

# Decreasing Blood Culture Contamination Rates in the Emergency Department (ED)

Stacy L. Doyle, RN, MBA, CPN; Tracy Hartman, MHA, CPHQ; Georgia Stephens, RN, BSN, NE-BC; Lisa L. Schroeder, MD, FAAP, FACEP; Laura Fitzmaurice, MD, FAAP, FACEP

Emergency Nursing Services, The Children's Mercy Hospital, Kansas City, Missouri; Quality and Safety, The Children's Mercy Hospital, Kansas City, Missouri;  
Division of Emergency Medicine, The Children's Mercy Hospital, Kansas City, Missouri

## Background

Early in 2008 we identified that our ED and Urgent Care Centers (2) had a greater rate of contaminated blood cultures compared to a national benchmark. Our goal was to determine where contaminants were being introduced and identify a practice change that would lead to an overall rate decrease.



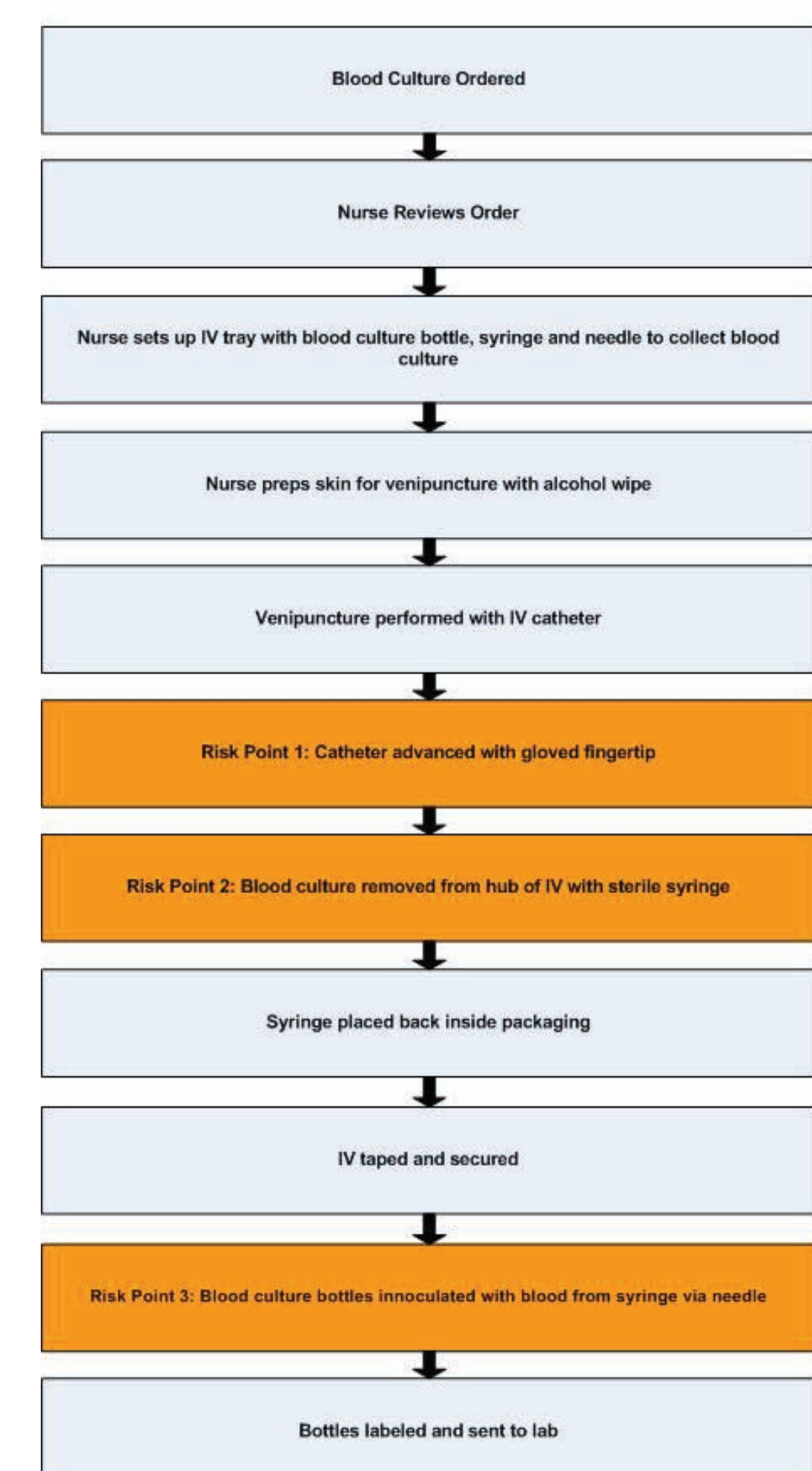
## Significance

Contamination in blood cultures can lead to return visits to the ED, increased cost to family and hospital, possible admission due to tainted results, and unnecessary administration of antibiotics and family anxiety. In addition, repeated labs for another blood culture costs \$103 and 40 minutes staff time at our institution.

