



# Reducing Peripherally Inserted Central Catheter occlusion in in-patient clinical areas

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## Background

- Team leaders observed an increasing trend in Peripherally Inserted Central Catheter (PICC) occlusions in 2013 and decided to form a team to look for potential solutions.
- Review of 6-months clinical data from Department of Diagnostic Radiology (DDR) showed that PICC occlusion is the most common PICC related complication in the in-patient clinical area.
- The team decided to implement evidence-based interventions to reduce PICC occlusion.

## Method

The team implemented the following:

- Standard Work Instruction
- PICC Post-Insertion Instruction Form
- “Push-Pause” technique in flushing of PICC
- “Positive Pressure Disconnection” technique before clamping the catheter
- A close needleless system neutral pressure connector to replace universal closing stopper
- Training provided to 6 piloted wards before hospital wide implementation

## Results

Duration	6-months baseline Oct 13-Mar 14	1 <sup>st</sup> 6-months Aug 14-Jan 15	2 <sup>nd</sup> 6-months Feb 15-Jul 15
No. of PICC insertion	194	204	194
No. of PICC occlusion	34 (17.5%)	11 (5.4%)	5 (2.5%)
<b>No. of PICC prevented from occlusion</b>	<b>0</b>	<b>23</b>	<b>29</b>
1 hour/procedure		n = 23	n = 29
Procedure time saved from preventing occlusion	0	23hour	29hour
Procedure time saved from preventing re-insertion	0	23hour	29hour
<b>Total procedure time saved in 12 months: 46 + 58 = 104 hours</b>			

