

**Dr. Adel Elsharkawy MD FRCPC FAAP**  
**Department of Pediatrics-University of Calgary, AHS-Calgary Zone**

Peripheral intravenous (PIV) insertion is the most common invasive procedure performed in neonatal intensive care. Central venous insertion has been used in neonates since the 1940's, but due to an increased frequency of complications, the preferred route for infusion of fluids, nutrients and drugs is peripheral. However, this procedure also has its disadvantages including pain and stress to both neonates and families. This procedure utilizes time, supplies and if prolonged, may interrupt care for the neonate. Repeated insertion attempts may also put the neonate at risk for infection, bruising, as well as wound and skin disorders.

### Statement of the Problem

Many neonatal intensive care units (NICU) have policies for PIV insertion, but lack consistency and are sometimes out of date. Currently, there are no studies performed in the NICU to estimate PIV insertion failure rates. PIV insertion is a task which requires: clinical practice guidelines, the use of specialty medical equipment, staff training and expertise, and patient and family centered care.

### Aim

To estimate the success and failure rates of PIV insertion attempts at the South Health Campus (SHC) NICU.

To examine common factors associated with failed PIV insertion attempts.

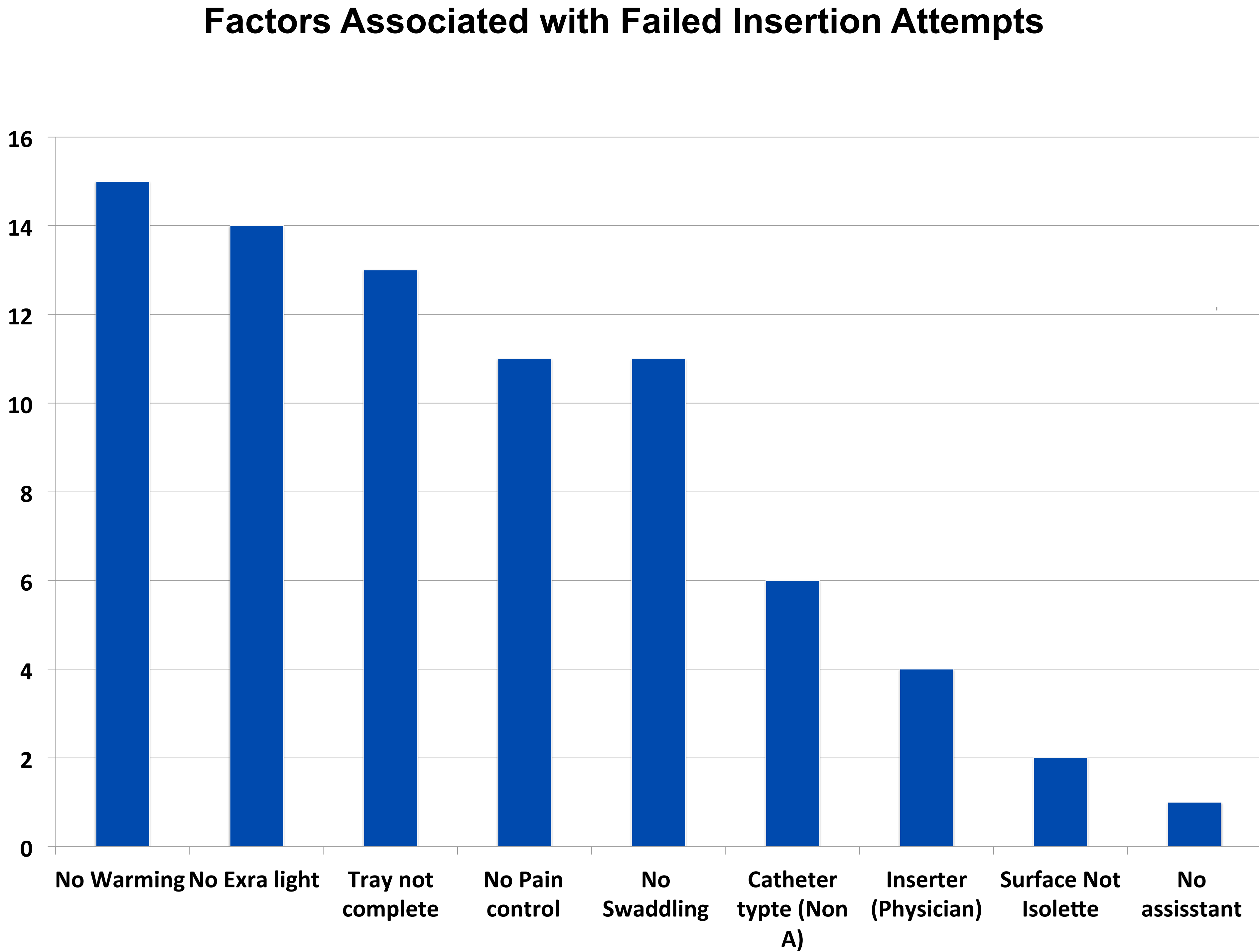
### Methods

Neonatal PIV insertion numbers were obtained from SHC NICU (Jan 2016 to Feb 2016). The data was collected immediately post-procedure to insure that regular standard procedures were not affected. All information was recorded in an excel spreadsheet including the patient characteristics and 14 variables considered during the insertion process (see chart).



