World Quality Month
2020 Celebration

F-PRIME –Preventing Risk of Infections and Medication errors in IV therapy

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TEAM EXCELLENCE AWARDS
FOR CQI BREAKTHROUGHS
QualTech PRIZE 2020 HEALTHCARE
28-29 November

Fortis Hospital Mohali

F-PRIME –Preventing Risk of Infections and Medication errors in IV therapy

August 2019-Jan 2020

INTRODUCTION

Preventing Risk of Infections and Medication errors in IV therapy

Preventable harm to patients is a goal to which all healthcare professionals should be committed.

- Administration of medications via invasive routes presents itself with unique risks. Intravenous (IV) medications are associated with **54% of potential adverse drug events, according to Kaushal et al2.**
- Taxis and Barber performed a study in 10 wards in the UK and found that errors in preparation and administration occurred in 49% of doses

- **Infections risk in peripheral and central lines due to** contamination of the line during insertion ,manipulation and not removing lines in a timely manner.
- One of the more common risks of medication or fluids administered by peripheral or central lines is the potential for infections. There are **high morbidity and mortality rates for central line associated bloodstream infections**.

Enhanced knowledge of standards and policies, as well as higher compliance to techniques and technology shall help minimize errors and prevent occurrences of unwanted outcomes.

PROBLEM DEFINITION

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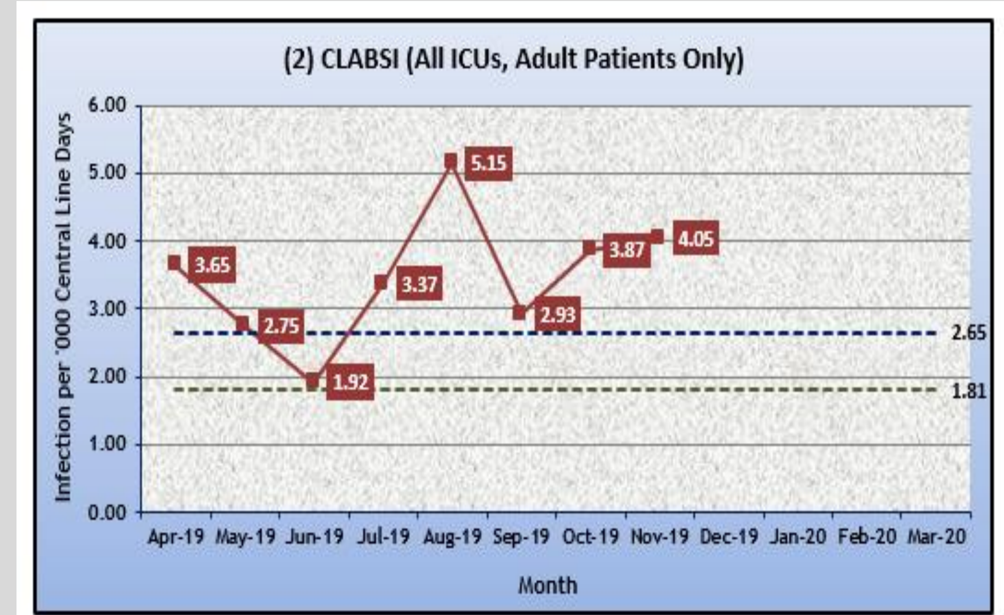
Intravenous (IV) medications are associated with potential adverse drug events and rate of error in the preparation and administration of IV medications at the bedside is surprisingly high.

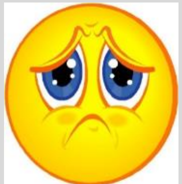
- Medication error rate 4.25 in Q2 FY 2019-20

Medication/fluids administered by peripheral or central lines is the potential for infections.

