

# Working Together to Reduce Central Line Associated Blood Stream Infections

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Central line associated blood stream infections (CLABSI) in neonates are associated with significant increase in morbidity, mortality, duration of hospital stay, cost of care and lead to poor neurodevelopmental outcomes. Reducing central line associated infections can lead to better survival and outcomes in neonates.

In the last 2 years, The National Neonatal Audit Programme has utilized the Badgernet database to benchmark data on CLABSI rates for neonatal units across the UK. Our tertiary neonatal unit started participating in the Scottish Patient Safety Programme in 2014-2015. The aim was to reduce harm and provide best quality of care for the babies admitted with us.

**Central line associated blood stream infection is defined as:** A positive growth from blood culture with a central line in place 72 hours after birth.

**CLABSI rates** are expressed as total number of CLABSI episodes per 1000 central line (CL) days.

Our unit's CLABSI rate in the first half of 2015 was 25.5/1000 CL days. The CLABSI rate due to *Staphylococcus aureus* in 2015 was 5.6/1000 CL days.

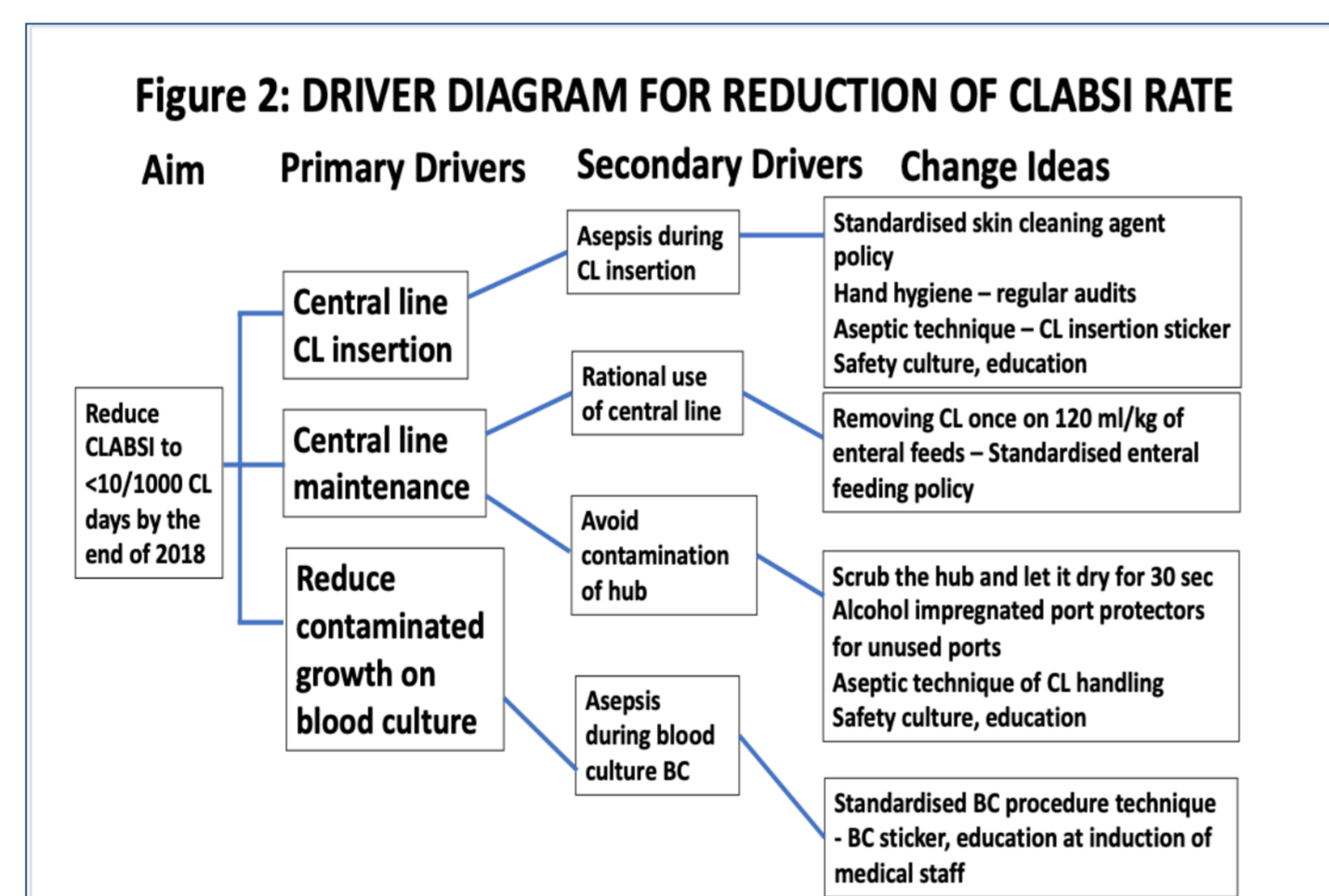
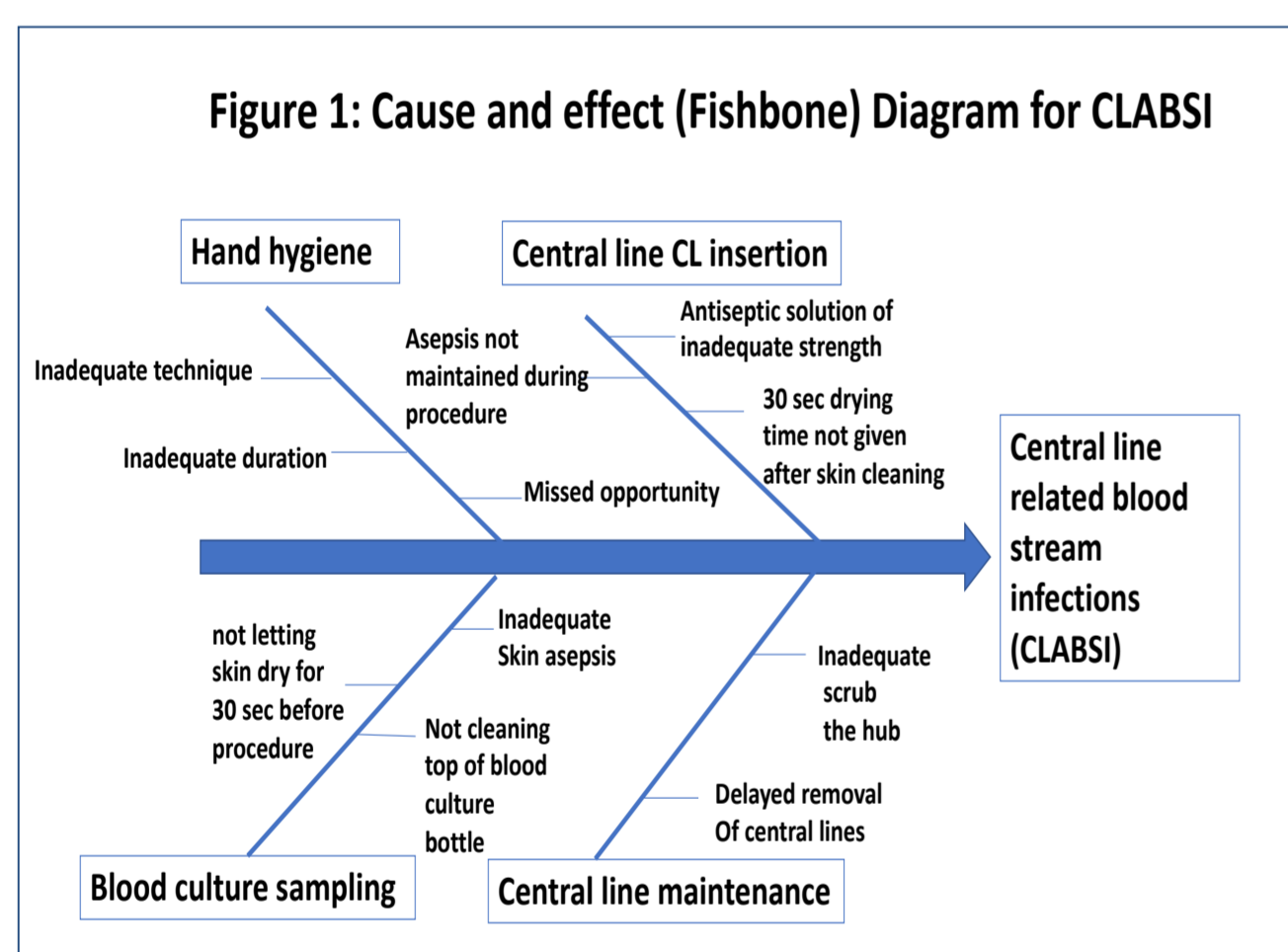
**Aim:** The aim of our infection control team was to reduce CLABSI rates in our unit to <10/1000 CL days by the end of 2018.

