COMPARISON OF COMPLIANCE VS INCIDENCE OF LINE RELATED BACTERAEMIA

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Senior Infection Prevention & Control Nurse
(On behalf of the Infection Prevention & Control Team)
OVERVIEW

• Why were we interested in Curos

• Pre Curos Intervention

• Curos Intervention

• Impact of Curos
WHY WERE WE INTERESTED IN CUROS?

- Knowing that we had higher than average BSI’s
- Aware that there was non compliance of scrub the hub
- Liked the concept of Curos
- Engineers out human variation
- History of partnership working with Vygon
WHY DID WE CONDUCT A CUROS STUDY?

- Only British evidence for Curos was home parenteral nutrition outpatients (Mia Small)

- Wanted to know if using Curos would improve compliance with port cleaning

- Would there be a positive / negative affect on line related bacteraemia rates with improved port decontamination
WHO DID WAS INVOLVED IN THE PROCESS?

- Infection Prevention & Control Team
- Infection Prevention & Control Group
- Evidence based Practice Committee
- Divisional Nurses
- Matrons
- Ward managers and their staff
- Procurement
- Vygon
WHAT CHALLENGES DID WE FACE?

• EPIC 3 Guidelines recommend CHG

• Motivating colleagues – initially seen as not part of Aseptic Non Touch Technique (ANTT) and potential for confusing staff

• Procurement – cost
HOW DID VYGON SUPPORT WITH THESE CHALLENGES?

• Provided the product free for the trial
• Spoke to Stephen Rowley who owns the ANTT idea/concept and had Curos recognised as part of the ANTT process
• Updated our trust ANTT vascular access posters to incorporate Curos
• Provided benchmarking audits, staff training and monthly audits for the duration of the trial
DESIGN OF THE STUDY?

- Cross site study utilising 4 wards – all contained patients who had medium to high use of Intravascular lines
- Retrospective review of the wards BSI data for 6 months prior to study
- Port cleaning survey pre study
- Training of staff in Curos use prior to study
- Procurement re removal of wipes for duration of study
- Monthly audits whilst study underway
Pre Curos Intervention
PORT CLEANING SURVEY

This survey had 104 responses from a variety of different departments:

- Women's and Children's Services
- Medical
- Surgical
- Renal
- Cancer Services
- Emergency Medicine
- Critical Care and Anaesthetics
- Diagnostics

The National guidelines show that the requirement for effective device disinfection relies on three key factors:
PORT CLEANING SURVEY

- Cleaning technique of the clinician
  (scrubbing or twisting action required)

- **The duration of the physical cleaning**
  (min of 15 sec)

- **The duration of the disinfectant drying / Kill time**
  (min of 30 sec)
CLEANING TIME

National

- 5 Seconds or Less: 28%
- 10 Seconds or Less: 26%
- 15 Seconds or Less: 20%
- 20 Seconds or Less: 18%
- 25 Seconds or Less: 8%
- 30 seconds or Less: 1%

=46%

BHR

- 5 Seconds or Less: 24%
- 10 Seconds or Less: 28%
- 15 Seconds or Less: 15%
- 20 Seconds or Less: 5%
- 25 Seconds or Less: 0%
- 30 seconds or Less: 0%

=54%
CUROS INTERVENTION PERIOD

• 4 Wards across 2 hospital sites
  – Oncology
  – Acute Care of the elderly
  – Adult Intensive care
  – Surgical Ward

• Curos was used for 6 months

• Compliance for Curos was audited monthly
CUROS INTERVENTION PERIOD

- CRBSI’s were audited monthly by ward
- Users completed a questionnaire on usability
- BSI rates audited for 6 months post Curos Intervention
- Business case raised
STUDY RESULTS

– Clinical practice compliance rates
– Infection rates
– Financials (Tangible/non-tangible)
– User experience
– Patient experience
The compliance rates recorded during the 6 month clinical evaluation for the use of the Curos verses current cleaning survey compliance were:

<table>
<thead>
<tr>
<th>Department</th>
<th>Compliance to current cleaning practice</th>
<th>Compliance to Curos cleaning practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madarin B (Queens)</td>
<td>No Data available</td>
<td>81%</td>
</tr>
<tr>
<td>Harvet A (Queens)</td>
<td>No Data available</td>
<td>79%</td>
</tr>
<tr>
<td>ICU (KG)</td>
<td>No Data available</td>
<td>80%</td>
</tr>
<tr>
<td>Heather (KG)</td>
<td>No Data available</td>
<td>81%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>Clinical survey revealed 27%</td>
<td><strong>80%</strong></td>
</tr>
</tbody>
</table>

Curos has demonstrated a higher rate of compliance (80%) for the disinfection of needle free IV access devices compared to current cleaning practice (27%) of scrub the hub.
Prior to the implementation of the Curos disinfection cap in 2014, BHR analysed existing rates of catheter related blood stream infection on the 4 departments for 6 months (Oct-March). This revealed:

<table>
<thead>
<tr>
<th>Department</th>
<th>Total number of CRBSI for 6 months</th>
<th>Calculated number of blocked bed days (Infections x 11)</th>
<th>Cost to treat peripheral line infections (£6,209)</th>
<th>Cost to treat central line infections (£16,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madarin B (Queens)</td>
<td>14</td>
<td>154</td>
<td>£86,926</td>
<td>£224,000</td>
</tr>
<tr>
<td>Harvet A (Queens)</td>
<td>0</td>
<td>0</td>
<td>£0</td>
<td>£0</td>
</tr>
<tr>
<td>ICU (KG)</td>
<td>9</td>
<td>99</td>
<td>£55,881</td>
<td>£144,000</td>
</tr>
<tr>
<td>Heather (KG)</td>
<td>3</td>
<td>33</td>
<td>£18,627</td>
<td>£48,000</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>286</td>
<td>£161,434</td>
<td>£416,000</td>
</tr>
</tbody>
</table>
INFECTION RATE AND COSTINGS DATA

To allow for clinicians to get familiar with the use of Curos, the first month results have been isolated and demonstrated separately. The costings below are based on the proceeding 6 months data.

<table>
<thead>
<tr>
<th>Department</th>
<th>Total number of CRBSI for the first month</th>
<th>Total number of CRBSI for the proceeding 6 months</th>
<th>Calculated number of blocked bed days (Infections X11)</th>
<th>Cost to treat peripheral line infections (£6,209)</th>
<th>Cost to treat central line infections (£16,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madarin B (Queens)</td>
<td>3</td>
<td>2</td>
<td>22</td>
<td>£12,418</td>
<td>£32,000</td>
</tr>
<tr>
<td>Harvet A (Queens)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>£0</td>
<td>£0</td>
</tr>
<tr>
<td>ICU (KG)</td>
<td>0</td>
<td>2</td>
<td>22</td>
<td>£12,418</td>
<td>£32,000</td>
</tr>
<tr>
<td>Heather (KG)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>£0</td>
<td>£0</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>4</td>
<td>44</td>
<td>£24,836</td>
<td>£64,000</td>
</tr>
</tbody>
</table>

The most significant output from this clinical product evaluation was the noticeable decrease Curos had on CRBSI’s, from a pre intervention rate of 26 CRBSI’s down to a Curos intervention rate of 7 CRBSI’s. Curos delivered a reduction in CRBSI’s of 69. %
RESULTS
CRBSI’S VS COMPLIANCE

Comparison of Compliance Vs Incidence of Line Related Bacteremia
STATISTICAL ANALYSIS
VARIABLES ACCOUNTED FOR

Statistical Process Control on "CUROS"

Slit Start    Oct 2013    April 2014

UCL      = 12.3
Mean     = 4.3      1.5

Line-Related Infections without "CUROS" - Impregnated port-end.

Introduction of "CUROS" - mean reduction by 63%.

