

Agenda Item (Ref)	16-17/51	Date of Meeting: 16 th July 2016
Report to	Infection Prevention Group	
Report Title	IV Team Annual Report	
Executive Lead	Nicola Firth, Director of Nursing and Quality	
Lead Officer	Debbie Wright, Assistant DIPC	
Action Required	Review	

Report purpose	A summary of the IV Team and IV Steering Group activity between April 2015-March 2016	
Strategic Objective (s) this work supports	Deliver outstanding care <input checked="" type="checkbox"/> Achieve best patient outcomes <input checked="" type="checkbox"/> Promote research and education <input checked="" type="checkbox"/> Deliver sustainable healthcare to meet people's needs <input type="checkbox"/> Provide strong system leadership <input checked="" type="checkbox"/> Be a well-governed and clinically-led organisation <input checked="" type="checkbox"/>	
Related Board Assurance Framework (BAF) risk	SR1 – Safe/Caring	
Business Plan Priority	AQUIP Reference –E1/QS1/03, E1/QS1/04, E1/QS1/05, E1/QS1/07, E1/QS1/10, E1/QS3/21	
Equality Impact Assessment required?	No	
Next Steps	Delivery of the IV plan for 2016/17	

REPORT HISTORY

Committee / Group Name	Agenda Ref	Report Title	Date of submission	Brief summary of outcome

Aintree University Hospital NHS FT – IV team annual report: a real world example
 This local annual report is an example used in the NICE medical technology guidance adoption support resource for SecurAcath for securing percutaneous catheters, and was not produced, commissioned or sanctioned by NICE.

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1. Executive Summary

The Annual IV Team Report provides an update on the progress and achievements against objectives set for 2015-2016. Key achievements in 2015/16 include;

- **897** VADs were inserted with **99.1%** success rate. **484** were midlines and **413** were PICCs.
- **373** were confirmed using the ECG Guided Tip Confirmation Method using the Nautilus machine.
- **11** referrals were received on average. **4** lines inserted daily and **7** carried over.
- Waiting time has increased from 1.7 to **2.4** days.
- LTIVA, difficult access, S-MTIVA & TPN were the most common reason for VA.
- Average dwell time = **13** days.
- **784** lines had positive outcome. **409** completed treatments, **201** were discharged home & **113** lines were removed due to complications.
- A complication rate of **14.0 per 1000** catheter days was reported for all PICCs and midlines inserted.
- CVAD SOP, CVAD Clinical Guidelines, PICC & Midline SOP, CVAD selection algorithm, CVAD Documentation, CVAD Passports & Competency Assessment Forms written and published.
- **1** MRSA, **14** MSSA bacteraemia, **2** CRBSIs & **25** CLABSIs attributed to IV access devices.
- AUH CRBSI rate was **0.09** per 1000 catheter days
- AUH CLABSI rate was **1.08** per 1000 catheter days.
- MSSA, CNS and Staph. Epidermidis were the most common causes of bacteraemia.
- The IV Team had undertaken **2,426** patient review episodes, **149** troubleshooting & **489** dressing changes.
- Alcohol impregnated caps (Curos), CHG impregnated dressing (Biopatch), ECG Tip confirmation system (Nautilus) was introduced for safety.

- The IV Team dealt with **62** out-patient episodes (26 troubleshooting, 36 line insertions)
- Training to **143, 197, 60, 50** staff on the IV Study Day, CVAD Management, HDSW & Doctors Training respectively. The IV Team was heavily involved in the ANTT Training.
- The IV team had undertaken **2** Trust-wide IV management audits, **1** ANTT and **1** Point Prevalence audit.
- IV Link Nurses have been identified in all wards. IV Resource materials were made available and meetings and trainings provided to the link nurses.
- Future developments include implementation of the VHP Framework trust-wide, building a novel approach to dealing with CLABSI cases and trial of a different midline brand.

2. Background

The Annual IV Team Report provides an update on the progress and achievements against objectives set for 2015-2016.

3. Key issues

3.1 IV Team Arrangements

3.1.1. IV Team

The Trust IV (intravenous) team was commissioned on August 2013. Rolly Ventura, IV Access Specialist Nurse took over from the first appointed IV Access Specialist Nurse in December 2014. A second IV Access Specialist Nurse Chris O'Loughlin, was appointed in August 2014 together with a seconded Clinical Support Assistant. The IV team was officially created in August 2014 consists of 2.0 WTE band 7 IV Access Specialist Nurses and 1.0 WTE Clinical Support Assistant.

The IV Steering Group was created on July 2014. The group is chaired by Debbie Wright. The initial work of the group is to look at the wider aspect of IV issues and improve the standards of IV management to reduce IV related infections and other complications. The teams sit with in the Trust Infection Prevention and Control Team.

Post	Post holder	WTE
IV Access Specialist Nurse	Rolly Ventura	1.0
IV Access Specialist Nurse	Chris O'Loughlin	1.0
IV Team Clinical Support Assistant	Catherine Evans	1.0

3.1.2 Reporting arrangements

The IV Team reports directly to the Assistant Director of Nursing for Infection Prevention and Control. The IV team manages the IV Steering Group, which in turn reports to the IPC Operational Group.

Group	Meetings
IV Steering Group	Two monthly

3.2 IV Team Service

3.2.1 The IV service was originally commissioned to insert medium and long-term intravenous devices to enable delivery of various therapies within the Trust. In addition, the aim of the team was to reduce all IV related infections and complications, including associated bacteraemia. The team's key responsibilities are as follow:

3.2.2 Key responsibilities include:

- To insert medium/long-term intravenous devices including PICCs and Midlines
- Assess, plan, implement and evaluate evidence-based practice in accessing and managing IV lines, programmes of evidenced based nursing care in relation to IV management and access
- To provide specialist advice and work closely with all AUH staff in relation to IV management and access
- To review and update of the Trust IV protocols and documentation
- To review, coordinate, and establish appropriate training for all staff involved in IV management
- To establish a process of regular competency testing for staff involved in IV care and management
- To provide specialist support to staff, patients and visitors in relation to IV management
- To establish a Trust-wide audit process for IV care and management
- To manage the IV Steering Group and IV Link Nurses Group

3.3 Objectives

3.3.1 The main objectives for the IV team in 2015-2016 were:

- To support the corporate infection prevention and HCAI reduction delivery plan 2015-2016 specifically to reduce IV related HCAs by April 2016.
- To support the Trust Quality and Safety Strategy 2015-2016 which encompass;
 - ✓ Care that is safe
 - ✓ Care that is clinically effective
 - ✓ Care that provides a positive experience for patients and their families

3.4 Evaluation

3.4.1 Table below summarizes the IV Team's goal aligned to the Trust quality and safety strategy.

Goal No.	Goal	Goal Alignment with Annual Plan
1	Quality improvement in IV Access provision	Care that is clinically effective

2	To monitor and reduce the risk of infection due to vascular access devices	Care that is safe
3	To monitor and reduce the risk of infection acquired via vascular access devices	Care that provides a positive experience for patients and their families
4	Pursuing quality improvement in IV Access provision	Care that is safe
5	To minimise harm across the organisation in relation to VAD related HCAs	Care that is safe and clinically effective

Majority of the objectives have been met, although day to day running of the service has been adjusted where necessary to meet clinical priorities.