Table 1: PICC insertion, occlusion incidence and procedure time saved

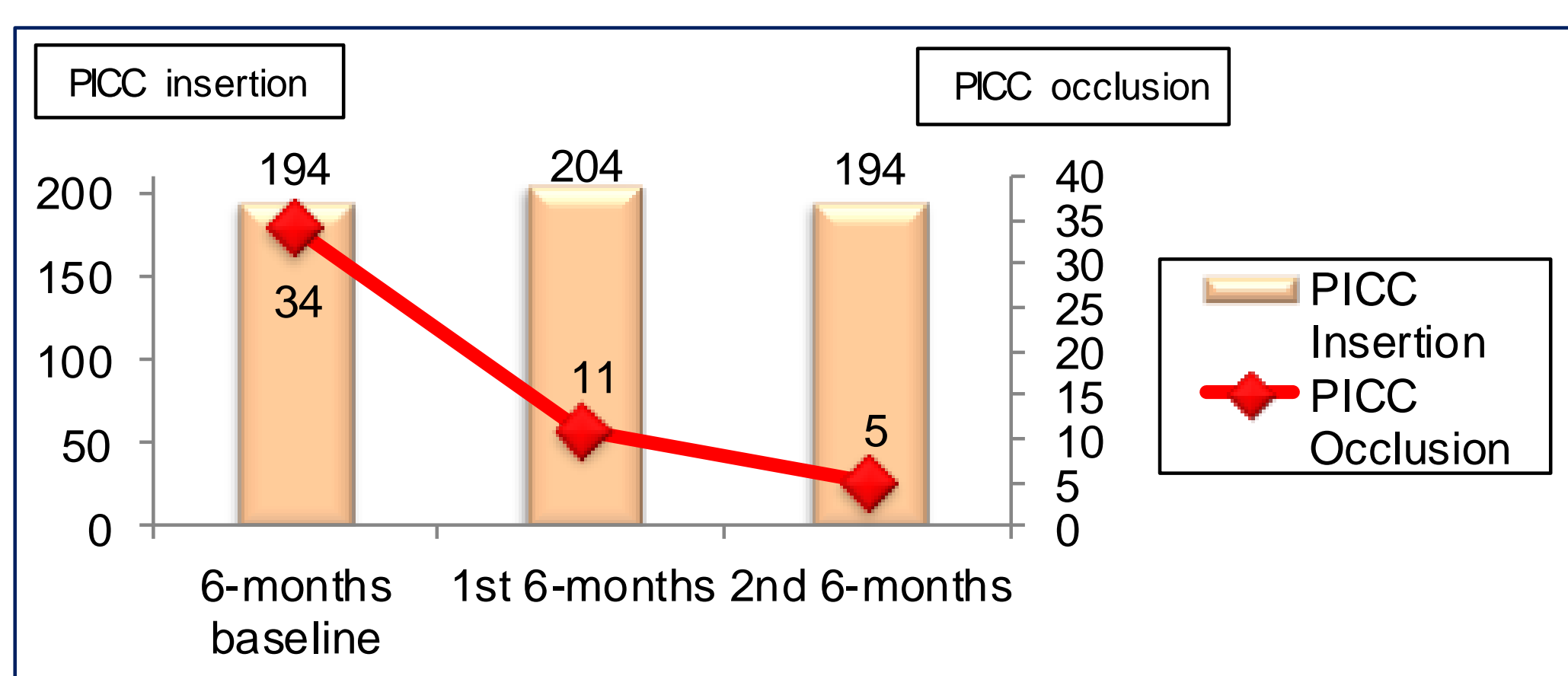


Figure 1: PICC insertion and occlusion incidence

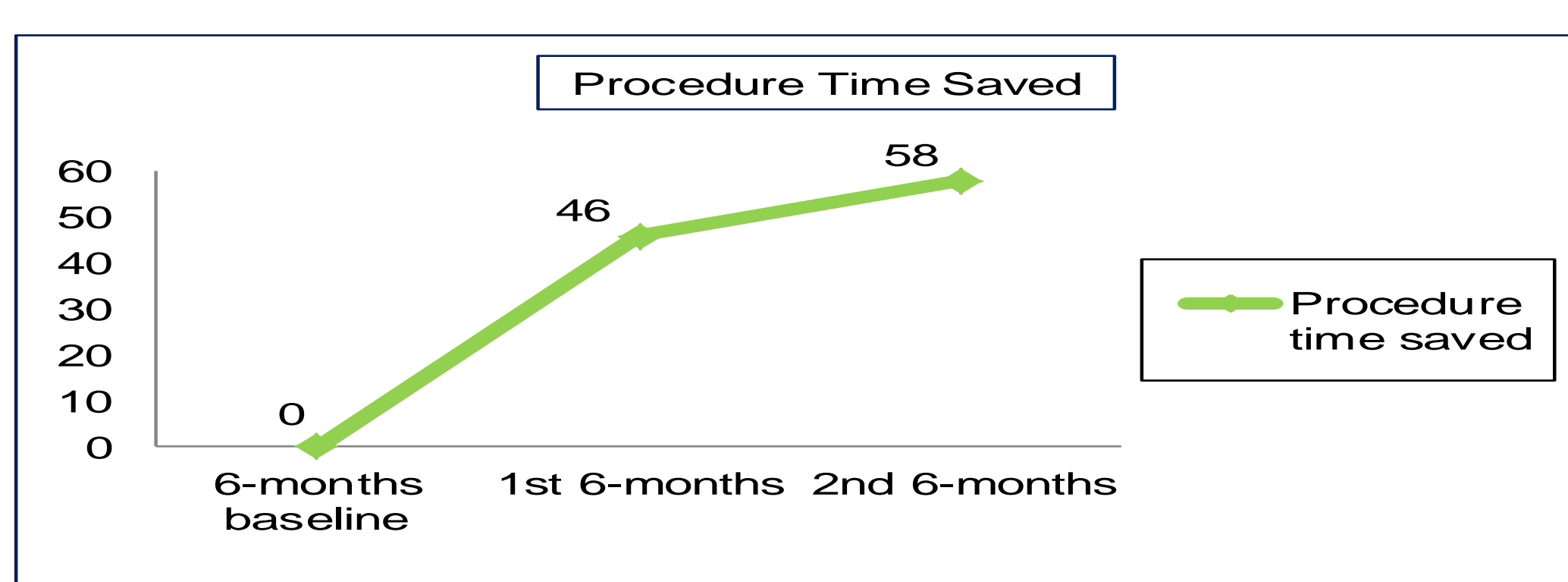


Figure 2: Procedure time saved

Duration	6-months baseline Oct 13-Mar 14	1 <sup>st</sup> 6-months Aug 14-Jan 15	2 <sup>nd</sup> 6-months Feb 15-Jul 15
No. of PICC insertion	194	204	194
No. of PICC occlusion	34 (17.5%)	11 (5.4%)	5 (2.5%)
<b>No. of PICC prevented from occlusion</b>	<b>0</b>	<b>23</b>	<b>29</b>
\$600/PICC		n = 23	n = 29
Procedure cost saved from preventing occlusion	0	\$13,800	\$17,400
Procedure cost saved from preventing re-insertion	0	\$13,800	\$17,400
<b>Total procedure cost saved in 12 months: \$27,600 + \$34,800 = \$62,400</b>			
\$266.70/procedure		n = 23	n = 29
DDR manpower cost from preventing occlusion	0	\$6,134	\$7,734
DDR manpower cost from preventing re-insertion	0	\$6,134	\$7,734
<b>Total DDR manpower cost saved in 12 months: \$12,268 + \$15,468 = \$27,736</b>			
\$6.60/PICC		n = 204	n = 194
Connector cost saved	0	\$1,346.40	\$1,280.40
<b>Total connector cost saved in 12 months: \$1,346.40 + \$1,280.40 = \$2,626.80</b>			

