

Project Submission:
2009 Delaware Valley Patient Safety Award

ABINGTON MEMORIAL HOSPITAL

*“Development of the
Central Venous Catheter Maintenance Bundle”*

Abstract:

Proper insertion of central lines is undoubtedly a key step in the prevention of infection, but this is not the only step leading to zero infections. When infections happen days to weeks after insertion, line maintenance certainly plays a role. Considering that Pronovost's work is the foundation of a well developed central line management program, we need building blocks on top of the foundation. Getting to zero, or as close to zero as possible requires a maintenance bundle.

Establishment of care practices surrounding central venous catheter care is essential at guiding the formation of a maintenance bundle. We used a questionnaire to assess nursing beliefs and practices related to central line care. A multi disciplinary panel of experts reviewed the questions for difficulty and validity. Questionnaire items receiving a score less than 90% were developed into bundle points and point of care education plans.

Audits were conducted to evaluate compliance of bundle concepts, and effectiveness of education. Central line related blood stream infection (CLABSI) cases were discussed with staff, in order to intervene if care of that line was affected by systems or practices. Culminating the culture, beliefs, actual care, and analysis of obstacles to optimum care led to formation of our maintenance bundle.

We were successful at our goal of decreasing average monthly CLABSI rate per 1000 line days by at least 25% in all units of our several hundred bed institution averaging 1,999 central line days per month.

Title:

Development of the Central Venous Catheter Maintenance Bundle

Goals:

- Develop a universal, deployable central venous catheter maintenance bundle.
- Combine our maintenance bundle with an existing robust central venous catheter insertion bundle.
- Decrease the overall institutional average monthly central venous infection rate per 1000 central line days by at least 25%.

Base Line Data:

- January, February, and March of 2008 were our baseline average rate months.
- The neonatal intensive care unit was excluded from this project.
- The average monthly institutional wide baseline data was 3.85 per 1000 central line days.

Interventions:

Establishment of an understanding of the care practices surrounding comprehensive central venous catheter care will be essential at guiding the steps in order to establish a maintenance bundle. A questionnaire was used to assess the current beliefs and practices related to line care. A multidisciplinary panel of experts reviewed the questions for difficulty and validity. Critical care nurses were chosen due to the amount of contact they have with central venous catheters enabling a greater number of

respondents. Results were tabulated and questionnaire items receiving a score less than 90% were developed into formalized institution wide education plans executed through bedside focused point of care interventions.

Comprehensive audits were conducted to evaluate compliance of bundle concepts, and effectiveness of educational programming. Actual central line related infection cases were discussed with staff when identified, in order to gain knowledge and intervene if care of that line was affected by systems or practices. Culminating the culture, beliefs, actual care, and analysis of obstacles to optimum care of real cases led to formation of our maintenance bundle, and supportive structure.

Overall success is measured through infection outcome data calculated as infection rate per 1000 central line days. Central line is defined as a line terminating in the SVC. Femoral lines are included in our definition of a central line. Determination of CLRBSI is performed by Nurse Infection Preventionists following CDC NHSN criteria.

Definition of the Maintenance Bundle:

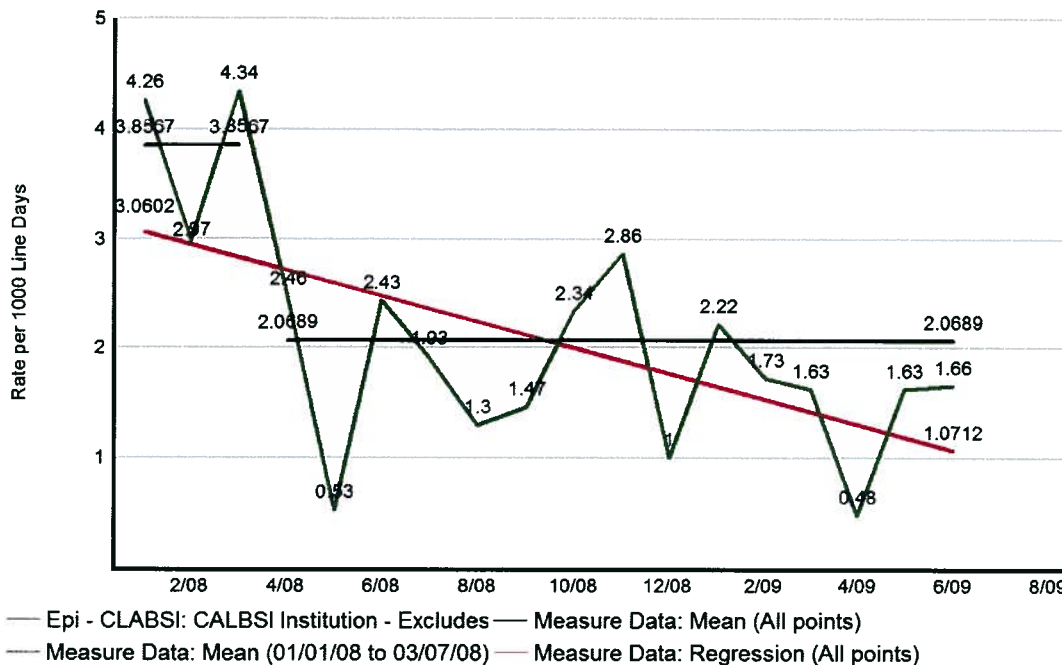
Through careful review of literature and definition of best practice, in combination with knowledge gained through the aforementioned assessment data, our maintenance bundle encompasses the following pieces:

- Daily review and documentation of line necessity.
- Daily documentation of site appearance.
- Dressing is always initialed and dated with date of last dressing change
- Dressing changed once a week and PRN (only if dislodged or non- adhered.)
- Weekly and PRN dressing changes documented.
- Cluster blood draws, limit access, keep closed systems closed.
- Cultures should only be drawn from central lines as a last resort.
- Use of an occlusive dressing containing a CHG delivery system.
- End cap changes with weekly dressing changes.
- Use of a CHG product for site care at dressing change.
- Clean the hubs for at least 15 seconds with alcohol when accessing ports or IV tubing.
- Employ a dressing change kit that includes at least:
 - PPE including mask and sterile gloves
 - Occlusive sterile CHG containing Dressing
 - Sterile tape
 - CHG site care/ skin cleansing product
 - Luer activated end caps (at least three)

Results (1graph):

- **Institution (combined M/S and CC)**

Epi - CLABSI: Institution - Excludes NICU - CLABSI Rate Per 1000 Line Days - Graph



Replication:

The bundle was designed to be reproducible in many environments. The kit uses materials and equipment readily available in the healthcare setting. Other key bundle elements are behavioral based and require auditing and feed back to frontline staff in order to exact change in practice. The modular nature of the bundle allows for a wide variety of customization, but allows for pieces of it to be rolled out over time. An institution can start with the kit, and then move on to audits and feedback. The simplified workflow and equipment availability the kit assures compliments the later building blocks of auditing and frontline feedback.