3.4.2 Performance against the team Goal and Objectives;

Goal No.	Goal	Goal Alignment with Annual Plan
1	Quality improvement in IV Access provision	Care that is clinically effective

Objectives:

- *To raise awareness of AUH staff about the IV Team*
- *To support the Trust in providing IV access in accordance to national guidelines and maintaining the average time from patient referral to line insertion of 90% within 72hrs*
- *To standardise the processes involved in the insertion, care and ongoing management of vascular access devices*

Evaluation:

Objective: To raise awareness of AUH staff about the IV Team

IV Team advert have been made available in the wards. Posters and IV Resource folders containing IV Team contact details are available for staff use. On top of this, emails have been sent to key persons i.e. Heads of Nursing, Matrons, Ward Manager and Deputy Ward Managers, Consultant leads and IV Link Nurses regarding the service.

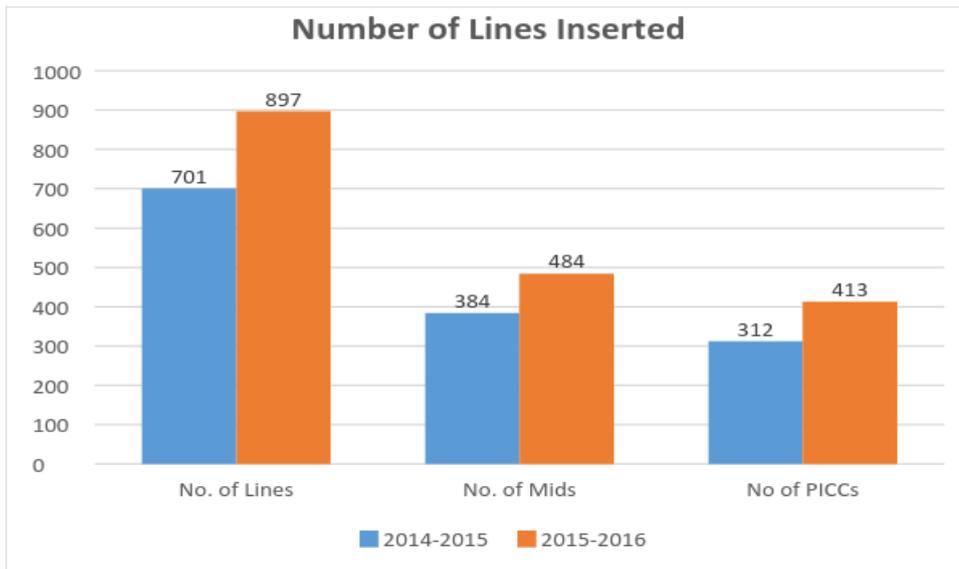
All IV related documents are on the Trust intranet and are available to all staff to access.

All data relating to VAD insertions by the IV team are displayed below in a series of charts.

Objective: To support the Trust in providing IV access in accordance to national guidelines and maintaining the average time from patient referral to line insertion of 90% within 72hrs

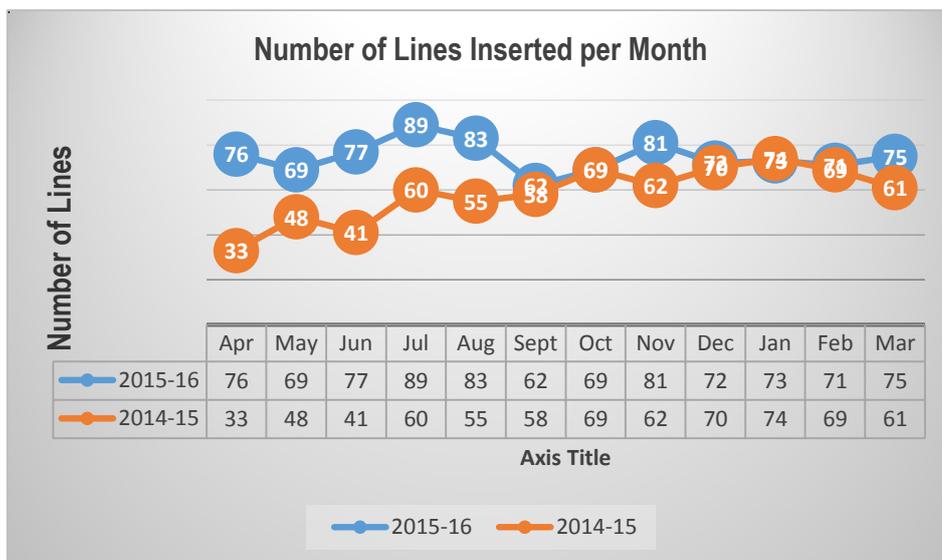
Number of PICCs/Midlines Inserted:

A total of 897 lines were inserted during 2015-2016. 196 lines or 21.9% more compared to last year. 484 were midlines and 413 were PICCs.



Number of lines Inserted per Month:

An average of 75 lines per month, 19 lines a week or 4 lines a day have been inserted. Compared to last year's 59 lines per month, 15 lines per week or 3 lines per day



Success rate



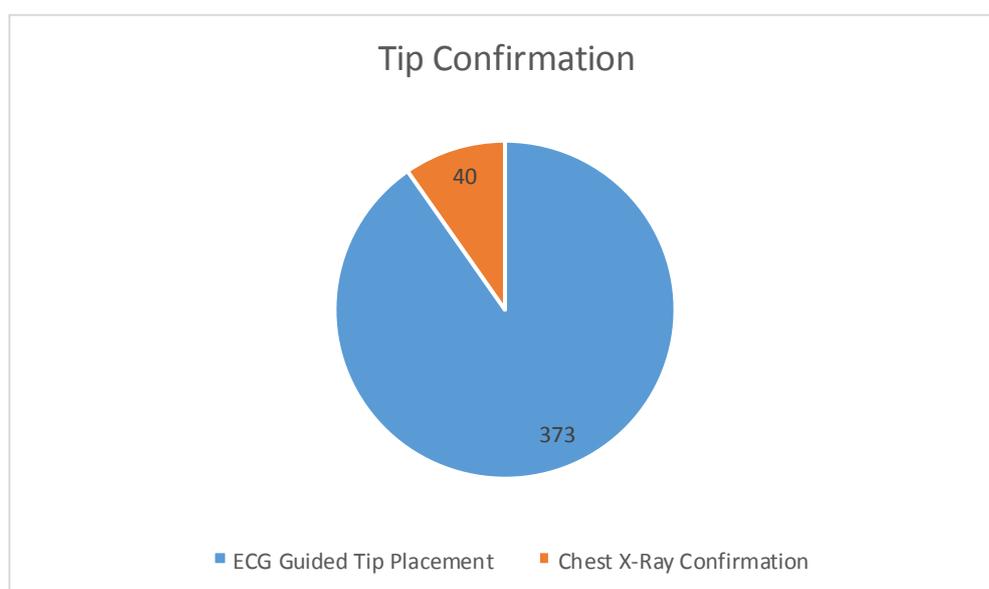
Published data suggest that success rates for PICC placements are around 70% for landmark techniques and 85-93% for ultrasound guided placements (Royer 2001). The IV team’s success rate in the insertion of all lines for 2015 – 2016 was 99.1%. This compares favourably to published data.

High success rates result in fewer referrals to Interventional Radiology and reductions in costs associated with radiological placement. Additional costs associated with delays in placement and inefficient use of equipment is also kept to a minimum.