- CLABSI rate 4.1 in Q2 FY 2019-20



Parameters	Pan Fortis Benchmark	Upper Control Limit	Lower Control Limit	Q1	Q2
Infection Control Parameters					
CLABSI per 1000 central line days	1.81	2.65	0.96	2.77	4.1(14)
Medication Errors					
Total Medication Errors per 1000 patient days	2.75	7.53	0.00	4.19	4.25(106)



PROBLEM DIAGNOSIS

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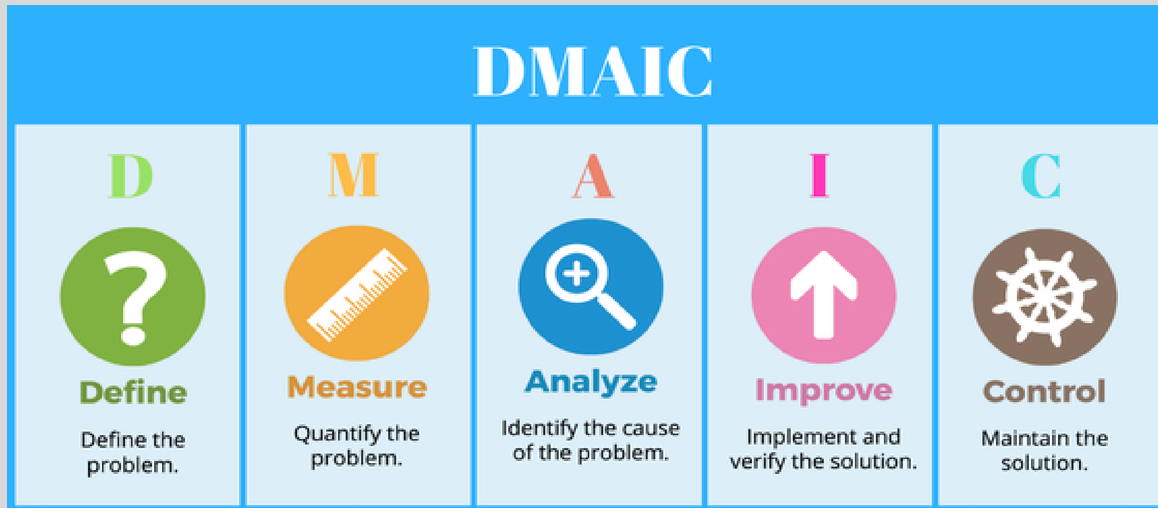
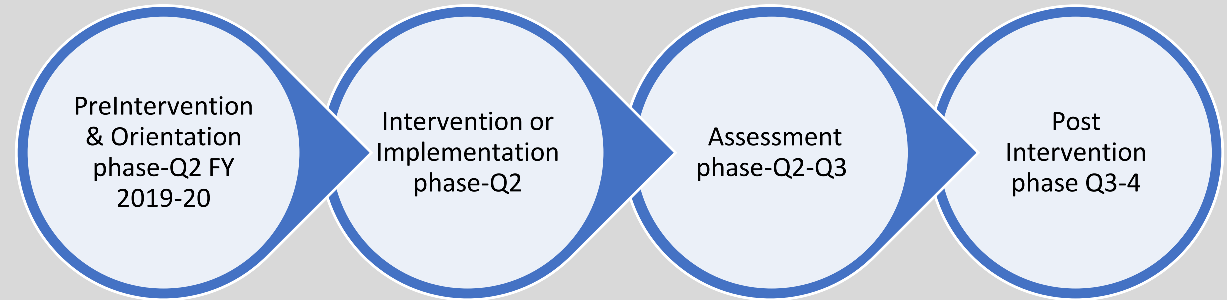
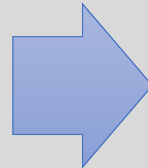




Specific task group were assigned to audit & interview the staff nurses using

PRIME Audit toolkit to review

1. Medication Preparation
2. Initiation of therapy
3. Medication administration
4. Maintenance of vascular lines
5. Surveillance of HAI's and Incidence reporting



Following gaps were found during initial audit w.r.t

1. **Medication errors** noted in Drug calculation in IV therapy
2. Medication preparation -**Prescription appropriateness review** not as per the policy /JCI standards
3. Placement and Maintenance of **Vascular Access Devices** inadequate or care bundle compromised

Project Team of PRIME leaders and champions formulated for this quality improvement (QI) initiative.

