



Failure Mode Effect Analysis (FMEA) Project on Paediatric Intravenous (IV) Cannula Care in KKH



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1. INTRODUCTION

Traditionally the paediatric IV cannula is secured by two pieces of anchoring tape under and over the cannula in a “figure of 8” fashion followed by a semipermeable dressing over the insertion site.

During change of dressing, nurses use a bandage scissors to cut the anchoring plaster and the semipermeable dressing that was stuck firmly together in attempt to free it from the cannula. In the process of cutting the adhesive plaster, patient might move and struggle, the tip of the IV cannula might accidentally be snipped off and dislodged in the patient’s vein.

2. AIM

The aim of this project is to prevent and or minimise adverse events associated with the management of peripheral intravenous cannula by ensuring a safe and effective practice for our paediatric patients.

A taskforce was formed to analyse the security and plastering of the intravenous cannula which might potentially compromise patient safety.

3. METHODOLOGY

FMEA is a systematic, proactive method designed to promote patient safety by mapping out the process of care, followed by identifying potential failures that may occur in this process, in order to identify the parts of the process that are most in need of change.

Using the FMEA model, the group analysed the entire process to secure a paediatric IV cannula. Potential failure modes that might impact on patient safety in the various sub-processes were identified as requiring improvements. The group then listed the appropriate safety measures that were necessary to prevent potential accidentally snipped off the IV cannula.

Failure Mode and Effect Analysis Worksheet								
Processes & Sub-processes	Potential Failure Modes	Potential Causes	Potential Effects	Severity	Probability	Hazard	Total	Actions to Reduce Failure Mode
Preparation of IV cannula	Incorrect anchoring tape used on the IV cannula hub. No standardization on the quantity of semi-permeable dressing used. The technique of applying semi-permeable dressing over the IV cannula	Risk of IV cannula slipping out Patient struggle and uncooperative during the procedure	Re-insertion of IV cannula. Caused pain to the child. Additional workload for nurses and doctors	3	6	3	54	To standardize the methods of anchoring the IV cannula
Securing of IV cannula	Cannula kinked at the exit site caused by using of 2 pieces of anchoring tape to secure IV cannula. Criss-cross method will hinder the assessment of insertion site by the nurse. IV cannula slipping out. Unable to apply anchoring tape and semi-permeable dressing effectively due to child struggling and uncooperative	Patient struggle and uncooperative Anchoring tape was stuck together with the semi-permeable dressing hence causing difficulties in removal	Re-insertion of IV cannula Lack of trust between parents and health care workers Causing pain to the child Lack of co-operation from the caregivers Causes undue stress to the child and caregiver	7	5	5	175	Eliminate the practice of using 2 pieces of anchoring tape to criss-cross “figure of 8” over the cannula hub. Use a single piece of water proof semi-permeable dressing over the hub of the cannula to secure cannula
Changing of IV cannula dressing	Unable to remove or separate the semi-permeable dressing from the anchoring tape therefore the nurse has to use scissors to aid in removal.	Accidental pulling of IV cannula out from the vein while attempting to remove the semi-permeable dressing. Accidental snipping of IV cannula	Migration of IV catheter can potentially cause lodgment of broken cannula at the vital organ. Stroke/ Death	10	2	6	120	During change of dressing, eliminate the use of bandage scissors to cut or separate the dressing

4. RESULT

Post implementation, a different technique of securing IV cannula without using a criss-cross tape over the hub was implemented. The cannula was directly secured using a semi-permeable transparent dressing, which has shown significant reduction in risk priority number scores, which indicate the success of FMEA in minimizing patients’ harm.