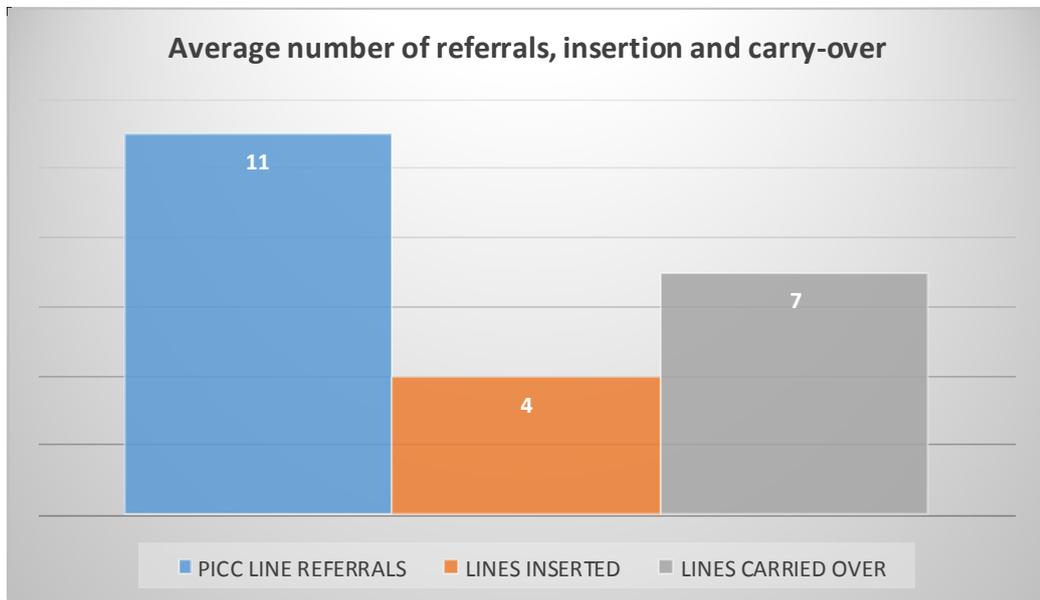
	Apr 2015 – Mar 2016
No. of Attempts	905
Successful	897
Unsuccessful	8
Success Rate	99.1%

Tip Confirmation Method:

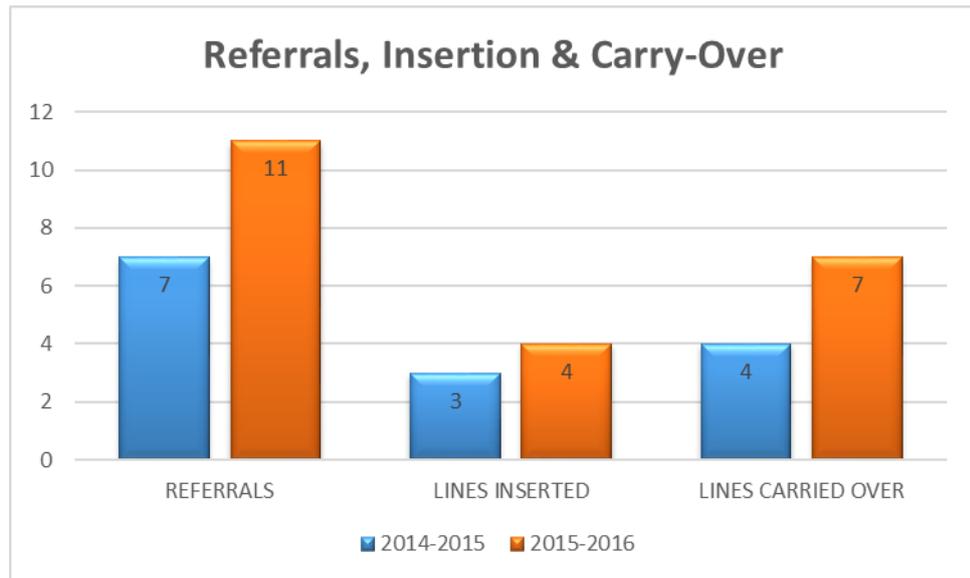
A total of 413 PICCs were inserted during 2015-2016. 373 or 90.3% of which were confirmed using the ECG Guided Tip Confirmation Method using the Nautilus machine. The remaining 40 cases, patients mostly with atrial fibrillation, utilized chest x-ray to confirm tip position.



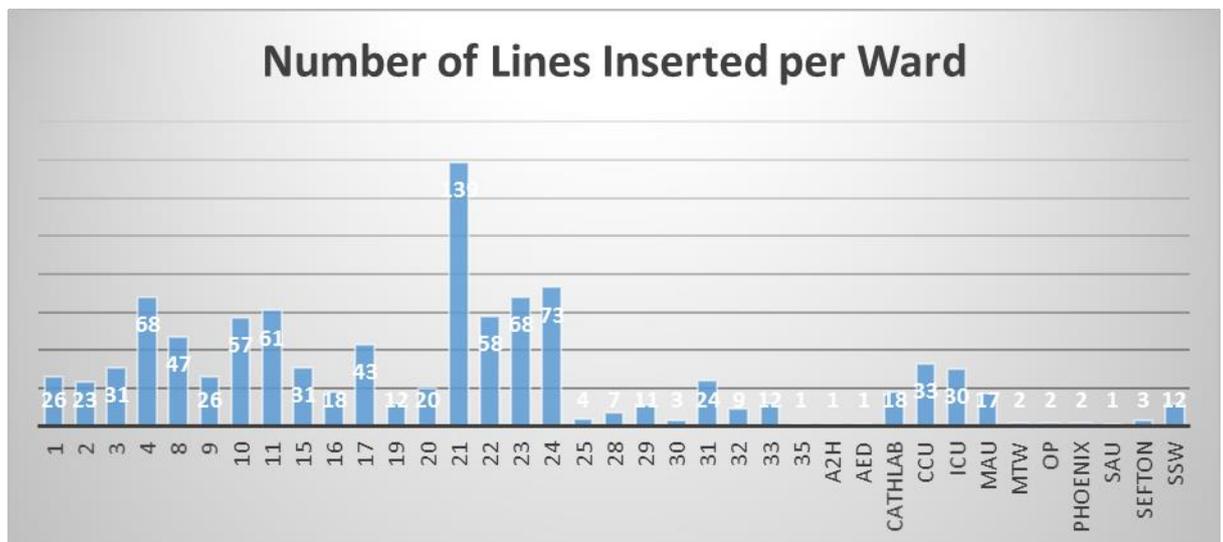
Number of referrals:



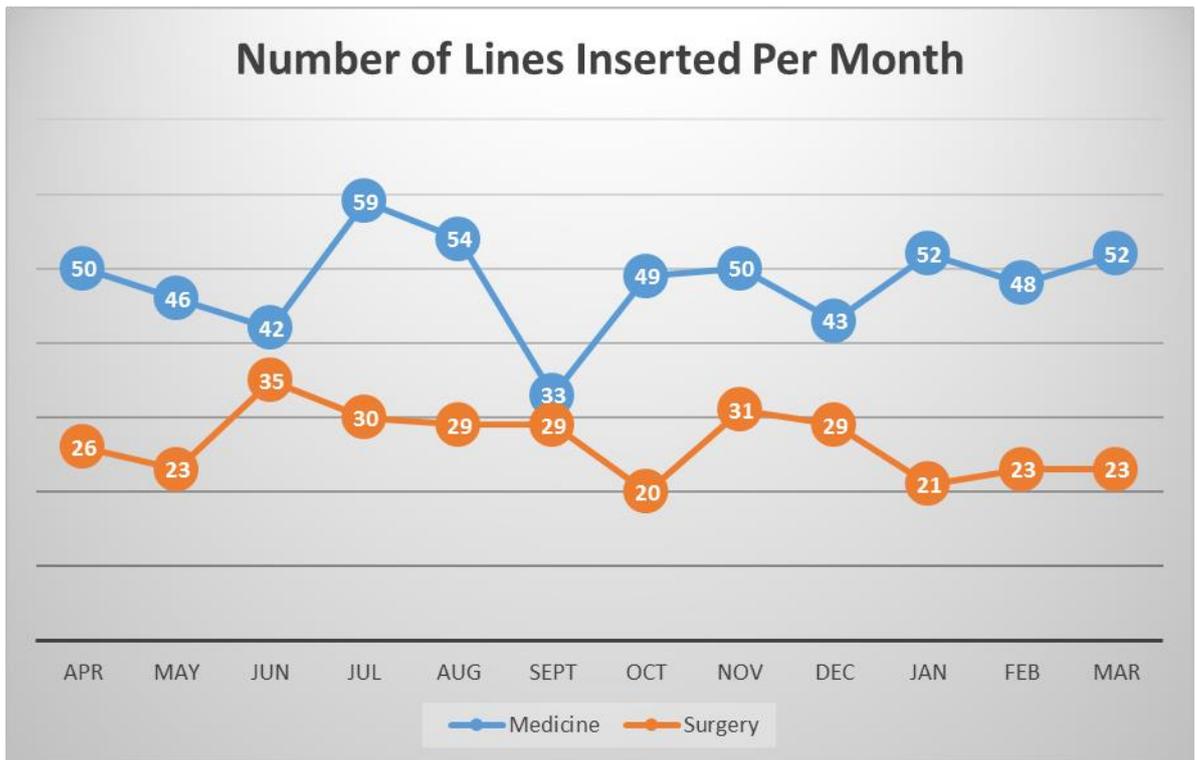
On average, the number of request was 11 per day. 4 lines were safely inserted per day. About 7 requests a day were carried over to the next day. This reflects a higher demand of IV access service as opposed to the supply delivered by the team.



Number of lines inserted per ward:

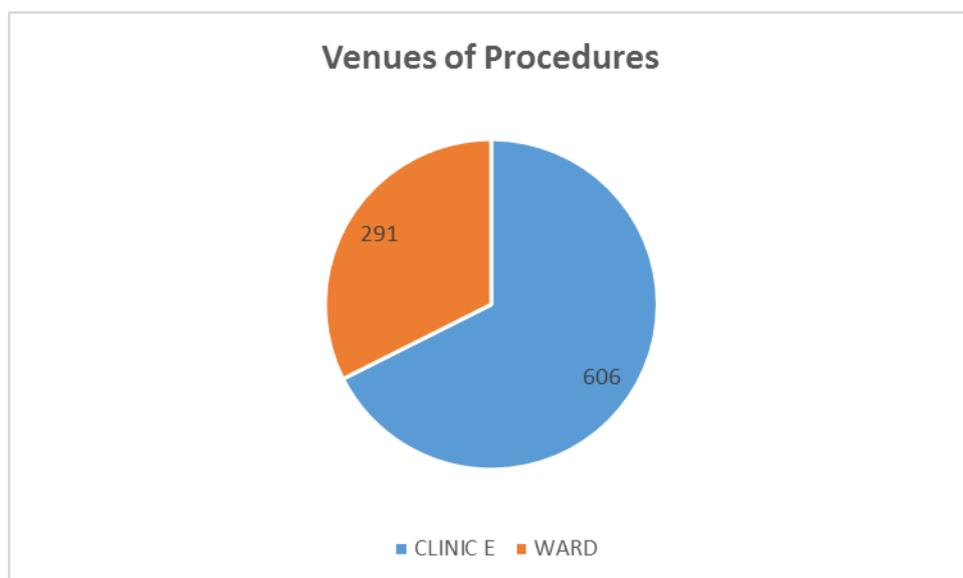


The chart above reflects that majority of the lines inserted were for Gastroenterology, Trauma and Orthopaedics, Diabetic, Thoracic and Haematology wards.



Place of insertion:

To comply with the national guidelines in terms of insertion of IV catheters i.e. medium and longer term lines inserted in dedicated procedure room, under ultrasound guidance and maximum barrier precaution. However, in situations like unstable patient condition, infection control barrier precautions, etc., lines were inserted in the ward.

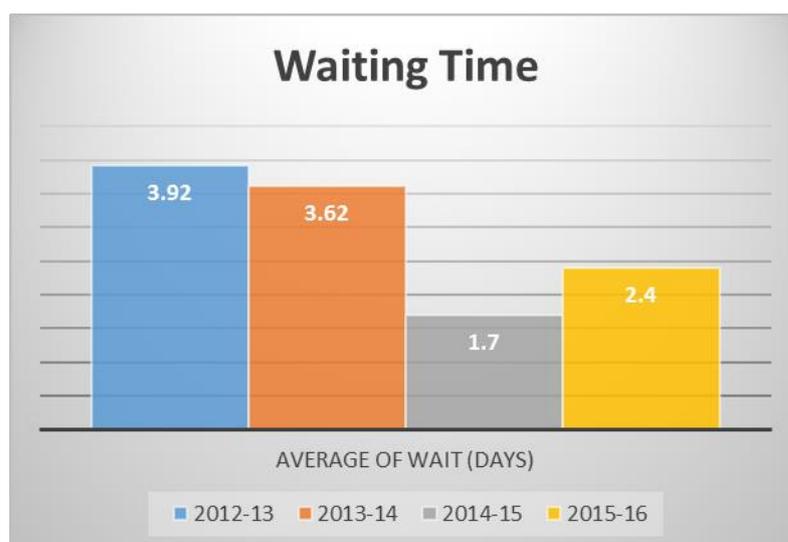


606 lines were inserted in dedicated procedure room. 291 lines were inserted in the ward for reasons that include: patient too unstable for transfer for procedure, infection control issues or unavailability of procedure room that can accommodate a bed.

Waiting times:



To support the Trust in providing IV access in accordance to national guidelines and maintaining the average time from patient referral to line insertion of 90% within 72hrs, the team have increased the number of lines inserted from 3 lines per day to 4 per day. Despite the move to increase insertion capacity, the waiting has increased from 1.7 days to 2.4 days. This can be attributed to the implementation on the Vessel Health and Preservation (VHP) Framework within Haematology and Cardiology Division.