## Strategy and Implementation

- Retrospective data regarding the total number of cultures and total number of contaminated cultures was gathered.
- Current nursing practice was explored through interview and direct observation.
- Existing practices were evaluated in a step-by-step process through flow diagrams to identify potential entry for common contaminants in the current collection process.
  - o Practice involved drawing blood cultures simultaneously with other lab work when placing an IV.
- Pre-intervention process was changed to eliminate potential entry points for contaminants by:
  - o ensuring proper cleaning of blood culture bottles
  - o ensuring proper disinfection of the collection site
  - o separating venipuncture from the IV placement using a closed collection system
- Goal set of less than 4% contamination rate based on benchmarking with other hospitals.
- ED RNs educated in the new process and procedure for blood culture collection.
- Physicians alerted of the change in practice in order to assist in the preparation of the families for the procedure.

### Pre-Intervention Process Flow

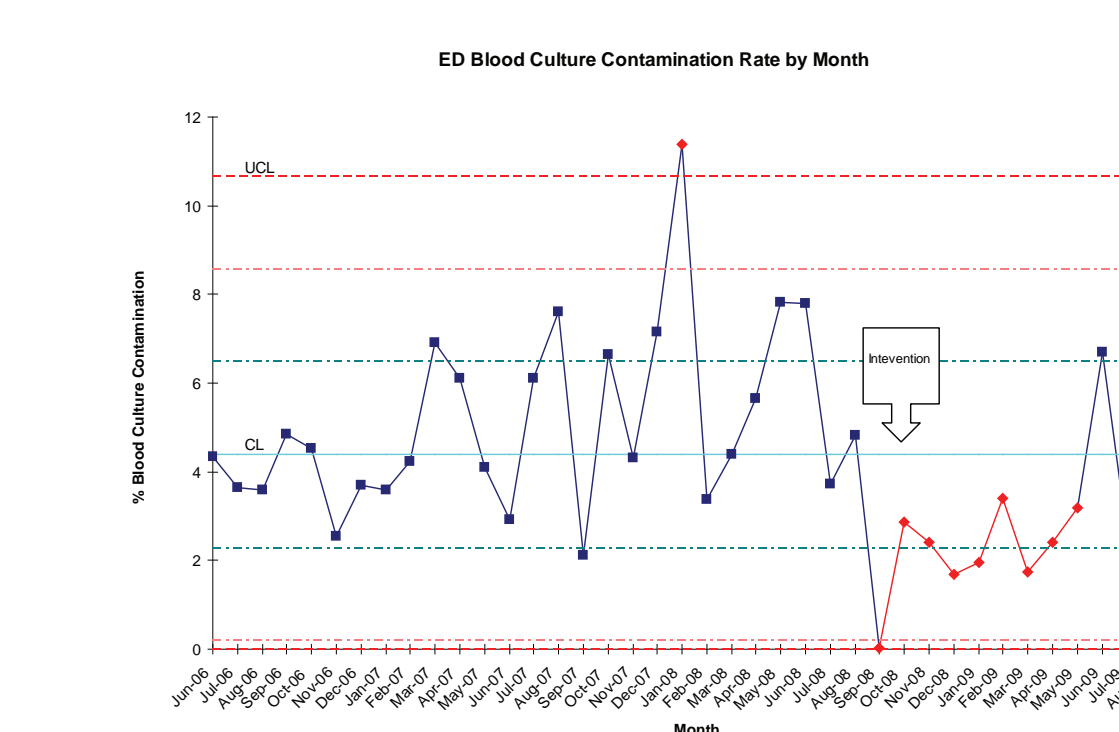
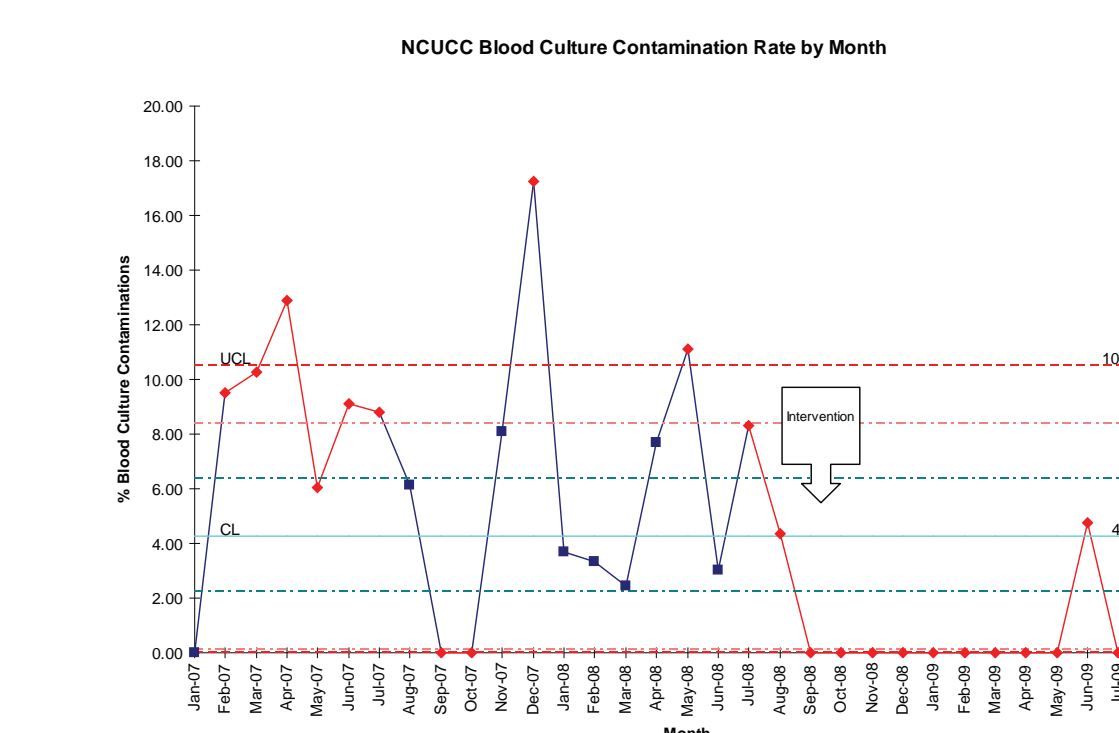
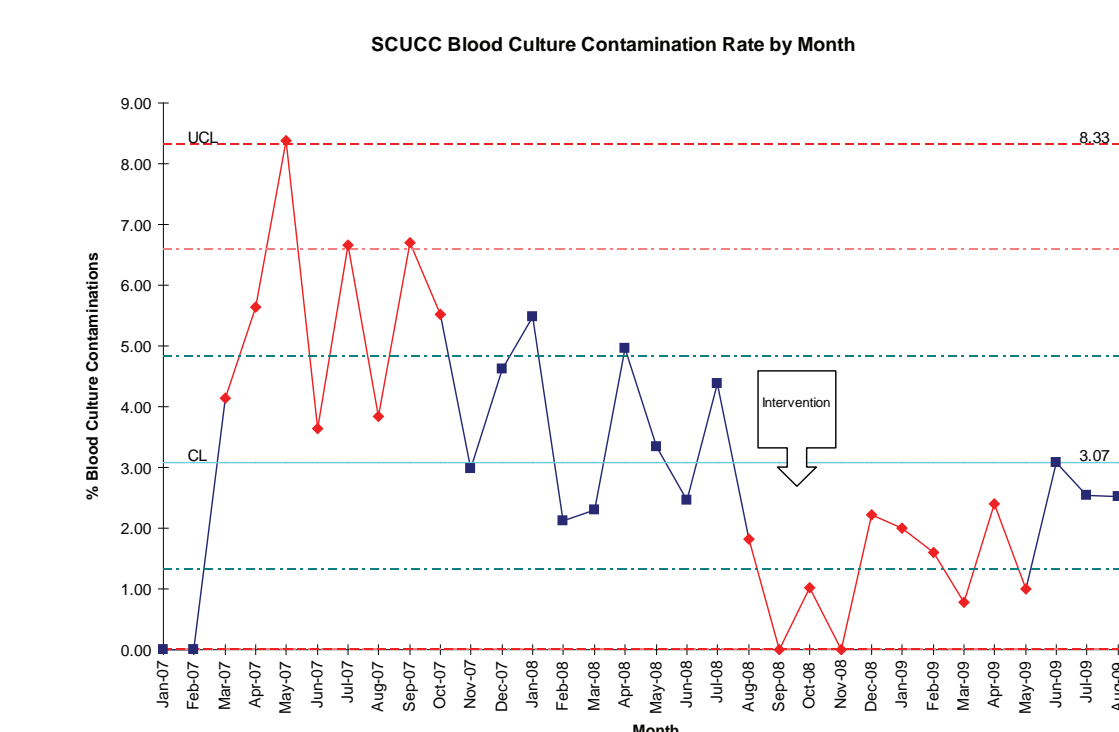


### Risk Point Responses

- Risk Point 1: Use separate needle sticks when obtaining a blood culture
- Risk Point 2: Use closed system; no longer collect blood from hub, instead draw directly from vein.
- Risk Point 3: Staff were taught to properly prepare blood culture bottles by wiping the top with alcohol when these were previously assumed to be sterile, but were not.

## Evaluation

The intervention is analyzed monthly by collecting data (total cultures, positives and contamination rate) from lab (pre-intervention high: 11.38%, post-intervention high: 6.7%). Spikes above 4% are investigated by the ED leadership to evaluate educational opportunities and practice variation.



## Implications

Using rapid cycle improvement, nursing practice changes in how samples are obtained can lead to lower contamination improving patient satisfaction and quality. An added benefit was the intervention led to lower blood culture volume as physicians reviewed other results before ordering cultures.