic Imaging & Radiology of the Children's National Health System, located in Washington, DC, designed and implemented a performance improvement project. The goal of this project was to determine if it is best practice to perform a point-of-care dipstick urinalysis for all specimens before a VCUG or only for those that were suspicious for a urinary tract infection (UTI) based on the assessment of the patient's urine and clinical history. During a 5-month study period between May 1, 2015 and September 30, 2015, nurses collected data on patients undergoing a VCUG. Urine specimens collected before VCUG were assessed for color, clarity, and odor. The time since last fever was also determined. Point-of-care testing (POCT) for urine dipsticks was used in suspected cases of active UTI based on the urine and fever assessments. A partnership with our urology clinic was created to help secure a pathway to POCT for urine dipsticks. The data were displayed on a performance board within the department to keep the nursing team apprised of monthly findings. Of 266 VCUG examinations performed in a 5-month study period, three urine specimens were tested, and of those, two were positive for UTI. Of the two positive dipsticks, one examination was cancelled and the other was completed at the request of urology. Based on our findings, the fluoroscopy team determined that because of a low occurrence of positive urine dipsticks, performing a dipstick only on suspicious specimens as opposed to every specimen is best nursing practice.

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Introduction

A voiding cystourethrogram (VCUG) is a fluoroscopic examination of the genitourinary tract frequently performed in the practice of pediatric radiology. Common indications for a VCUG in the pediatric patient include recurrent urinary tract infections (UTIs) and hydro-nephrosis (Chishti, Maul, Nazario, Bennett, & Kiessling, 2010; Nerli, Amarkhed, & Ravish, 2009). During the examination, the patient's bladder is catheterized to administer contrast material. The patient is then observed fluoroscopically while voiding to assess for the presence of genitourinary pathology, such as vesicoureteral reflux, bladder wall irregularities, and urethral abnormalities.

During the course of a year in the Division of Diagnostic Imaging and Radiology of the Children's National Health System, nearly 600 VCUG examinations are performed in the fluoroscopy suite

(Figure 1). Although VCUG offers significant diagnostic benefits, it is not without risk. In addition to the general health risks associated with ionizing radiation exposure and iodinated contrast administration, catheterization also poses the specific risk of introducing infection (Kim, Lee, Kim, Chang, & Lee, 2007). For this reason, catheterization is performed under sterile conditions by a specially trained radiology nurse. In addition, a VCUG should not be performed at the time of an active UTI because of the increased risk of pyelonephritis and urosepsis (Rachmiel et al., 2005).

Radiology nurses in the fluoroscopy department implemented a performance improvement project to determine the best practice for screening patients before VCUG. The goal of the screening was to identify patients with active UTI in whom the VCUG should be deferred.

Materials and methods

In 2015, nursing units at Children's National Health System began to use performance boards to share information. Management boards as described by Wheeler (2014) can be a simple tool

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Figure 1. Children's National Health System fluoroscopy suite.

intended to give information at a glance. The boards were promptly used to display performance improvement projects, data on quality outcomes, patient acuity, unit daily census, unit-specific information, and so on.

In April 2015, the radiology nursing team in the fluoroscopy department was presented with a problem and identified it as a project for their performance board. The project was quickly launched after an unexpected notification from a staff urologist to the performing radiologist regarding a post-VCUG complication. The fact that a patient developed pyelonephritis and urosepsis after a VCUG examination became a discussion on best practices in the care of patients scheduled for VCUG examinations. Several questions arose among the nurse and physician team on the assessment of a patient's urine before the performance of the VCUG. Was the assessment consistent among the nurses? What did the assessment entail? What criteria of the assessment warranted a cancellation of the examination? After the nurse assessment discussions, the overarching question became: *Should a urine dipstick be performed with every urine specimen before performing a VCUG or only for those specimens with criteria of suspicion for infection?*

Before implementation of the project, the practice was to simply cancel the VCUG examination if the nursing assessment was highly suspicious of an active UTI based on a cloudy appearance of the urine sample and/or history of recent fever within 48 hr of the

examination (Figure 2). Otherwise, the team continued with the examination and sent a urine specimen to the laboratory for culture. All collected urine samples are routinely sent to the laboratory for culture as a standard of practice. Dipstick testing was not routinely used to screen urine samples for evidence of an active UTI before deciding whether to proceed with a VCUG examination.