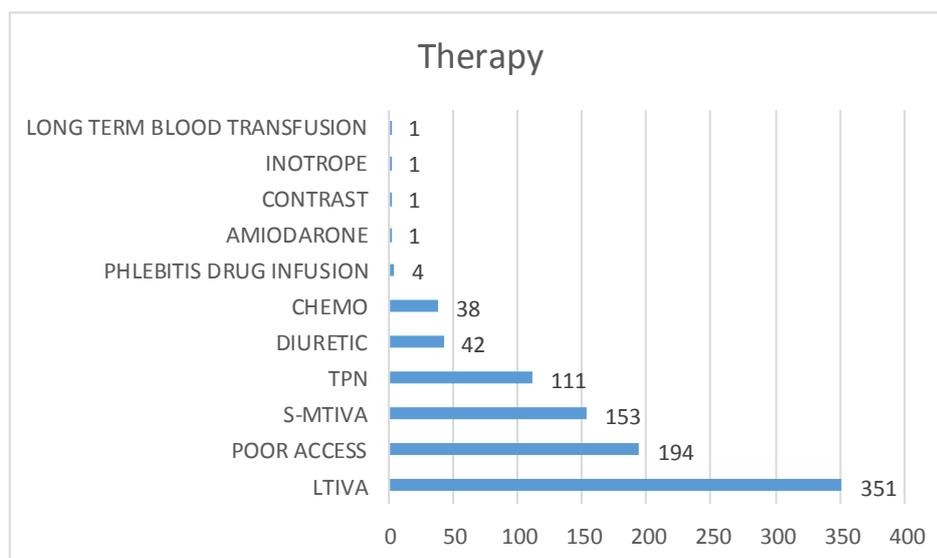
However, with the increasing demand on the service, line insertion is prioritised based on the following clinical considerations:

- Patient is prescribed chemotherapy

- Patient is prescribed TPN
- Patient has poor peripheral access/no peripheral access and requires stabilisation of haemodynamic (e.g. furosemide, amiodarone)
- Clinical condition of patient - given by medical team
- Time patient on referral list

Reason for line:

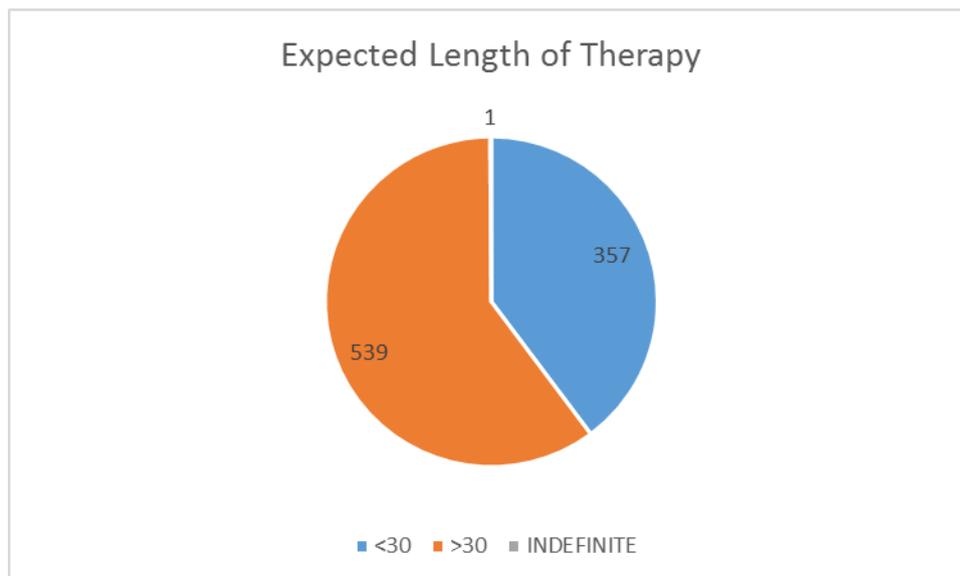
PICCs required for central IV access include IV therapy such as TPN, some antibiotics, chemotherapy and IV drugs required to be administered via a central line. Other short to medium term therapies include antibiotic therapy, peripheral TPN and other IV infusions and drugs required for longer than 7 days. The following charts categorise reasons PICCs and midlines are inserted.



39% or 351 of the lines inserted were for long term IV antibiotics (LTIVA). This caters mostly for the out-patient antibiotic therapy (OPAT) patients. Total parenteral nutrition (TPN), chemotherapy and short-medium term antibiotic therapy (S-MTIVA) accounts for 51% of the lines inserted. 197 lines were inserted for patients with poor access.

As mentioned above, majority of the lines were inserted for long term antibiotic (LTIVA) therapy. These in particular were for patients with bronchiectasis, osteomyelitis, infected metal works, etc. TPN were indicated for patients with GI diseases and surgery. On top of the list for reasons for IV device were hematologic diagnosis and diabetic foot ulcers.

Expected length of therapy:



Therapy duration ranged from less than 7 days to more than 4 weeks. Over 500 lines were inserted for therapies more than 30 days.

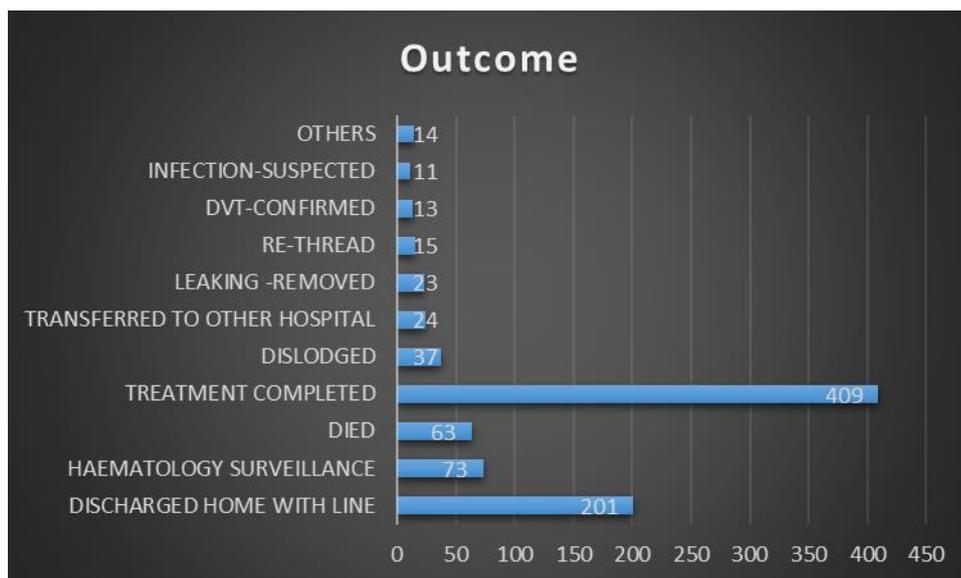
Indwell time:

Total no. of lines 2015-2016	897
No. of catheter days	11646
Mean no. days in situ	13 days

Total no. of lines 2014-2016	701
No. of catheter days	9,389
Mean no. days in situ	13.4 days