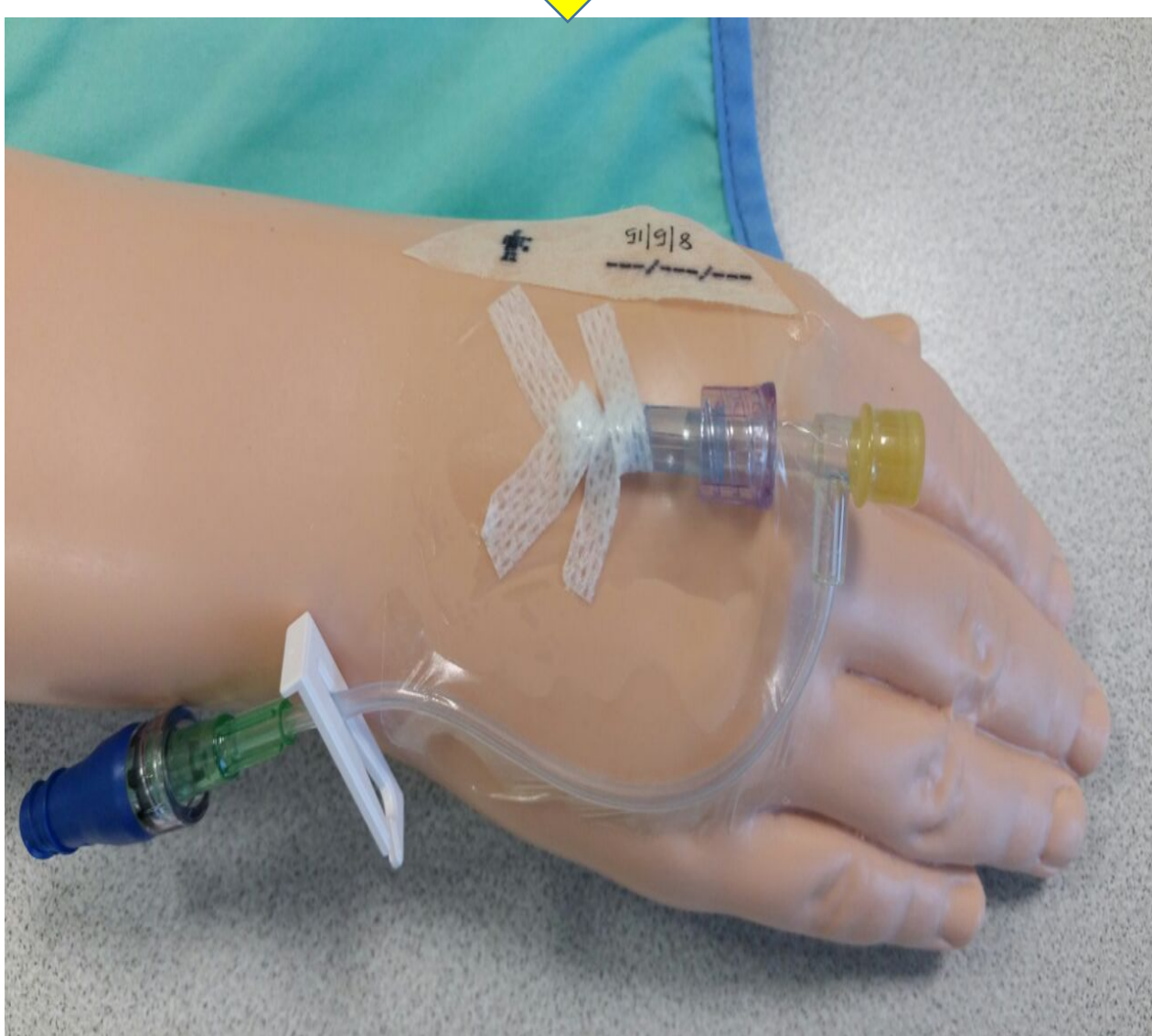
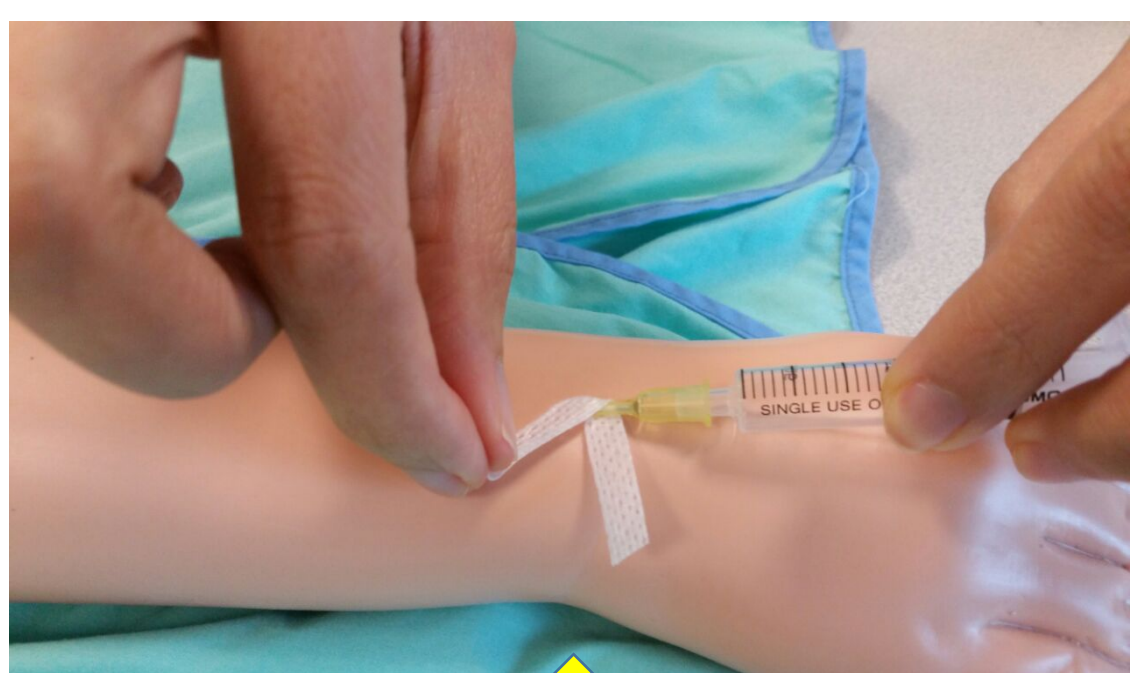
Data from 2 piloted paediatric wards were collected for 2 months in 2014 via an observational study. A total of 130 samples were collected using the new technique of securing the IV cannula, which has shown favorable findings of the outcome. The risks of mortality and morbidity of patients resulting from catheter dislodgement will be eliminated.

5. CONCLUSION

With the development of new technique in securing the IV cannula, we have achieved our goal of eliminating the potential risks of accidental snipping of catheter tip resulting in fatal harm in this group of patients.

Mortality and morbidity of the patients will be eliminated, unnecessary length of stay will be reduced, saving cost for the patients and reducing potential legal liability.

Pre- Implementation



Post- Implementation