PROBLEM DIAGNOSIS-Structured checklist designed

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	AUDIT TOOL for F-PRIME		
	1. Medication Preparation and Administration		
	a. Identify 4 nurses (ideally from 4 different units) who prepare medications on the ward		
i.	**Interview each nurse and ask:**		**Nurse 1**
1	The type of review or investigation they perform to ensure that the medication to be prepared is correct (they should mention the 5 Rights. Investigate how the medication must be prepared to deliver the prescribed dose; the review of the prescription for appropriateness and to identify any errors with the prescription)	Proper Review	
2	Discuss when a medication label must be applied to the dosage unit prepared by the nurse. What information must be on the label? - medication name, - dose/concentration, - date prepared, - expiration date/time of the preparation, - patient's name and - a 2nd identifier for the patient)	Labeling	
3	Ask when hand washing should be performed rather than using hand gel. - for visibly soiled hands; - when prepared an IV admixture where a drug is admixed in an infusion bag; - when a patient has any form of infectious diarrhea	Hand gel	
ii.	**Observe 4 nurses who are preparing medication**		**Nurse 1**
1	Demonstrate proper technique for removing drug from an ampule; - placing a cotton swab around the neck and breaking away from the face; - using a filter needle in one direction and then - switching to a regular needle to push the drug out; - not using the ampule remaining contents for any other doses Demonstrate proper technique for removing drug from an vial; - swabbing the rubber stopper with alcohol and allowing it to dry; - entering vial through rubber stopper at a 45 degree angle with the sharp point first; - if reconstituting powder, - using 'push-pull' method of introducing liquid into the vial and capturing air that has been displaced	Drug Removal	
2	Observe hand hygiene is properly performed	Hand Hygiene	
3	Observe where medications are prepared (area should be clean, uncluttered and free from distractions)	Med Prep Area	
4	How do they know whether 2 (or more) drugs are safe to mix together? - consult drug information references or other resources; I - f not sure, avoid contact by not mixing together or flushing the line with saline prior to adding another drug	Drug incompatiblities	
5	Observe how are they calculating the proper amount of drug to prepare	Calculations	
	b. Are there any nurses who will be preparing or administering hazardous drugs? If this is a hospital which administers chemotherapy, 3 nurses from wards where chemotherapy is prepared or administered should be observed as they prepare or administer chemotherapy for:		**Nurse 1**
1	Proper use of PPE - 2 pairs of chemo gloves, - a gown with a plasticized fabric; - and if splashing is a possibility, goggles and a respirator	Use of PPE-Hazard Drug	
2	Correct disposal (in hazardous waste receptacle)	Correct disposal Hazard Drug	
3	Proper technique or equipment use to prevent exposure - correct use of Closed System Transfer Devices, if the organization uses; - if CSTDs are not used, use of chemotherapy pins, or negative pressure aseptic technique to prevent sprays of chemotherapy during compounding; - compounding of chemotherapy in a biologic safety cabinet; - priming with the tubing filled with plain solution before the chemotherapy is added to the IV infusion bag	Prorper Technique/Equipment	

	2. Placement and Maintenance of Vascular Access Devices(VADs)		
	a. Have the hospital identify 4 nurses who've placed venous access devices in the last day or two, and go to the patient and evaluate the following:		**Nurse 1**
1	Correct gauge of catheter? - based on age, - fragile veins- 22 or 24 G for frail, elderly, pediatric, infants; - 18-20 G for adults - blood product- 18, 20 G	Correct gauge of catheter	
2	Correct location of insertion - avoid bendable, - flexible places in frail, elderly, infants - avoid compromised extremities (any injury or wound on an extremity; mastectomy-extremity)	Location of insertion	
3	Sel...	Selection of	
2	Question nurses about how they raise concerns about prescriptions with the physician?	Clarify drug orders	

Medication Preparation & Administration of drugs
-prescription Review
-Hazardous drugs including Chemotherapy
-Labelling of drug
-Removing the drug from vial
-Drug calculations
-Hygiene maintenance

Placement and maintenance of VAD
-Selection of site
Selection of correct guage of catheter
Correct steps in care
IM Inj-Z technique
SC Inj-Rotation of site
Knowledge of CVAD & complication
Med Error device infection reporting

PROBLEM REMEDY

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Preventing **R**isks of **I**nfections & **M**edication **E**rrors in IV Therapy

FHM Implemented a Quality Improvement initiative- Preventing risks with IV Therapy and Medication Errors ("F-PRIME"), in partnership with Joint Commission International (JCI).& Becton Dickinson India Private Limited

PRIME Program Contents

Medication Preparation
Environment, risks, contamination of IV preparations, HD safety, Closed system drug transfer devices, etc.,

Medication administration
Bolus, drug-drug interactions, calculations and dosing errors, bolus injections, syringe and infusion pumps, flushing, etc.,

Surveillance of HAI's and Incidence reporting
Med. errors, sharps injuries, Haz. drugs exposure, local IV Complications, CrBSI, PLABSI, etc.,

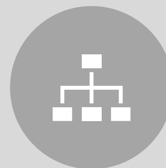
Initiation of therapy
Right device, Site selection, Skin prep., Insertion, Dressings, Stabilization, etc.,

Maintenance of vascular lines
Dressing change, flushing, removal, etc.