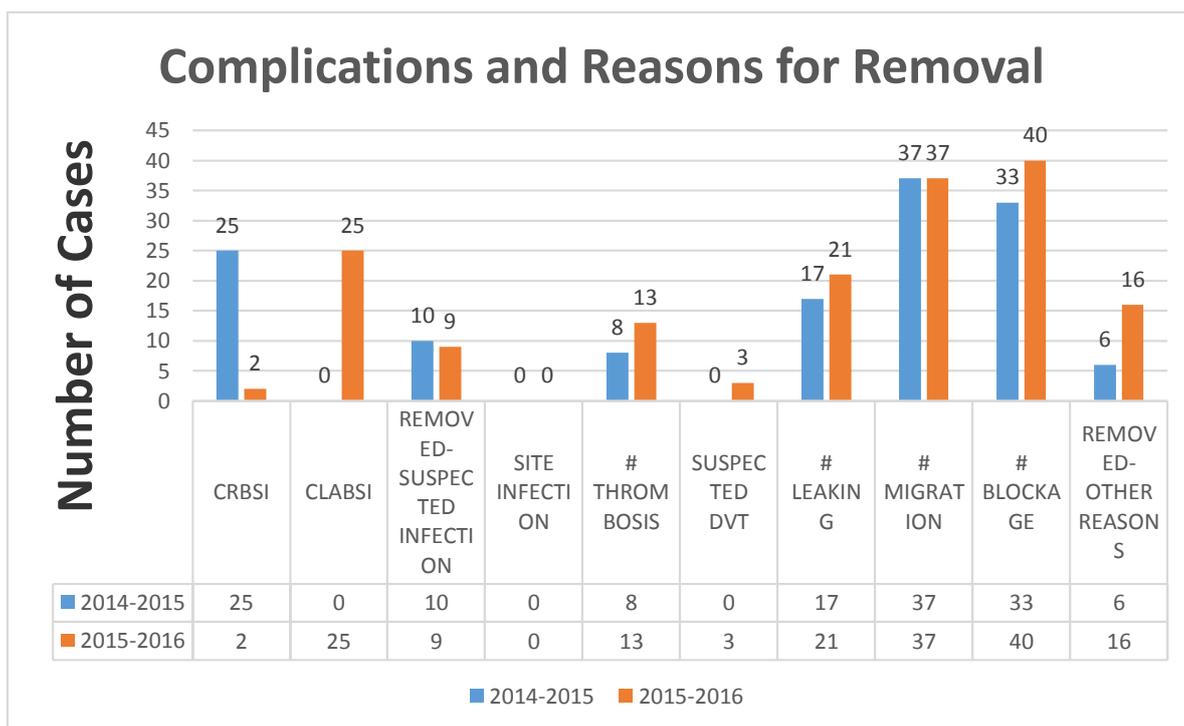
Catheter dwell times ranged from 1 day up to 93 days. Under 12,000 catheter days were accumulated by the Trust for the year, 19% more compared to last year.

Outcome of lines:



784 or 87.4% of the lines inserted had a positive outcome. Either they were removed after the treatment was completed, discharged home with midline and discharged with a PICC or transferred to a different institution. The remaining 113 or 12.6% of the lines were removed because of either complications or other reasons i.e. patient dying during the surveillance period or patient self-discharging.

Complications:



Complications of IV devices does not necessarily mean removal. If an IV device becomes occluded, then the aim is to resolve the occlusion before considering removal. IV devices are not usually removed when a line infection is suspected, unless it is clinically indicated to do so. Many patients that require PICCs and midlines will already have poor peripheral access and so the line is not removed until blood culture results confirm line related infection. Thrombosis of the line is confirmed following an ultrasound scan of the upperarm. This usually results in removal of the line.

Complication rate:

	Apr 2015 – Mar 2016
No. lines inserted	897
No. of complications	163
No. of catheter days	11646
Complication rate	14 per 1000 catheter days

	Apr 2014 – Mar 2015
No. lines inserted	701
No. of complications	136
No. of catheter days	9389
Complication rate	16.6 per 1000 catheter days

Overall, the complication rate has not significantly decreased. This can be due to the lack of staff training on how to manage vascular access devices appropriately.

Objective: To standardise the processes involved in the insertion, care and ongoing management of vascular access devices

To standardise the processes involved in the insertion and care of all IV access devices, the following documents have been drafted and CG approved to standardise the processes involved in the insertion, care and ongoing management of vascular access devices.

- ✓ CVAD SOP
- ✓ CVAD Clinical Guidelines
- ✓ PICC and Midline SOP
- ✓ CVAD selection algorithm
- ✓ CVAD documentation
- ✓ Tunnelled CVAD, PICC & Midline Passports
- ✓ Competency assessment for CVAD dressing change, removal and blood sampling

All CVADs inserted in dedicated procedure rooms apart from lines inserted in AED, ICU and wards where patient are unstable to come to clinic for the procedure. All CVADs in the Trust are now inserted using ultrasound guidance with maximal barrier precautions according to NICE guidelines.

A Trust-wide IV Steering Group has been established. The initial work of the group is to at a wider aspect of IV issues and improve the standards of IV management to reduce IV related infections and other complications.

Goal No.	Goal	Goal Alignment with Annual Plan
2	To monitor and reduce the risk of infection related to vascular access devices.	Care that is safe.

Objectives:

- *To support the Corporate Infection Prevention and HCAI Reduction Delivery Plan 2014/15 mainly to reduce IV related HCAs by April 2015*
- *To monitor any line related infection/complications inserted by the IV Team*
- *To ensure the system of audits for IV management and insertion provides reliable audit data reflecting actual practice*

Evaluation:

Objective: To support the Corporate Infection Prevention and HCAI Reduction Delivery Plan 2014/15 mainly to reduce IV related HCAs by April 2015

In the last year, a robust database and processing of surveillance, reviews and audits of IV related practices was established. Recording of complications in the database was continued. Furthermore, root cause analysis (RCA) of CVAD related infection was commenced.

Although the Team aimed for a quarterly ANTT and IV Management audits across the organization, workload has not allowed this to happen. Only 2 audits took place in the year 2015-16. In addition, a point prevalence audit (PPA) to ascertain appropriateness of patients'

IV access device, vessel health, etc. was performed and baseline data of Trusts' demand for IV access is now in place.

To help support the Trust's goal to reduce hospital MSSA bacteraemia by 50%, the following actions has been implemented:

- ✓ All complications and infections recorded in database
- ✓ All RCA meetings are attended to

MRSA Bacteraemia

Period	Trust Apportioned MRSA Bacteraemia Cases	IV Device related MRSA Bacteraemia Cases
2013-2014		No data
2014-2015	3	3
2015-2016	1	1

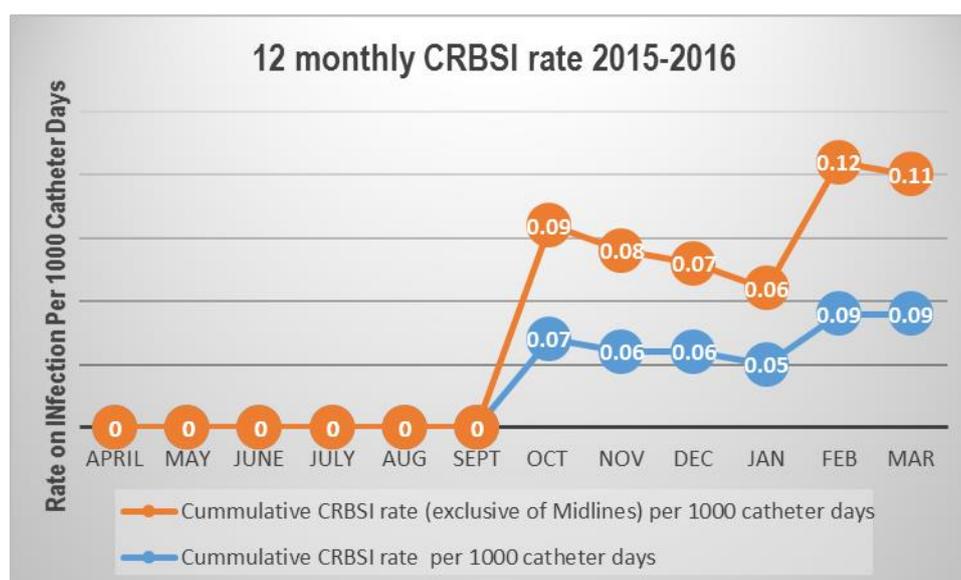
The target of zero avoidable MRSA bacteraemia was not achieved with one IV related MRSA bacteraemia.