Slit Start    Oct 2013    Apr 2014
UCL      = 12.3
Mean     = 4.3      1.5
LCL      = N/A
DATA WITH WASH OUT PHASE

Comparison of Compliance Vs Incidence of Line Related Bacteremia

Pre Intervention Period

Curos Intervention Period

Post Curos Intervention Period

Curos Use Compliance Rate (%)
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Number of Line Related Bacteremias
0 1 2 3 4 5 6 7 8

Time in Months

Total Port Compliance All 4 departments
Line Related Bacteremia (LRB) All 4 departments
CUROS TRIAL COSTS

If the trust would have paid for the Curos product for the 6 months over the four mentioned wards, the cost to the trust verses current cleaning wipe in use would have been:

<table>
<thead>
<tr>
<th>Volume of product used</th>
<th>Cost of Current Cleaning pad NHSSC Price (Excl. VAT)</th>
<th>Total Spend (Excl. VAT)</th>
<th>Curos NHSSC Price (Excl. VAT)</th>
<th>Total Spend (Excl. VAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>26,374</td>
<td>0.025</td>
<td>£659.35</td>
<td>£0.26</td>
<td>£6,857.24</td>
</tr>
</tbody>
</table>

This works out to a product cost of £3,098.95 per department per year for adopting Curos.
TIME RELEASE

The time saved by not needing to scrub the hub and let it dry before every access is 45 seconds per Curos used. This has equated to a time releasing opportunity during the 6 month intervention on the four wards of:

<table>
<thead>
<tr>
<th>Volume of product used</th>
<th>Time Saving per Curos</th>
<th>Total Time Released to Care</th>
<th>Clinical Days Released to Care (8hr Day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>26,374</td>
<td>45 seconds</td>
<td><strong>329.7 Hours</strong></td>
<td>41.2 Days</td>
</tr>
</tbody>
</table>

The time released by using Curos instead of a wipe, enabled clinicians to care for patients for an average of 164.8 hours per year more, per department.
RESULTS DATA SUMMARY

Taking into account the savings from not having to treat avoidable catheter related bloodstream infections and the cost of the product for disinfecting needle-free devices on the four wards for a period of 6 months, the departments saved a minimum of £130,400 (peripheral line infections) up to £345,802.11 (central line infections), whilst saving 242 blocked bed days.

<table>
<thead>
<tr>
<th>Metrics</th>
<th>6 months pre Curos Intervention</th>
<th>6 months during Curos Intervention</th>
<th>Improvement Achieved with Curos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection Rates</td>
<td>26</td>
<td>7</td>
<td>19 Less (69%)</td>
</tr>
<tr>
<td>Compliance Rate</td>
<td>27%</td>
<td>80%</td>
<td>53% More</td>
</tr>
<tr>
<td>Blocked bed Days</td>
<td>286</td>
<td>44</td>
<td>242 Less (84.6%)</td>
</tr>
<tr>
<td>Cost to treat PIV -CRBSI’s</td>
<td>£161,434</td>
<td>£24,836</td>
<td>£136,598 Less</td>
</tr>
<tr>
<td>Cost to treat CLA -CRBSI’s</td>
<td>£416,000</td>
<td>£64,000</td>
<td>£352,000 Less</td>
</tr>
<tr>
<td>Cost of Product</td>
<td>£659.35</td>
<td>£6,857.24</td>
<td>(£6,197.89 ) Cost</td>
</tr>
<tr>
<td>Total Cost to treat PIV -CRBSI’s</td>
<td>£162,093.35</td>
<td>£31,693.24</td>
<td>£130,400.11 Saving</td>
</tr>
<tr>
<td>Total Cost to treat CLA -CRBSI’s</td>
<td>£416,659.35</td>
<td>£70,857.24</td>
<td>£345,802.11 Saving</td>
</tr>
</tbody>
</table>
USER FEEDBACK ON CUROS

18 nurses from across the four wards were randomly selected to complete anonymous feedback on Curos

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy to use</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>More effective than scrub the hub</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Improves patient outcomes</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Visually auditable</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Received training</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Will continue to use</td>
<td>100%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Results - Patient experience

1094 patients

Patients liked the visibility of Curos and knew when the device had to be changed

Made them feel safe and they felt in partnership with their care
WHAT ARE THE CONSEQUENCES OF CONTRACTING AN INFECTION?

People will forget what you said. People will forget what you did. But people will never forget how you made them feel.
QUESTIONS?