Development and Implementation of a Pediatric PIV Maintenance Bundle

Christal Cabanting, BSN
Nursing, Loma Linda University Children's Hospital, Loma Linda, CA, USA

Purpose

To reduce the loss of peripheral intravenous lines (PIV) in children and create an IV maintenance bundle for the pediatric step-down unit.

Background

In many instances, successful IV insertion in children require two to three attempts. Maintaining the IV site becomes a priority; without preventive measures, there is a high rate of accidental site loss. Premature loss of IV access can result in multiple IV starts which can increase in the number of pokes a child must undergo creating a painful traumatic experience. The loss of a peripheral intravenous line can delay administration of IV medication, impact treatment options and increase length of stay as well as high use of IV supplies which can become costly to the hospital. Currently, there is no standard peripheral intravenous maintenance bundle which leads to high variability amongst registered nurses attempting to maintain peripheral intravenous sites. Parental knowledge of how to assist with maintaining peripheral intravenous site care was also found to be minimal.

Methodology

The PICOT question for this project was: For pediatric patients on the step-down ICU unit, can the use of an IV maintenance bundle reduce the risk of loss compared with the standard practice within a thirty-day period?

Setting: An intermediate stepdown intensive care unit in a Level I academic children’s hospital. The trial took place during the summer months of August-September 2018.

Sample: All children ages 0-18 with chronic and acute medical/surgical conditions admitted to the stepdown unit during the trial were included.

Implementation

The evidence-based peripheral intravenous maintenance bundle consisted of: the IV HOUSE Ultradome and TLC splints. Input and approval was obtained from nursing leadership, professional governance council, and children’s hospital clinical practice council. The IV HOUSE Ultradome and TLC splints were provided for evaluation free to the facility. Prior to implementation, unit clinical staff were inserviced on the project and bundle via unit staff meeting, 1:1 nurse discussion and presentations by the IV House company educational representative. Tools for the education of the staff included a creative bedside sign, educational video and poster. Parents were educated regarding the bundle and how to participate in the care of their child’s peripheral intravenous site by using the bedside sign that included a rhyme that went with the acronym of TLC (Touch, Look, Compare). The permission for use and adaptation of TLC acronym was obtained from Cincinnati Children’s Hospital. The Peripheral Intravenous Maintenance Bundle was then piloted during a thirty-day period.

Outcomes
A total of 68 children participated with total of 218 peripheral intravenous sites. The intravenous maintenance bundle was used in 67 (31%) of peripheral intravenous sites. There was a 21% loss of peripheral intravenous lines in sites where the bundle was not used and a 2.7% loss in sites that utilized the bundle.

The nursing staff evaluations the TLC splint revealed that:

- 69% found that the TLC splints selection was easy to do
- 85% found that the TLC splint effectively stabilized the joint
- 73% found that no additional tape or securement was needed
- 84% found that there was no interference with site availability due to straps
- 88% of patients did not have any skin breakdown noted. The few that identified skin issues did not include breakdown but slight indentations of the skin

Of the nurses completing the forms on the IV House Ultradome

- 88% of those completing the forms on the IV House Ultradome found it to be useful
- 88% found that PIV site was easily visualized
- 94% found the IV House Ultradome to be safe (not skin breakdown)
- 88% felt that the IV House Ultradome provided increased protection of the PIV insertion site

Conclusions

A peripheral intravenous maintenance bundle that includes protective splints and domes is effective in maintaining peripheral intravenous sites in children. Visual aids such as the 'TLC' sign can be helpful to remind staff and parents about preventing the loss of the peripheral intravenous site. Staff felt that the IV dome was easy to use. However, ease of use of the splints was variable depending on the type of splint needed or required. The majority of nursing staff who participated in the product survey found the splints effective in maintaining the stability of the joint and increasing visibility of the peripheral intravenous site compared to standard splints. The IV house was found to be highly effective in increasing the ability to check the site with minimal disruption.

Clinical Implications

The use of an IV maintenance bundle can result in a reduction in the number of pokes a child must undergo, increased parental knowledge and participation in keeping a peripheral intravenous site. The preservation of a peripheral intravenous site can improve the quality of the stay in the hospital for both the child and the parent. Two areas of limitation were children with contractures and the infrequent child whose size exceed the products available.

Title:
Development and Implementation of a Pediatric PIV Maintenance Bundle

Keywords:
IV, maintenance and pediatrics

References:


Abstract Summary:
In order to reduce the loss of peripheral intravenous sites (PIV) in children, an evidence based practice project was conducted using innovative splints and a protective dome. This project found that these devices reduced PIV loss from 21% to 2.7%.

Content Outline:
Content Outline

I. Introduction

1. In many instances, successful IV insertions in children require two to three attempts.

2. There is no standard peripheral intravenous maintenance bundle which leads to high variability amongst registered nurses attempting to maintain peripheral intravenous site

II. Body

1. The PICOT question for this project was: For pediatric patients on the step-down ICU unit, can the use of an IV maintenance bundle reduce the risk of loss compared with the standard practice within a thirty-day period?
III. Conclusions

1. A peripheral intravenous maintenance bundle that includes protective splints and domes is effective in maintaining peripheral intravenous sites in children.
2. Visual aids such as the ‘TLC’ sign can be helpful to remind staff and parents about preventing the loss of the peripheral intravenous site.
3. The majority of nursing staff who participated in the product survey found the splints effective in maintaining the stability of the joint and increasing visibility of the peripheral intravenous site compared to standard splints.
4. The IV house was found to be highly effective in increasing the ability to check the site with minimal disruption.
5. The use of an IV maintenance bundle can result in a reduction in the number of pokes a child must undergo, increased parental knowledge and participation in keeping a peripheral intravenous site.

First Primary Presenting Author

Primary Presenting Author
Christal Cabanting, BSN
Loma Linda University Children's Hospital
Nursing
Clinical Registered Nurse
Loma Linda CA
USA

Author Summary: Christal Cabanting joined Loma Linda University Children's hospital in 2016. She is currently employed on a pediatric step down intensive care unit where she works as a floor nurse and active member of her shared governance council. She is also LLUCH's Evidence Base Practice Nursing Fellow where she implemented a peripheral intravenous maintenance bundle to reduce IV loss on the pediatrics patients on the step down intensive care unit.