



Clinical Safety & Effectiveness Session # 11

Blood Culture Contamination



CENTER FOR PATIENT SAFETY & HEALTH POLICY

UT HEALTH SCIENCE CENTER™

SAN ANTONIO

8/28/2009

THE UNIVERSITY OF TEXAS
MD ANDERSON
CANCER CENTER

Educating for Quality Improvement & Patient Safety *Making Cancer History®*

The Team

- Nancy Ray CS&E Participant
- Greg Bowling CS&E Participant
- Joyce Ornelas, Roselle Cabagay, Wen Pao, Rosette Atienza, Leticia Wilson, Katherine Cox, Esther Hazelwood, Carol Monk, Jennifer Mapa, Deanne Richter, Lorisa Gray, Liza Paulma, Shiji Paulson, Cecile Ferrer, and Renimol Kochumon, Dr. Jorgensen, Rosemary Paxson, Charles Reed, 8th floor nursing staff
- Facilitator Dr. Amruta Parekh

What We Are Trying to Accomplish?

OUR AIM STATEMENT

The aim of our project is to reduce the blood culture contamination rate to less than 2% by August, 2009, on the 8th floor of the University Hospital.

Project Milestones

- ▶ Team Created Mar 2009
- ▶ AIM statement created Apr 2009
- ▶ Weekly Team Meetings Started Apr 2009
- ▶ Background Data, Brainstorm Workflow and Fishbone Analyses Jan to Apr 2009
- ▶ Interventions Implemented May 2009
- ▶ Data Analysis Jun '08 to Aug '09
- ▶ CS&E Presentation August 28, 2009

Background



- ▶ Blood Culture contaminants lead to:
 - Increased length of stay
 - Increased costs of patient care
 - Unnecessary use of antibiotics (with resultant adverse effects)
- ▶ Recommended Benchmark for contamination rates is in the range of 2–3%.

Background

- ▶ In five different patient care areas of our hospital, the average rate of contaminated blood cultures was 6.2% during the time period from 11 / 2007 to 11 / 2008.

How Will We Know That a Change is an Improvement?

- ▶ Types of measures: Number of contaminated blood cultures expressed as a rate.
- ▶ How we will measure: Data reported from the lab in 2 week intervals.
- ▶ Specific targets for change: Contamination rate less than 2%.