The nurses began the performance improvement project by answering the following question: How best could the urine assessment become standardized among every nurse? Because a different nurse can be assigned to fluoroscopy daily, the nursing team collectively agreed on two assessment criteria for every urine sample obtained before the VCUG examination: (1) time duration since last fever and (2) urine color, clarity, and odor. Each nurse committed to following the new assessment practice, and it was quickly incorporated as part of standard practice.

During the planning phase of this project, the nurses acknowledged that the lack of point-of-care testing (POCT), a screening or diagnostic tool used near the time and place of patient care (Kost, 2002), would be a barrier to performing a dipstick. The team would have to think about establishing a process to follow when a dipstick is required. The project lead nurse reached out to our partners in urology to discuss a collaborative process to follow when a dipstick was required. The need for nurses to work effectively with other health care professionals is vital in today's rapidly changing and complex health care environments (McComb & Simpson, 2013). Having a shared mental model among the teams caring for our urology patients was necessary to complete successful and safe VCUG examinations. Because most of the VCUG patients referred to the fluoroscopy department are from the urology clinic, it seemed reasonable to seek a collaboration to secure a reliable and timely pathway to POCT. The urology team had the training and competency to perform urine dipstick POCT for the numerous patients they see every day. This partnership made sense because it allowed for easy communication between the two services at the point of care, thus decreasing any delays in care. Through the collective expertise of both teams, the partnership helped to support and enhance the quality care provided in fluoroscopy (Wilhelmsson, 2013).

To initiate collaboration between the services, the project lead nurse contacted the urology program coordinator to discuss the project and the desire to develop a process for our future VCUG

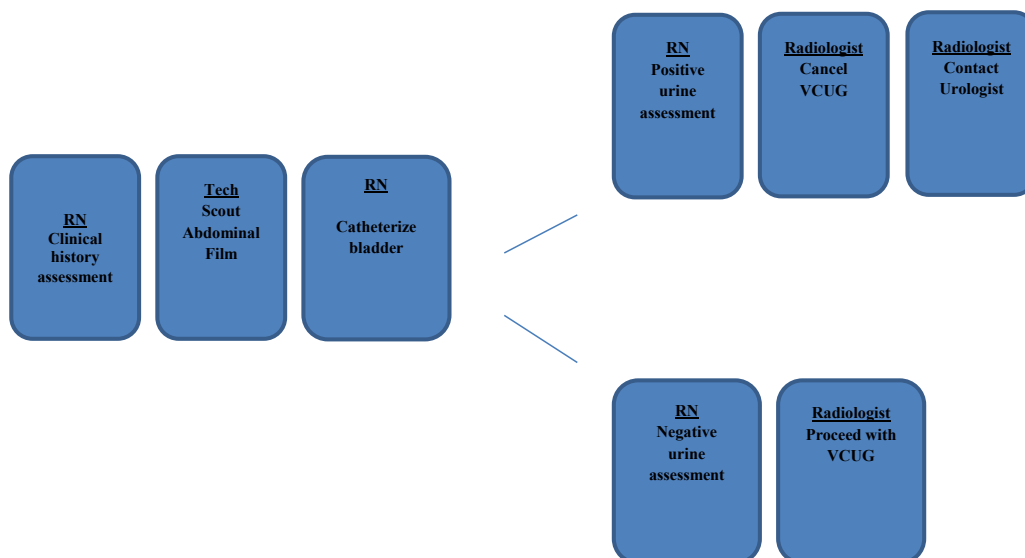


Figure 2. Prior VCUG examination workflow. RN = Registered Nurse; VCUG = Voiding cystourethrogram.

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