

BLOOD WITHDRAWAL FROM INTRAVENOUS CATHETERS BY ED NURSES: COMPARISON OF TWO PRACTICES



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Contribution to Emergency Nursing Practice

- By providing the nurses working in the emergency department evidence that a change in practice will help them in their flow of work and contribute to getting their work done faster. Furthermore contributing in decreasing length of stay and decrease emergency department overcrowding.
- By creating an easy way to make care provided to patients be more holistic, helping the emergency department nurses satisfy their patients more and be empowered as patient advocates.
- By provided a new practice where the emergency department nurse would provide care in all aspects to safety for patient and themselves in light of reduction of sharp injuries, blood and body fluid exposure by using the vacationer system.

Abstract

Problem: Laboratory tests are essential to diagnosis and treatment in the emergency department, but they can result in prolonged waiting times for patients, multiple needle pricks, and complaints about pain and discomfort. The goal of this project is to assess if a change in the blood collection process will lead to any improvement and benefit in care delivered with regard to time, patient comfort, and cost.

Methods: A feasibility study was conducted to evaluate the change in practice from cost, time, and applicability perspectives. Using an observational approach, data were collected about the management of a possible change in practice in the emergency department at American University of Beirut Medical Center. Trials of 2 proposed changes to practice were conducted and compared with the current practice. The nurses were trained in the proper use of blood withdrawal using a Vacutainer Luer adaptor.

Results: It was shown that intravenous line insertion and blood collection processes using the Vacutainer Luer adaptor were conducted in 46.2 seconds, which is less time spent than the current process but requires a small investment.

Implications for Practice: Allowing registered nurses to withdraw blood with the start of a peripheral intravenous line will significantly reduce length of stay and costs and enhance patient experience in the emergency department at American University of Beirut Medical Center.

Key words: Emergency nursing; Blood withdrawal; Practice improvement; Sharp; Redraws; Length of stay

The American University of Beirut Medical Center (AUBMC) in Lebanon receives a large number of patients from diverse cultures and socioeconomic levels with varying acuities. Like any other medical center, AUBMC has invested a significant amount of time on bed management, case management, tactics to decrease length of

stay (LOS), and other projects in an effort to improve operations, in alignment with patient satisfaction and delivery of high-quality care. The emergency department is well known for problems such as overcrowding and sometimes is a major source of dissatisfaction from the viewpoint of patients and staff. Based on observation and discussion among ED staff, it was noted that 2 common complaints voiced by the patients at the AUBMC emergency department are frequency of venipunctures required to collect blood samples and the time they have to wait.

Although venipuncture is a common procedure for reaching the venous bloodstream, it is an invasive procedure used in diagnosis and parenteral therapy.¹ The current intravenous (IV) insertion process and blood collection process at AUBMC follows traditional practice, in which the registered nurse (RN) inserts the IV line and

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technicians then withdraw a blood sample and send it to the laboratory for analysis.

The issue of concern is the blood collection process, which is causing a delay in making a diagnosis. Use of the Ishikawa analytic tool showed that some of the reasons for the delay are ED overcrowding, multiple venipunctures, patient acuity, waiting time for the phlebotomist to arrive, specimen processing time, and staff shortage.

In a recent study by the evidence-based health care management unit at AUBMC, data were collected on 128 cases concerning the process of blood withdrawal. Results showed that the average time it took the phlebotomist to arrive at the bedside of the patient after being called to collect a blood sample was 2 minutes and 27 seconds. Considering that this time is billable and that the average cost of bed usage per hour in the emergency department at AUBMC is \$9.33, the delay in time to diagnosis is considered a loss.

Some causes of frequent venipuncture are drawing a blood sample after a failed attempt, also known as a “redraw.”² Hemolyzed samples also account for a number of redraw events. Hemolysis can be defined as “The lysis or the breaking open of red blood cell (erythrocyte).”³ The only data available at AUBMC concerning hemolysis is hospital wide, which is 27.87% of total laboratory studies in the year 2012; hemolysis rates on a unit basis, including the emergency department, are not available. Considering that the practice was the same in 2013 and 2014, we can presume that the hemolysis rate has not changed since.

The goal of this project was to assess if having RNs withdraw blood with the start of a peripheral IV line will significantly reduce LOS and costs and enhance the patient experience in the emergency department. The objectives are to (1) identify if the proposed change of practice will decrease the duration of blood collection and time to reach diagnosis, measured through observation and comparison of the blood collection and IV insertion process duration; (2) evaluate patient satisfaction in light of discomfort measured through the number of venipunctures endured; and (3) assess if the change in practice would be less costly in the proposed practice.

Literature Review

TIME TO DIAGNOSIS

Emergency departments worldwide are experiencing increased LOS and overcrowding. Research and investigation concerning the increase in ED utilization have led the Institution of Medicine to label the situation as the “national epidemic of overcrowding EDs.”⁴

Median length of stay is around 130 minutes in some emergency departments. To reduce this time, ED admin-

istrators started using case managers and overcrowding control tactics recommended in the medical literature to solve patient flow. Additionally, tactics used by some hospitals have focused on improving test processing as an effective means to decrease LOS.⁴

New approaches to management of severe sepsis and septic shock appear to be time dependent; studies recommended the administration of antibiotics as soon as possible when reasonable suspicion of sepsis is evident to increase the chances of a favorable outcome.⁵ Understanding the link between LOS, time to reach a diagnosis, and test processing is essential because specimen withdrawal and results directly influence time to reach a diagnosis for the patients ultimately influencing the overall LOS of the patient.

PATIENT DISCOMFORT AND EXPERIENCE

Anticoagulation complicates venipuncture, and frequent venipuncture can cause nerve damage and neuropathic pain, local and systematic infections, vein damage, hematoma, and superficial bleeding.^{1,6} Some pain is inevitable through venipuncture, but pain and discomfort must be minimized because they are major factors leading to patient dissatisfaction. Fundamental nursing care, competence in clinical care, education, and communication help reduce and treat pain and discomfort.^{7,8}

PROCEDURE COST

In addition to the pain of frequent venipuncture, the unexpected failure to withdraw the sample by the phlebotomist leads to the commonly overlooked budgetary problem of redraws,⁹ which then add to unexpected cost in short-term financials and account for added expenses at the point of care.⁹ One emergency department at a 225-bed hospital had redraws up to 10,013 times a year; at an average cost of about \$300, this adds up to \$3 million annually.⁹

Analytic study of the blood drawing process in hospitals in the United States showed that redraws in the emergency department would delay the patient an additional 30 minutes (7 minutes for the redraw, 20 minutes to test the sample, and 3 minutes for routing the sample to and from the laboratory).² Considering that this time spent on an ED bed is billable and the average cost per minute in the United States emergency department is \$3.68, this additional waiting time is considered a loss.²

NURSES OVERLOOKING PHLEBOTOMISTS

Is it enough to train phlebotomists in a better technique, or should AUBMC follow the suggestion of some studies, which have shown that blood withdrawal using catheters results in reduced irritation, anxiety, and superficial bleeding risk?⁶

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