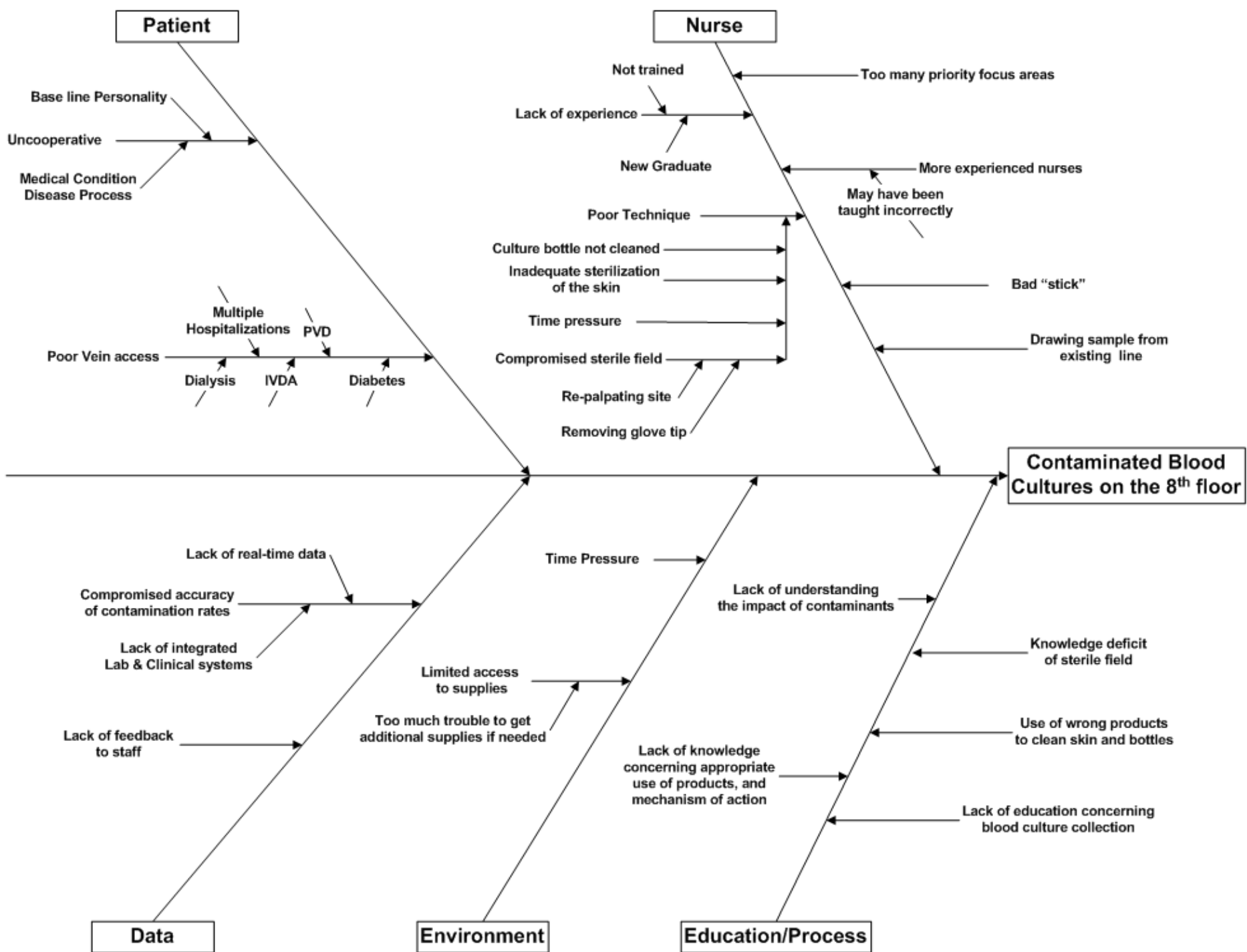
Background Data

Mean blood culture contamination rate on 8th floor
from 6/2008 to 5/2009 was 4.38%