- Hospital Enrollment
- Identify 3-5 leaders
- Nominate Implementation Team (~25)
- Training of Implementation Team

Months	01	02	03	04	05	06
Self-Assessment						
Tele-Consultation						
Educational Webinars						
Evaluation						
Recognition						

Multipronged strategy of creating awareness, education, implementation at bedside, Leveraging JCI's expertise



Assessments of process compliance through **change agents** using a structure evaluation tool.

Building staff proficiency by organizing Monthly updates through **webinars and consultative sessions with JCI experts** to focus on potential errors/gaps within each category and skills of staff.

Brainstorming session for further discussion and improvements areas

PROBLEM REMEDY

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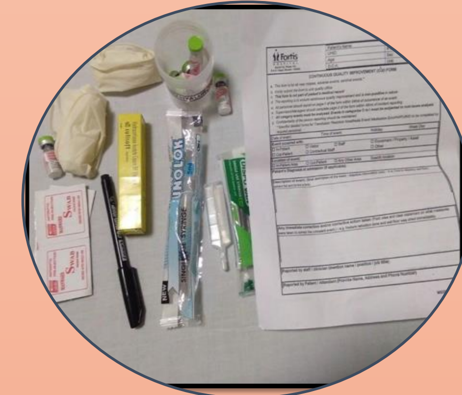
Non compliances identified during initial audit were addressed by following Interventions/Potential solutions

1. **Drug calculation errors** were addressed by assigning dedicated Clinical pharmacists in the area to look for potential errors especially. Start of DIC (**Drug Information centre**)

2. Medication preparation was modified in one of medical ICU ,creating a **Special Medication Preparation bay** for preparing Infusion therapies by specially trained staff under Clinical Pharmacists supervision



3. Placement and Maintenance of **Vascular Access Devices** by Reinforcement of training amongst the staff as well as Creating **Peer support group-**i.e. daily supervision and handholding by ICNs/In charge /change agents

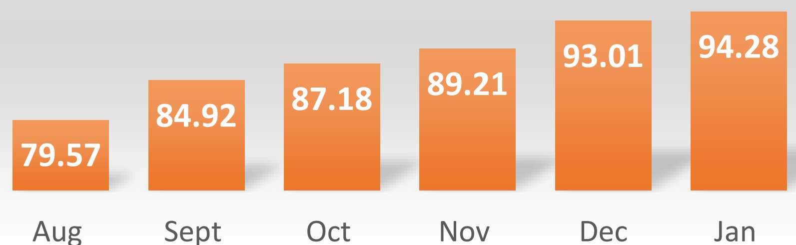
LOCKING THE IMPROVEMENT

During this initiative our process compliance score increased from 79.57% to 94.28% compliance by end of six months of implementation .

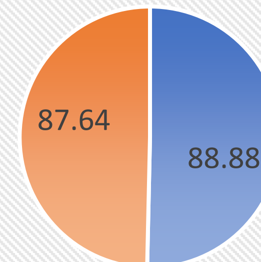
Reduction in CLABSI rates and Medication errors significantly over the period .

Average Process compliance

Average Process compliance



Avg compliance



1. Medication Preparation and Administration
2. Placement and Maintenance of Vascular Access Devices(VADs)

CLONING THE IMPROVEMENT

As approved by hospital Management ,The **Medication Bay** initiative was undertaken to be replicated in other critical care areas(GICU) /specialty wards .

The Project also resulted in formulating and implementing **Standard operating procedures w.r.t Infusion Nurses society (INS) standards** across the Hospital.