MSSA Bacteraemia

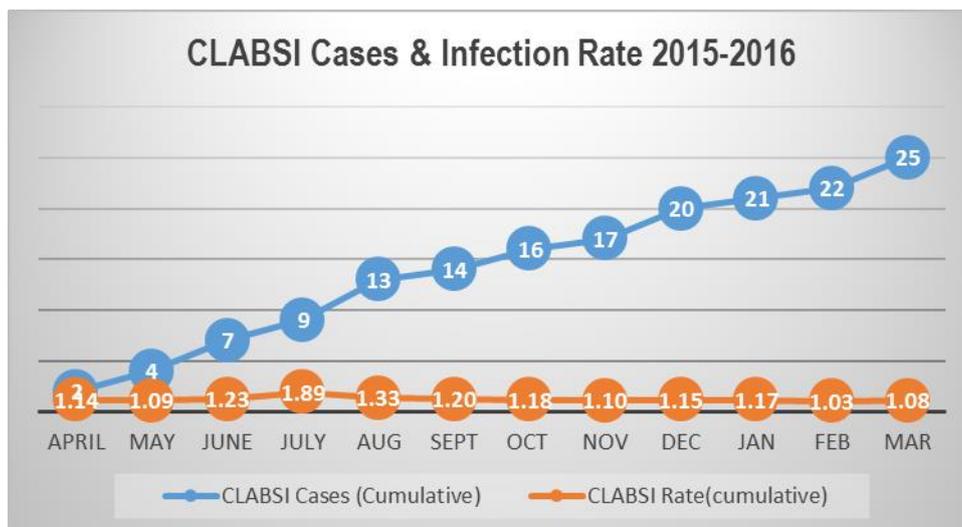
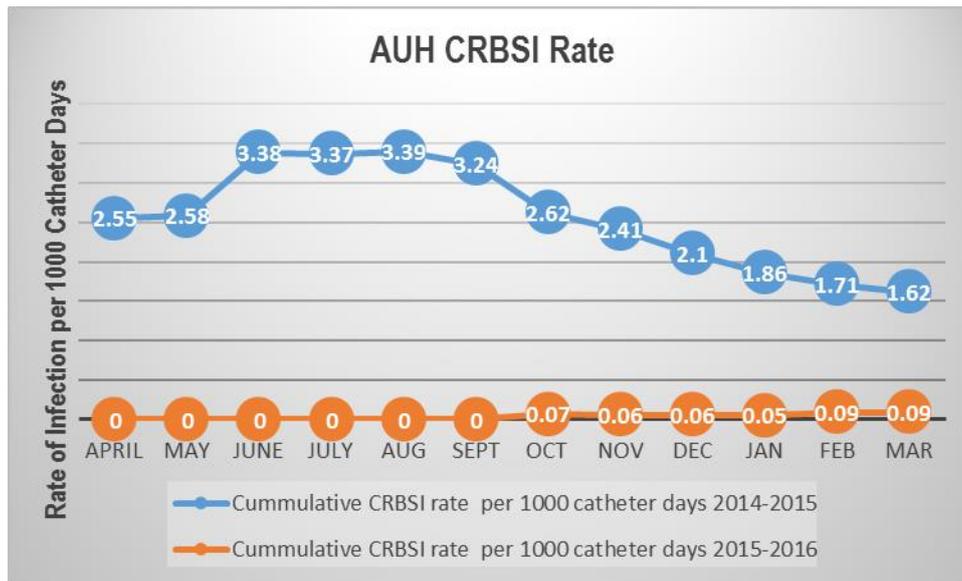
Period	Trust Apportioned MSSA Bacteraemia Cases	IV Device related MSSA Bacteraemia Cases
2013-2014		No data
2014-2015	18	10
2015-2016	25	14

A target of 30% reduction of MSSA bacteraemia set. However, failure to achieve this occurred with 25 cases of bacteraemia and 14 of these are likely to be related to IV access devices.

CRBSI Rate per 1000 Catheter Days

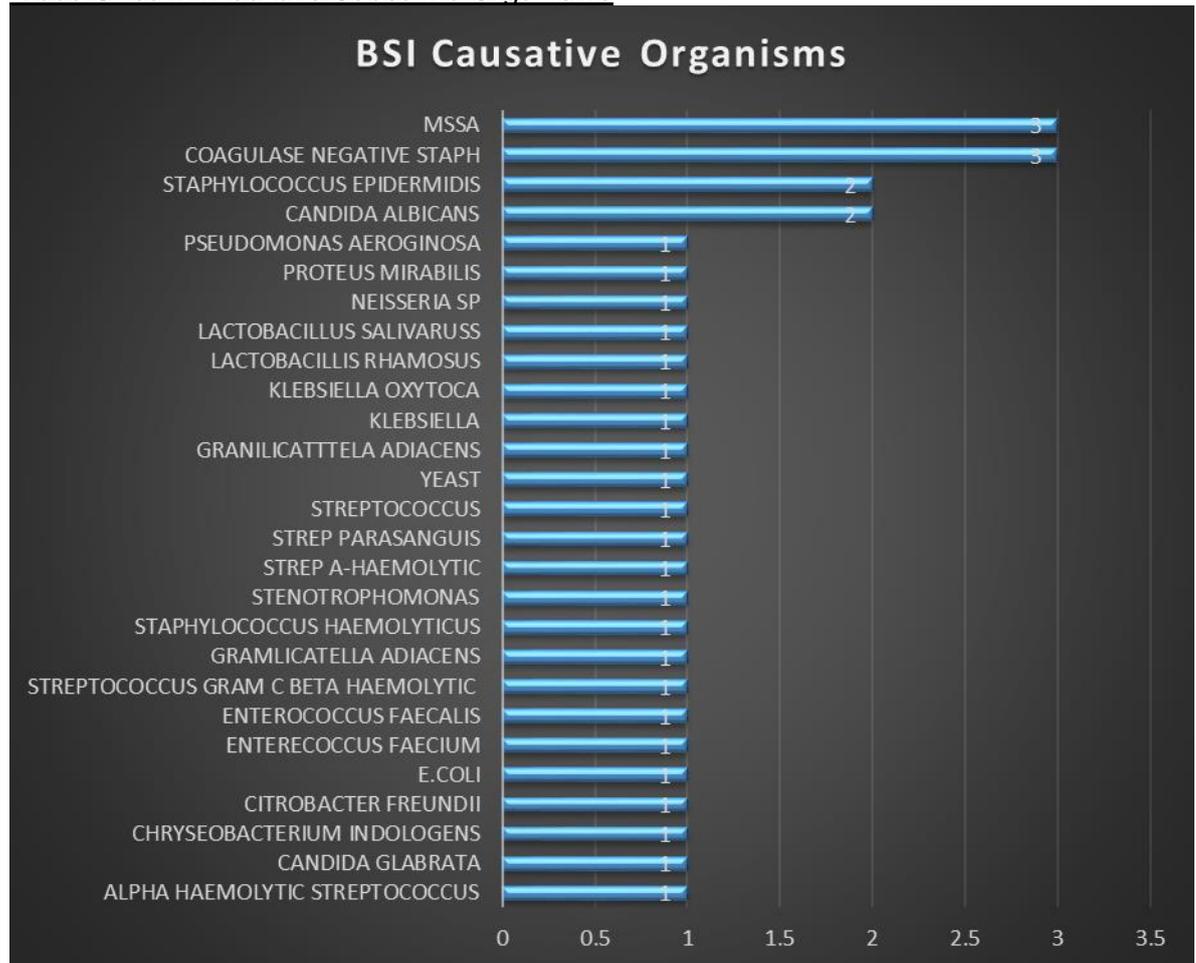


Recent data from NNIS from January 1992 through June 2004 showed the median rate of CRBSI in ICUs of all types ranged from 1.8-5.2 per 1000 catheter.¹



Regular attendance of the IV Team in the Trust Microbiology Handover was ensured. This allowed monitoring of cases related to CVAD.