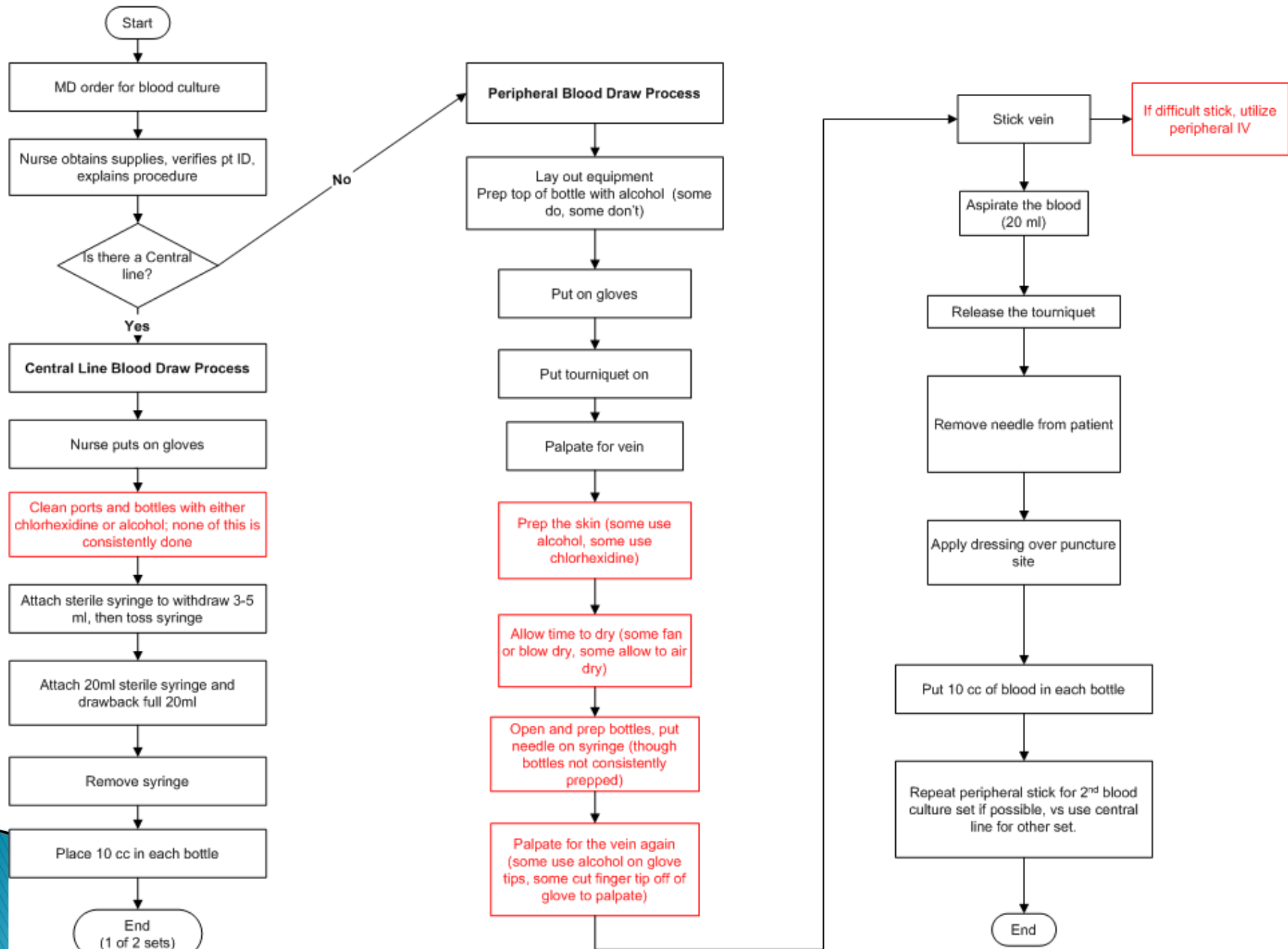
Selected Process Analysis Tools

Fishbone – This helped organize brainstorming sessions to analyze what areas could be improved to decrease the contamination rates of blood cultures.