Table 2: Procedure cost, DDR manpower cost, and connector cost saved

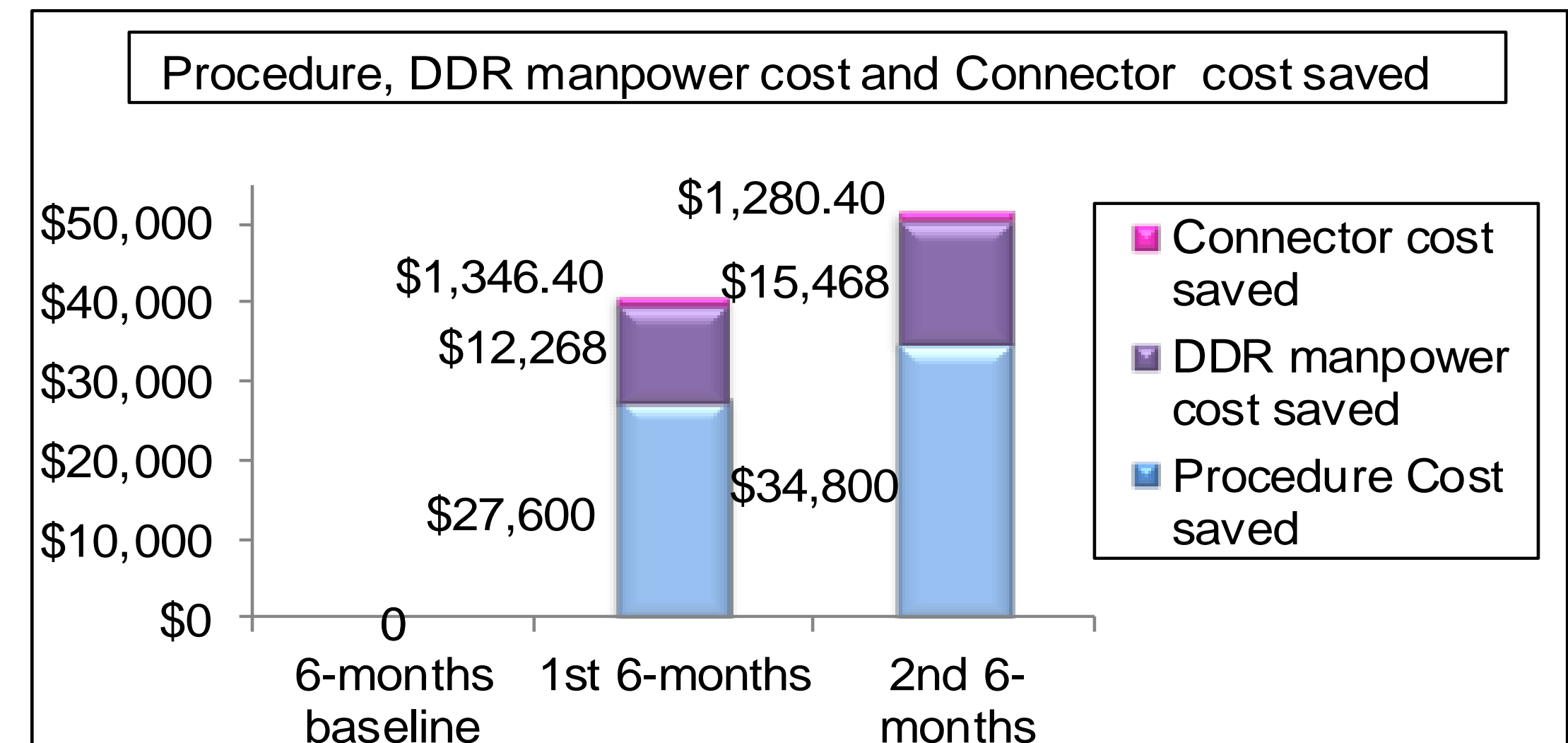


Figure 3: Procedure, DDR manpower cost and connector cost saved

## Conclusion

- The percentage of PICC occlusion decreased from 17.5% to 5.4% and 2.5% during the first and second 6-months respectively. This suggests the sustainability of the implemented interventions.
- 12-months follow-up showed that the project saved 104 hours procedure time. Total amount saved was \$92,762.80 which includes \$62,400 for procedure cost, \$27,736 for DDR manpower cost and \$2,626.80 for connector cost.

## Project Impact

This project provided better, safer, cheaper and faster care to our patients by eliminating:

- patient’s experience of pain and stress induced by PICC re-insertion
- risks associated with re-insertion procedure
- interruption of intended therapeutic treatment
- the potential for extended length of stay due to interruption of treatment

In addition, the time and manpower saved allowed staff from inpatient areas and DDR to attend to other services.