Receiving Area

Preparation Bay

Dispensing Area

INFUSION NURSES SOCIETY
SETTING THE STANDARD FOR INFUSION CARE®

INS Audit – 14th & 15th March 2020

Welcoming INS Auditor – Ms. Josphine Cyril

Opening presentation by Capt. Neelam Deshwal(CNO)

Opening presentation by Ms. Josphine Cyril(Auditor)

Ms. Josphine Cyril(Auditor) in clinical areas for audit

Closing remarks by Ms. Josphine Cyril

Group photo with team nursing

Infusion Safety Guidelines	• Policy on insertion of peripheral IV Cannula in Nursing Manual • VIP Score is documented in nursing documents(Critical Care Flow Sheet, Daily Nurses Flow Sheet) • Infusion Therapy standard of practice as per INS guidelines • VAD Form • Competency Assessment is checked annually and staff is privileged accordingly.

TANGIBLE RESULTS

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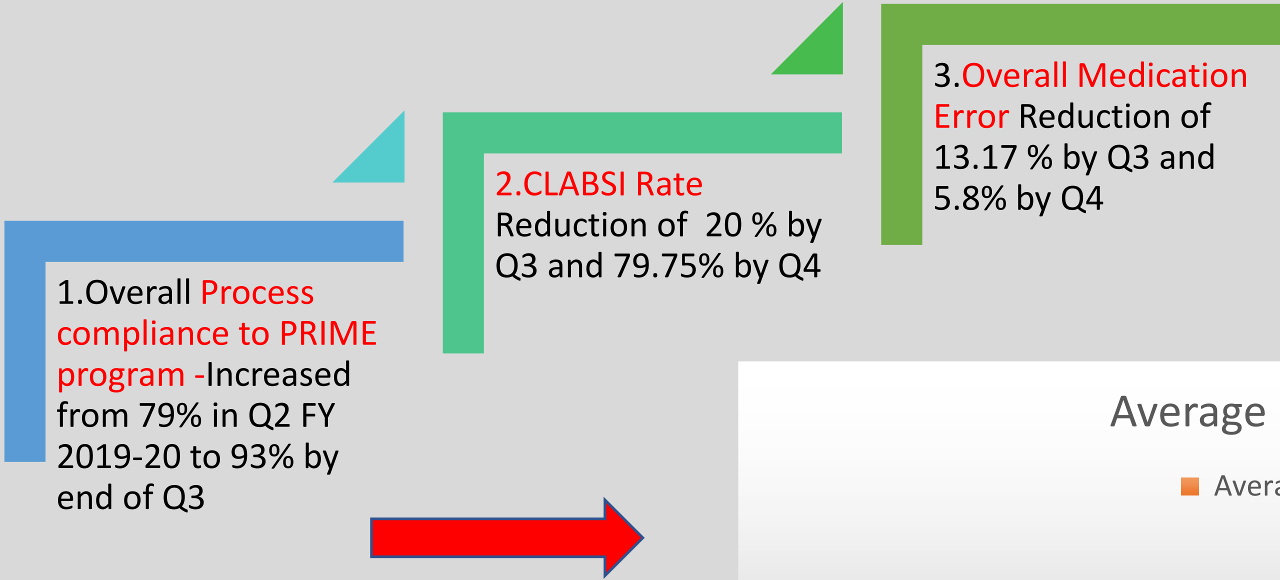
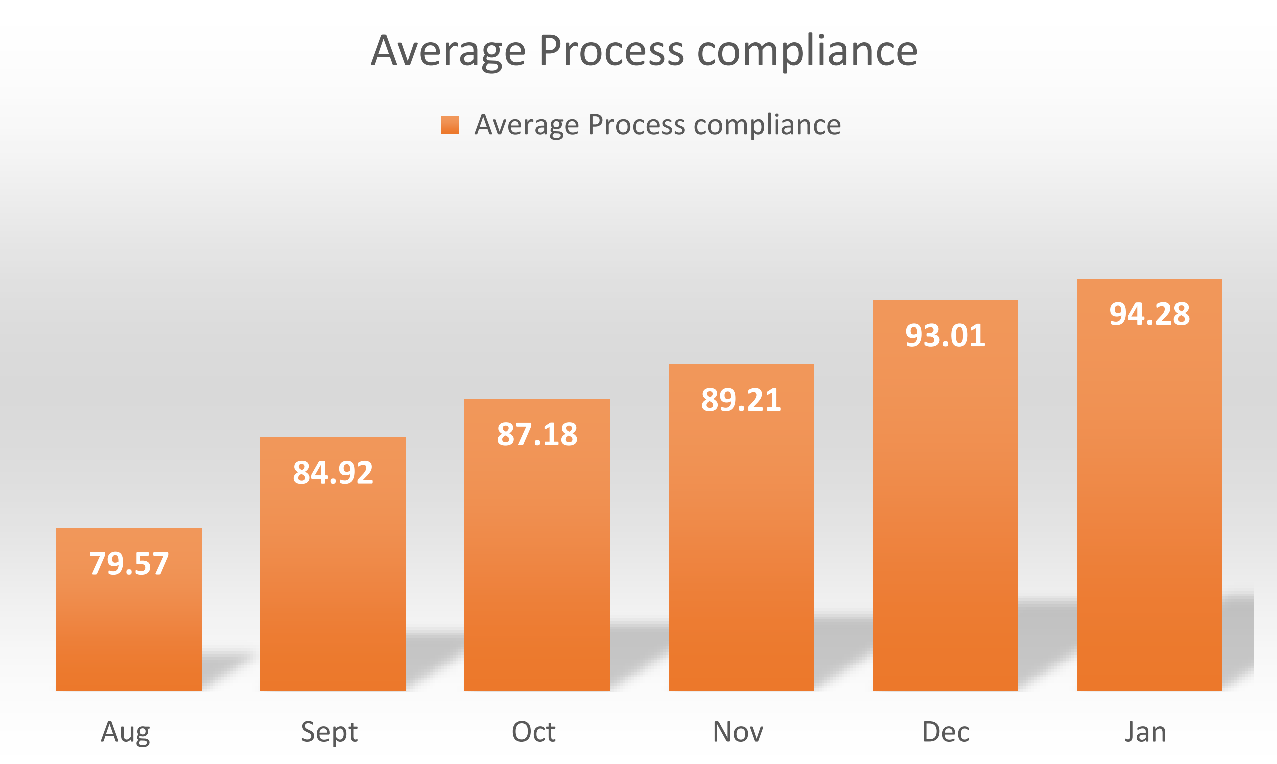
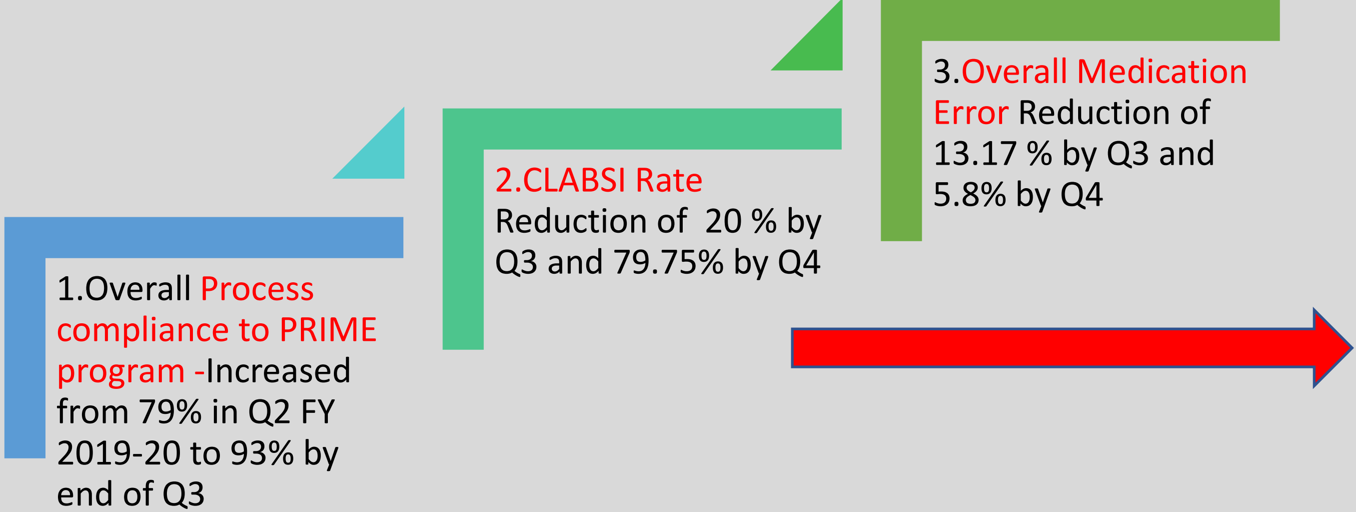
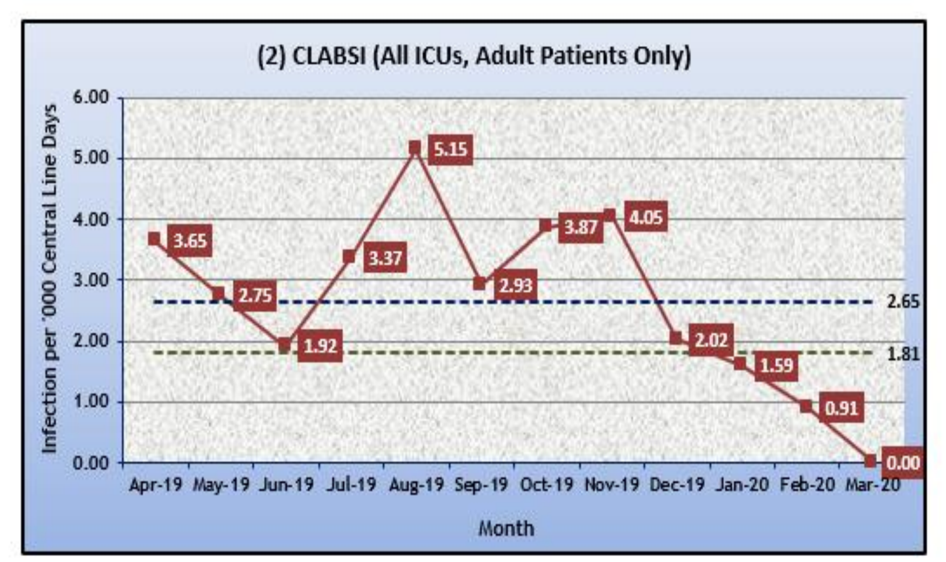