Flowchart – This helped to break down the process to isolate individual points in the process that needed improvement.



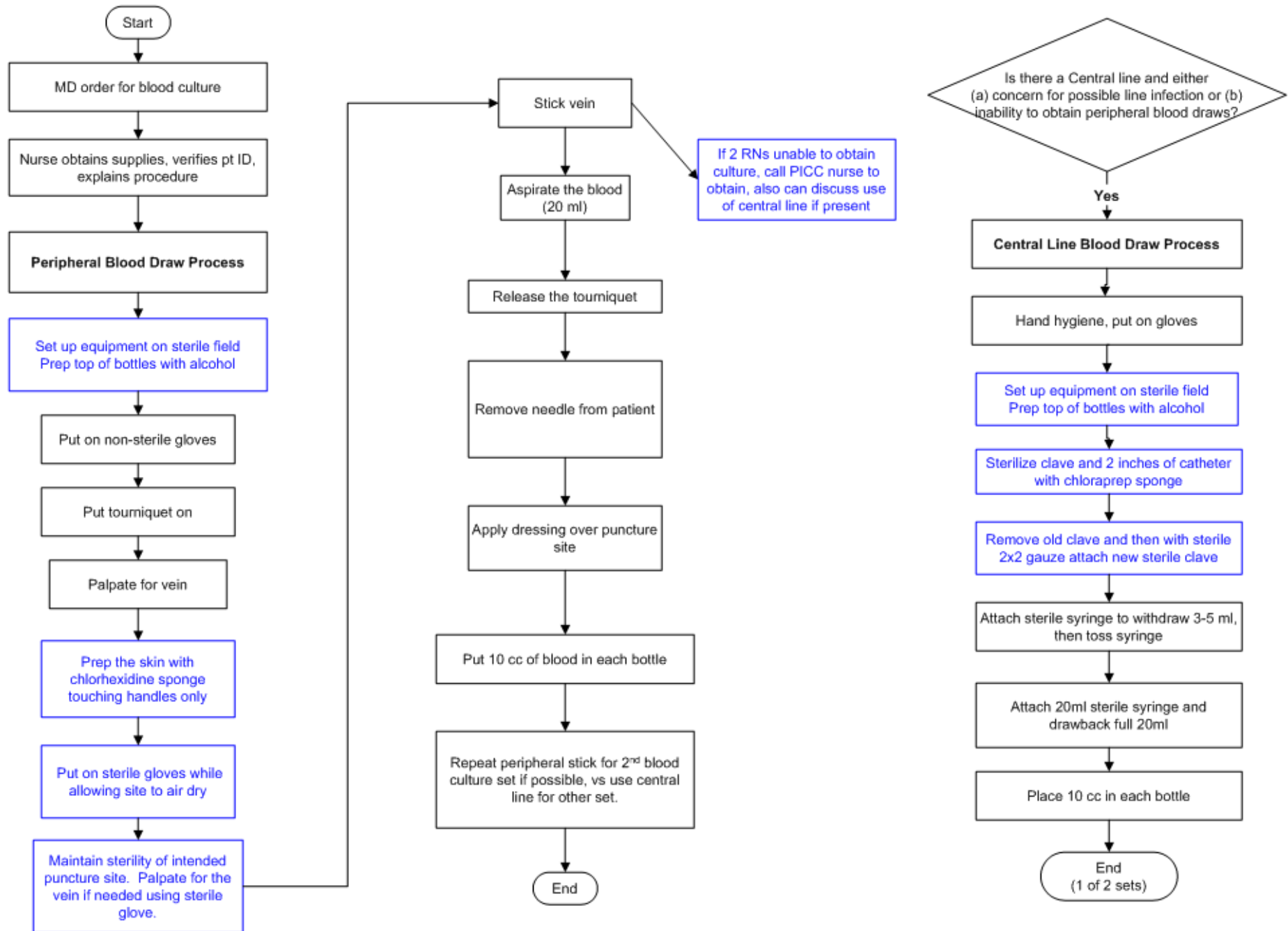
Pre-Intervention Process for Drawing Blood Cultures