Blood Stream Infections Causative Organisms



Robust surveillance identified wards that had high prevalence of infections and allowed the team to provide support in terms of management of IV devices, infection prevention in particular.

2015-2016 CRBSI-CLABSI Heat Map

WARDS	DIVISIO N	AP R	MA Y	JU N	JU L	AU G	SE P	OC T	NO V	DE C	JA N	FE B	MA R	TOTA L
AED	MEDICI NE													
MAU	MEDICI NE													
CCU	MEDICI NE													
ICU	SURGE RY							1						3
1	SURGE RY										1			1
2	SURGE RY									1				1
3	SURGE RY			1	1									2
4	SURGE RY					1								1
8	MEDICI NE													
9	MEDICI NE													
10	SURGE RY					1	1	1						3
11	SURGE RY		1		1									2
15	MEDICI NE									1				1
16	SURGE RY													
17	SURGE RY													
19	MEDICI NE					1								1
20	MEDICI NE													
21	MEDICI NE											1	1	2
22	MEDICI NE													
23	MEDICI NE													
24	MEDICI NE	2	1	2		1				2				8
25	MEDICI NE													
28	SURGE RY													
29	SURGE RY													
	TOTAL	2	2	3	2	4	1	2	1	3	1	1	3	25
LEGEND	CRBSI	0	0	0	0	0	0	1	0	0	0	1	0	2
	CLABSI	2	2	3	2	4	1	1	1	3	1	0	3	23
BAXTER												1		
BUPA											1			
OTHERS/ COMMUNI TY												1		

2014-2015 CRBSI Heat Map

WARD S	DIVISION	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	TOTAL
AED	MEDICINE													
MAU	MEDICINE													
CCU	MEDICINE													
ICU	SURGERY		2	2		1				1				6
1	SURGERY													
2	SURGERY													
3	SURGERY	1			1									2
4	SURGERY													
8	MEDICINE				2									2
9	MEDICINE													
10	SURGERY	1		1	1	1	1					1		6
11	SURGERY					1								1
16	SURGERY													
17	SURGERY													
19	MEDICINE													
20	MEDICINE													
21	MEDICINE				1									1
22	MEDICINE		1	1										2
23	MEDICINE													
24	MEDICINE					1	2		2					5
25	MEDICINE													
28	SURGERY													
29	SURGERY													
30	MEDICINE													
31	MEDICINE													
32	MEDICINE													
33	MEDICINE													
34	MEDICINE													
LEGEND	CRBSI	2	3	4	5	4	3	0	2	1	0	1	0	25
	CLABSI													

Goal No.	Goal	Goal Alignment with Annual Plan
3	To monitor and reduce the risk of infection related to Vascular Access Devices	Care that provides a positive experience for patients and their families

Objectives:

- *To support the Trust vision in providing world-class service for all patients with an IV device:*
- *IV Team to ensure appropriate review of all central venous catheters (CVCs) on all general wards (i.e. patients transferred with CVCs from another Trust, step down from critical care, inserted by IV Team)*
- *To review IV related documents on regular basis or whenever new evidence warrants review sooner.*

Evaluation:

Objective: *To support the Trust vision in providing world-class service for all patients with an IV device:*

- Information leaflets published
- IVAD passport developed

Objective: *IV Team to ensure appropriate review of all central venous catheters (CVCs) on all general wards (i.e. patients transferred with CVCs from another Trust, step down from critical care, inserted by IV Team)*

- 100% IV devices placed by IV team reviewed at least once a per week

Number of review episodes	2,423
Time spent on reviews	43,484 mins/724hrs/96days/18mins per patient
Staff training 1-1	152
Troubleshooting	149
Dressing change	489

Objective: *To review IV related documents on regular basis or whenever new evidence warrants review sooner.*

- IV related documents are in line with national guidelines.

Goal No.	Goal	Goal Alignment with Annual Plan
4	Pursuing quality improvement in IV Access provision.	Care that is safe.

Objectives:

- *Service development – Dressing / NFD / PICC & Midline Review*
- *Implementation of a Vascular Access Positioning System*
- *Support the Trust in implementing the EU directive 2010/32/EU on preventing sharp injuries in the hospital and healthcare sector by representing the IV Team at the Trust Sharp Group*

Evaluation:

Objective: *Service development – Dressing / NFD / PICC & Midline Review*

- Curoc caps (alcohol impregnated caps) and CHG dressings implementation for all central venous access devices. These adjuncts played a huge role in the reduction of catheter related blood stream infections

Objective: *Implementation of a Vascular Access Positioning System*

- Implementation of the Nautilus machine (ECG Tip Confirmation System). 373 PICC tips has been confirmed using the system. This significant number equates to significant decrease in the use of chest x-ray. With the cost of x-ray set at £ £45.00 an £16,785.00 savings has been estimated with the use of the VPS system.

Other Activities

Out-patient Activities

Number of out-patients Episodes	62
Number of troubleshooting episodes	26
Number of insertions	36
Number of hours spent on out-patient activity	5,045 minutes

- Out-patients' day case template has been established and the Trust now receives income for these activities.

Goal No.	Goal	Goal Alignment with Annual Plan
5	To reduce harm across the organisation in relation to VAD related HCAs.	Care that is safe and clinically effective.

Objective:

- *Sustain provision of training and education, relating to IV management, to all staff group within the Trust*
- *Establish an IV Link nurse group and provide training and development.*

Evaluation:

Objective: *Sustain provision of training and education, relating to IV management, to all staff group within the Trust*

The team was involved in the following trainings:

- ANTT training
- IV Study Day (full day and half day)
- CVAD Management
- High dependency skills workshop
- Ward based teaching
- Doctors' induction

Training	Number of Staff Trained
IV Study Day	143
CVAD Management	197
HDSW	60
Doctors Training	50
ANTT	

Objective: *Establish an IV Link nurse group and provide training and development.*

The IV Link meetings run quarterly. The role of the IV link includes cascading new information regarding IV practices, devices and policies. IV links are expected to support their line manager in IV related training and annual assessments are up to date for their clinical area and that correct procedures adhered to when undertaking any IV procedure.

- 100% of wards will have an identified link nurse
- IV Link nurses and IV resource file created and made available to the wards
- Meetings arranged and presented

4. Future developments

- Implementation of VHP Framework trust-wide
- Build a novel approach to dealing with CLABSI cases i.e. post incident investigation and review
- Trial of a different midline brand

5. Additional Achievements

- Abstract and Poster Presentation: Ventura, O'Loughlin and Vavrik (2016) Passive disinfection port protector: effect on reduction of catheter-related bloodstream infection. WoCoVA 2016, Lisbon, Portugal.
- CO presented at the National IPS IV Forum in Sheffield on November 2015 on the topic of VHP Implementation.

- RV presented at various Regional IV Forums in June, August 2015 and on Dec 2015 at the GAVECELT (Gli Accessi Venosi Centrali a Lungo Termine) in Milan, Italy on 'Passive disinfection port protectors and suture less securement device'.

7. Implications

Financial

No financial implications

Workforce

No workforce implications.

Other

None.

8. Recommendation

The Infection Prevention and Control Group is asked to note the report.

9. References and further reading

National Nosocomial Infections Surveillance (NNIS) System Report. Am J Infect Control. 2004; 32:470–85.

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