TANGIBLE RESULTS





Parameters	Pan Fortis Benchmark	Upper Control Limit	Lower Control Limit	Q1	Q2	Q3	Q4
Infection Control Parameters							
CLABSI per 1000 central line days	1.81	2.65	0.96	2.77	4.1(14)	3.31(10)	0.83 (4)

TANGIBLE RESULTS

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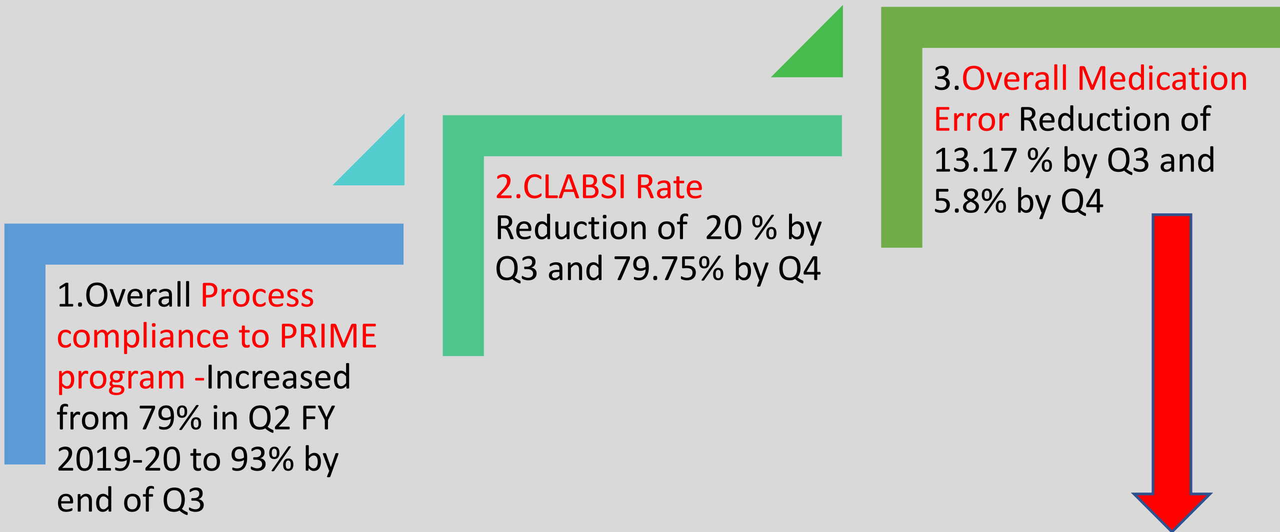