## Method

We organised a meeting with representatives from nursing and medical staff and discussed the ways to improve. The cause and effect relationships (Figure 1) were studied to identify targets for improvement. The leading concerns were contamination of blood culture samples, poor asepsis during line insertion and maintenance and poor hub care. **Data** were collected prospectively - from case notes, online patient databases and monthly blood culture results.

## Process Change

We introduced "Changes" in a stepwise way, shown in the Driver Diagram (Figure 2). Key changes were; a blood culture sticker to record and prompt for proper technique; training of doctors in correct method of sampling for BC during induction; Central line insertion and maintenance bundle; to scrub the hub and wait for 30 seconds and use of alcohol impregnated port protectors on unused line ports.



## Achievements



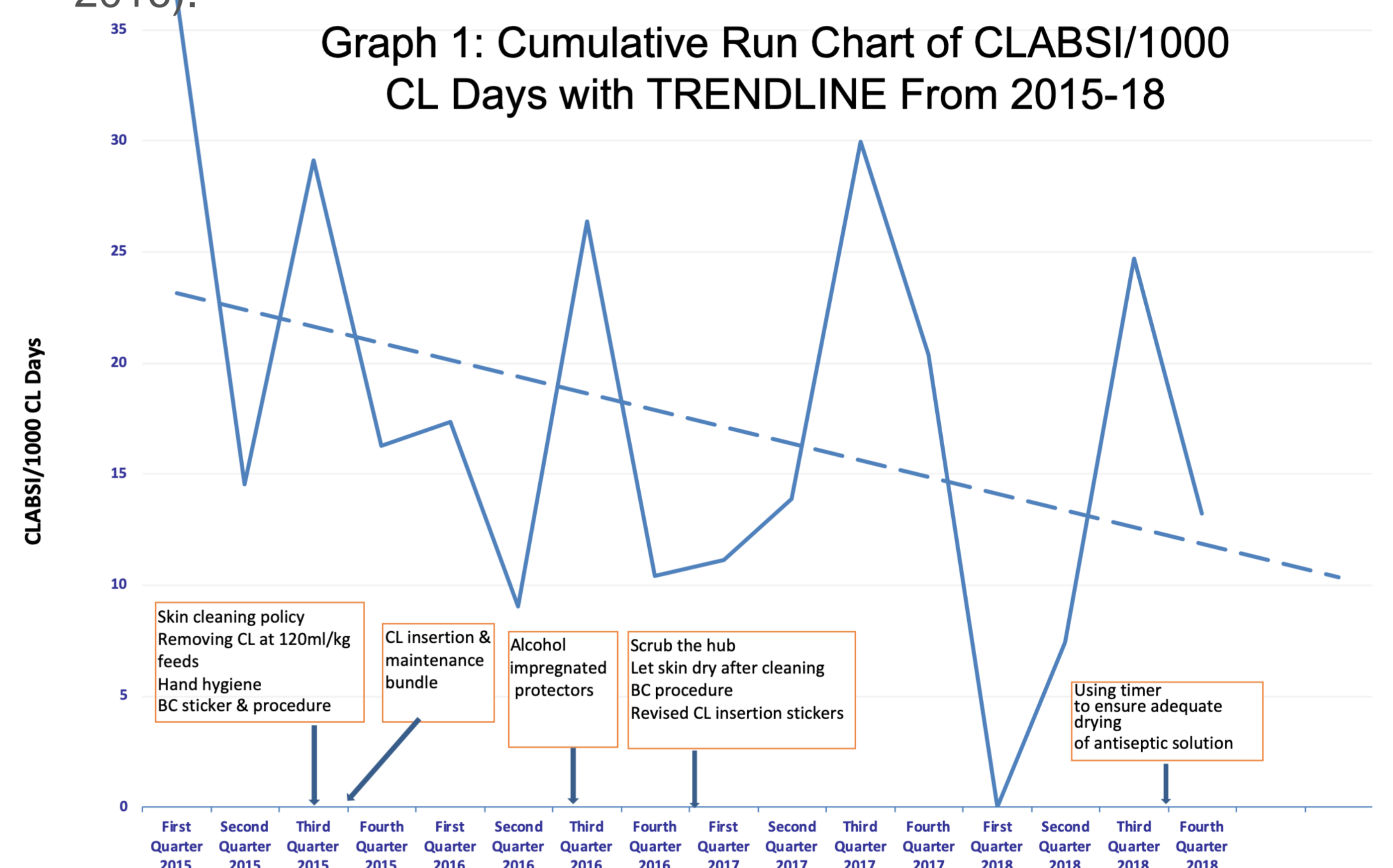
## Key Learning Points

**Change Bundle:** The bundles introduced have significantly helped to reduce infection and have potential to reduce CLABSI in similar units.

**Staff Motivation:** We engaged our staff with teaching and training sessions, sharing the results regularly and displaying the data in a visual form to give them a sense of achievement and ownership. This has been the key to achieving success.

## Results

CLABSI rates were reduced to 15.8/1000 CL days in 2016, went up to 18.8/1000 CL days in 2017 and came down to 11.3/1000 CL days in 2018. No episode of *Staphylococcus Aureus* CLABSI recorded after introduction of alcohol impregnated port protectors (in 2<sup>nd</sup> half of 2016).



## Conclusions

Incremental QI based interventions have shown a significant and sustained improvement in our average CLABSI rates. We have demonstrated 54% reduction in our central line associated blood stream infection rates (reduced from baseline of 25.5/1000 CL days to 11.3/1000 CL days). The data supporting this is shown in run chart (Graph1) with a clear trend line towards improvement. Its an ongoing project and we are striving for further improvement.

Reduced infection rates lead to better quality of care, less iatrogenic harm, and are associated with reduced mortality and treatment costs.

We are progressing towards and have partially achieved our stated aim, albeit now with a longer time scale. We are involved in further work on compliance with policies, education and staff motivation, especially at the time of induction of new medical and nursing staff, to maintain and further reduce the infection rates.

## Scale / Spread

We have already shared our project and its result as poster in the **Reason Neonatal Conference 2019** and as a free paper/ oral presentation in **Evidence and Excellence in Perinatal Care - BAPM and EBNEO Conference 2019**. This project won the best QI poster award at the Reason Conference. In addition, we have shared our experience with the **NHS GGC Neonatal QI Collaborative** and many of the individual interventions have been introduced into other neonatal units in our network.