The Escherichia coli Bacteraemia Quality Premium: Is a 10% reduction possible using Quality Improvement Techniques?

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The ambition was discussed at a CCG education day, deteriorating Haematology admissions predominated (11/30 (33%) had urine cultures taken on the same day or the day before an Haematology admission). The commonest underlying diagnosis was neutropenic sepsis (9/30 – 30%).

Baseline hospital onset E. coli bacteraemia rates for the financial year (FY) 2016-2017 were plotted on a Statistical Process Control Chart (SPC) and Pareto chart to highlight focused areas of work.

The first 30 sets of consecutive notes with hospital onset E.coli bacteraemia from April 2017 were reviewed for preventable themes.

Methods

Aim & Background

Clinical Commissioning Groups (CCGs) are leading on achieving Quality Improvement and Multidisciplinary teams are delivering increased E. coli bacteraemia rates. However, there is lack of evidence-based infection control practices for the prevention of community acquired E.coli bacteraemia. The commonest underlying diagnosis was neutropenic sepsis (9/30 – 30%).

The improvement plan was discussed with performance managers and patient steering groups.

Baseline hospital onset E. coli bacteraemia rates for the financial year (FY) 2016-2017 were plotted on a Statistical Process Control Chart (SPC) and the Pareto chart to highlight focused areas of work.

Catheter training across the trust has been updated to include infection control, Camden CCG, Commissioning Support Unit, Public Health England, UCLH Improvement, a continence nurse and hospital epidemiologist was assembled. Qualitative themes emerged through discussion and aims were scoped and defined. A project charter with SMART objectives was agreed upon.

Dehydration and constipation were noted, particularly amongst the elderly. Documentation was limited to nursing notes.

Where were most Hospital Onset E.coli Bacteraemias drawn at UCLH in 2016-2017?

Pareto chart to identify key preventative themes

Statistical Process Control Chart – Weekly Baseline Hospital Onset E.coli bacteraemias FY2016-2017

Fig. 1 Pre-intervention baseline SPC chart demonstrates expected seasonal variation in E. coli cases with a statistically significant outlier on 18/4/16 representing Special Cause Variation. This may have been due to statistical factor on one ward.

Fig. 2 Pareto Chart – Hospital onset E.coli bacteraemias by ward for FY2016-2017. Letters on x-axis relate to clinical specialty. Haematology wards are highlighted in dark green.

Results

In 2016-17, UCLH had 269 E.coli bacteraemia cases. 152 were community onset and 117 hospital onset.

Haematology admissions predominated (11/30 – 37%). The commonest underlying diagnosis was neutropenic sepsis (9/30 – 30%).

15 cases (50%) had a urinary catheter during their hospital stay. Documentation was confined to nursing notes.

10 (33%) had urine cultures taken on the same day or the day before an E.coli blood culture.

Conclusions

Catheter training across the trust has been updated to include infection control and clear documentation in medical notes.

Survey data has been presented at clinical governance meetings to microbiology, infectious diseases and haematology.

The ambition was discussed at a CCG education day, deteriorating patient steering group and trust audit committee with intent to embed into trust wide audit and CI.

The improvement plan was discussed with performance managers and presented at the executive shadowing programme.

The outcome measure will be numbers of E.coli bacteraemias at UCLH. Statistically significant reductions will be detected by the SPC chart presented in response to PDSA (Plan-Do-Study-Act) cycles.

Clinical fellowship funding has enabled high quality multidisciplinary survey, early feedback and board to ward engagement around a quality improvement cycle. We hope to achieve the 10% reduction as a result of this work.

Fig. 3 Abbreviated Driver Diagram: Key change ideas on current focus of work