Parameters	Pan Fortis Benchmark	Upper Control Limit	Lower Control Limit	Q1	Q2	Q3	Q4
Medication Errors							
Total Medication Errors per 1000 patient days	2.75	7.53	0.00	4.19	4.25(106)	3.69(86)	4.00 (90)

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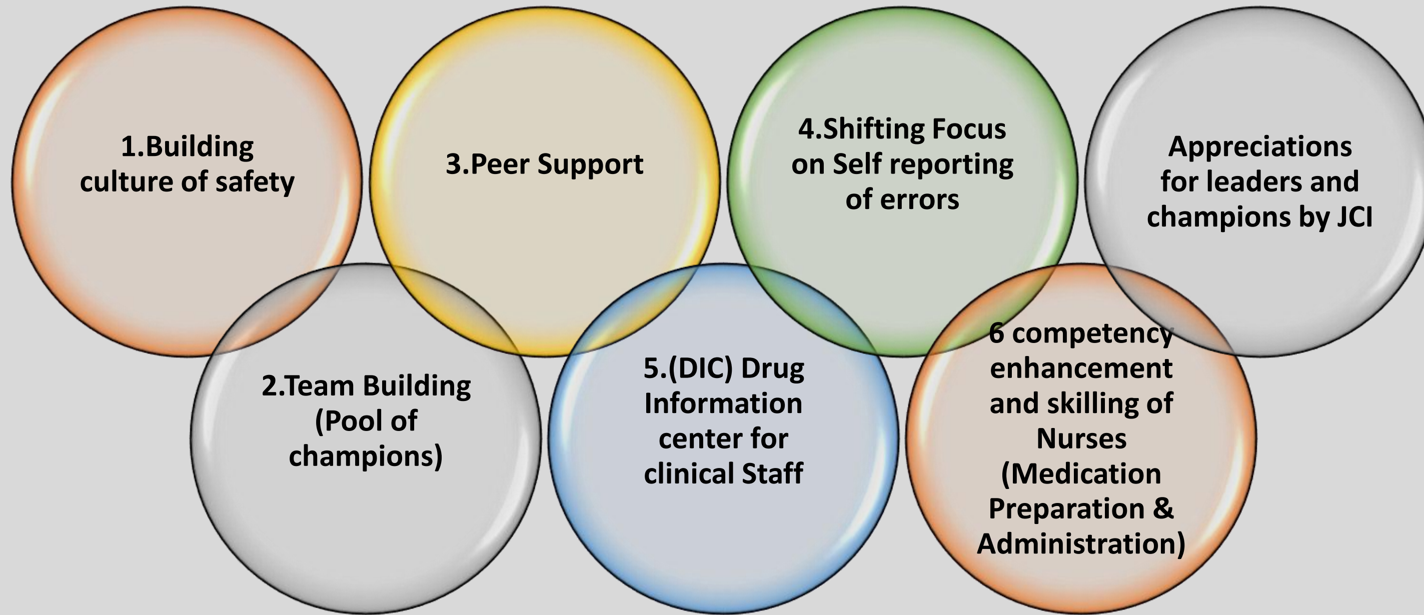
INTANGIBLE RESULTS



Extravasations if any recorded in CQI forms (Continuous Quality Improvement). Extravasations management trays are separately prepared to mange the cases.

Extravasation Kit

Articles - Extravasation Kit

Receiving Area

Preparation Bay

Dispensing Area

Preventing Risks of Infections and Medication Errors in IV Therapy

PRIME

CERTIFICATE OF APPRECIATION

Presented to PRIME Leader

Dr. Shweta Prabhakar

In recognition to the valued contribution for successful execution of PRIME Program

Dr. Jeannell Mansur, Pharm.D., FASHP
Principal Consultant
Joint Commission International

Dr. Jayant Giri MD

Joint Commission International

BD

Joint Commission International
PRIME
Preventing Risks of Infections and Medication Errors in IV Therapy
BD
Congratulations !!!

References

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- *http://apps.who.int/iris/bitstream/handle/10665/259941/9789290226260-eng.pdf;jsessionid=E0B4A6DE2297BADB6DB184DFE7DF72DB?sequence=1*
- *JCI stds -6th edition –IPSG3 &5,QPS,MMU,PCI*