What Changes Can We Make That Will Result in an Improvement?

- ▶ Standardize sterilization of skin with chlorhexidine.
- ▶ Avoid contamination of sterilized site prior to blood draw.
- ▶ Sterilize claves with chlorhexidine, switch claves on central lines.
- ▶ Avoid use of peripheral IV lines for blood culture draws.
- ▶ Use standardized kits that have all supplies ready for the nurses.
- ▶ Feedback to nurses regarding their contaminated blood cultures.

Post-Intervention Process for Drawing Blood Cultures



Intervention

Plan

- ▶ We worked with nurses on the 8th floor of the University Hospital to establish sterile technique and to standardize the process.
- ▶ We held brainstorm sessions with nursing to develop a viable process using equipment and a model arm.

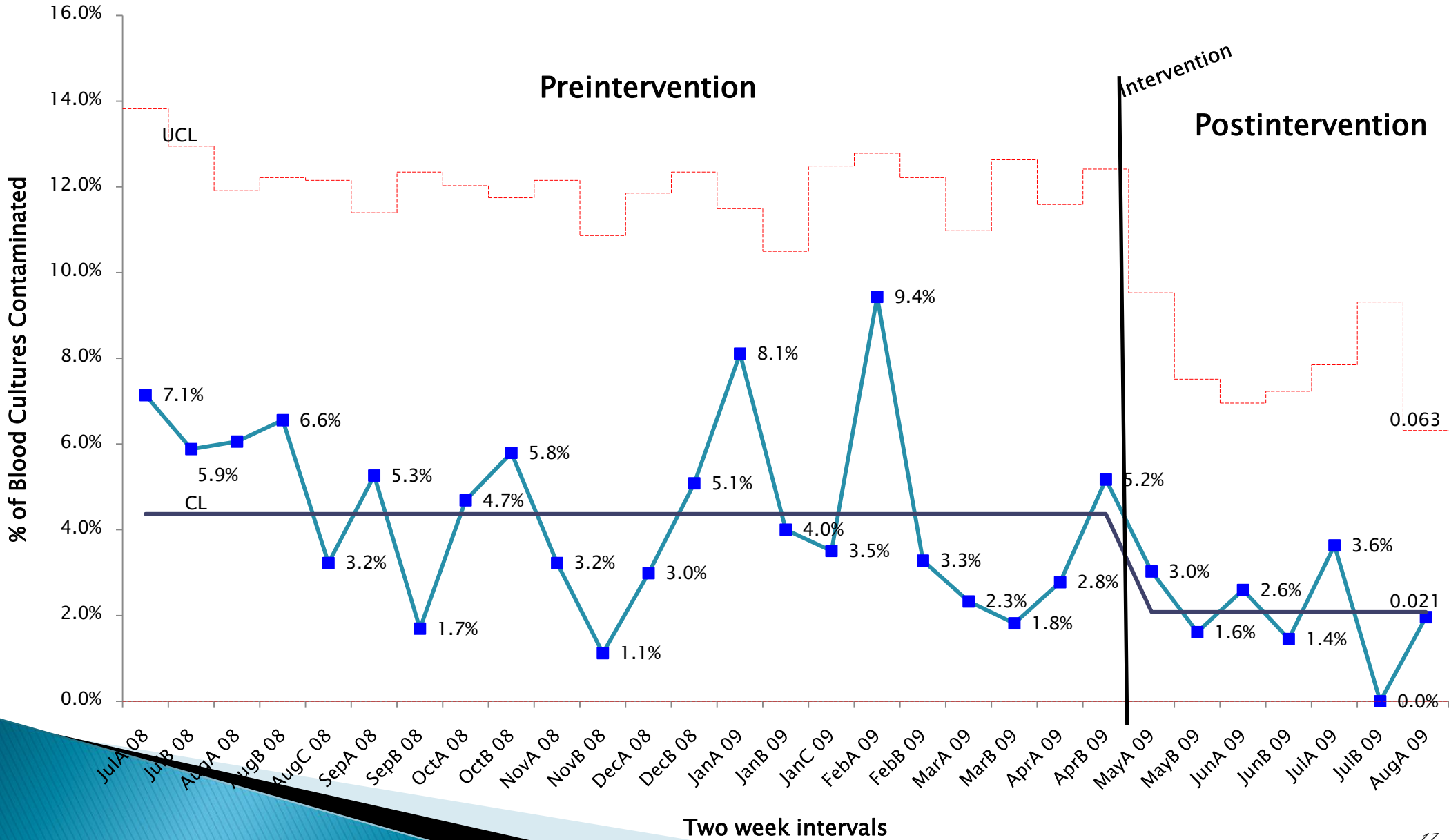
Implementing the Change

Do

- ▶ Nursing champions carried out training sessions with a check-list using an arm and a sample kit. They started this in May '09. This involved the education of 55 nurses on both day and night shifts.
- ▶ Nursing developed a kit that stream-lined their process so all of the supplies were readily available.



Contaminated Blood Cultures on 8th Floor of UH



Expansion of Our Implementation

Act

- ▶ We are working to roll out the intervention to other patient care areas. The ER has started work on this project.
- ▶ We are working at expanding availability of the PICC team to 24/7 coverage, and they may ultimately serve as a phlebotomy service for blood cultures.
- ▶ We are working with IT to streamline the work of obtaining data to monitor for sustained improvement. IT will also work to provide individual feedback to nurses regarding contamination rates.

Return on Investment

- ▶ Decreasing our rate of blood culture contaminants in five patient care areas from 6.2% to 2% could lead to savings of as much as \$535,000 to \$2.3 million, and save from 535 to 2400 days of unnecessary length of stay.

Conclusion/What's Next

- ▶ We have successfully decreased the blood culture contamination rate on 8th floor of UH to an average of 2.08% from the prior average rate of 4.38%.
- ▶ We will need to follow the data over time to determine if this impact is sustained.
- ▶ The process improvement will be implemented in other patient care areas of University Hospital.
- ▶ The impact of this change can significantly improve the quality and safety of our patient care as well as lead to significant economic savings for our healthcare system.

References:

- ▶ Bates, D. W., L. Goldman, and T.H. Lee. 1991. Contaminant blood cultures and resource utilization: the true consequences of false positive results. *JAMA* 265: 365–369.
- ▶ Souvenir, D., et al. 1998. Blood cultures positive for coagulase–negative staphylococci: antisepsis, pseudobacteremia, and therapy of patients. *J. Clin. Microbiol.* 36: 1923–1926.
- ▶ Weinbaum, F.I. et al. 1997. Doing it right the first time: quality improvement and the contaminant blood culture. *J. Clin. Microbiol.* 35: 563–565.
- ▶ Weinstein, M.P. 2003. Blood Culture Contamination: Persisting problems and partial progress. *J. Clin. Microbiol.* 41:2275–2278

Thank you!



Educating for Quality Improvement & Patient Safety