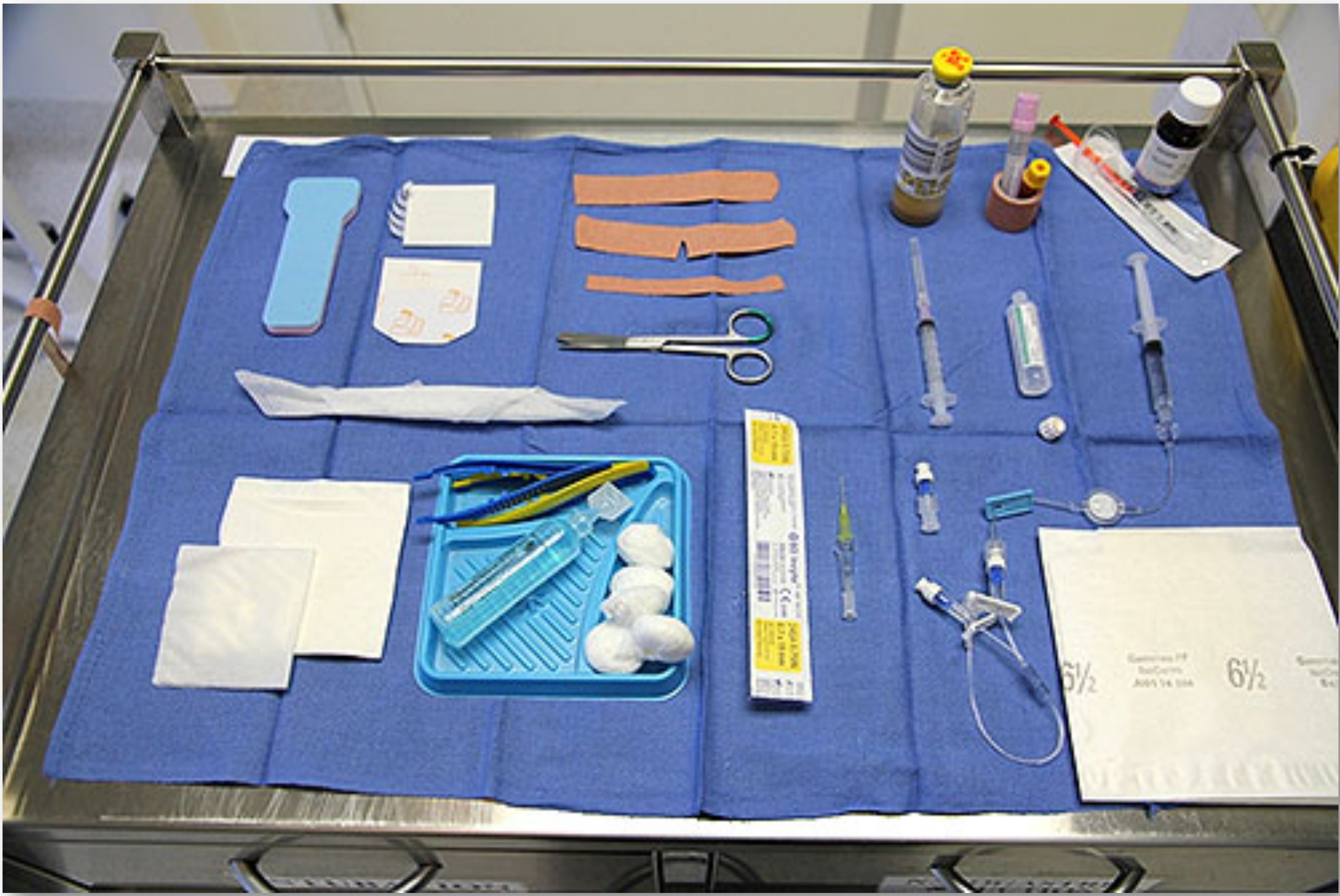
Characteristics of the study group

### Results



Seventeen neonates were studied with an average gestational age of 36 weeks, an average weight of 2.600kg and average actual age of 1 day. Out of the 68 PIV insertion attempts, only 17 were successful (~4 attempts for each successful insertion).

It is important to acknowledge that currently there is no consistent nursing or physician training around PIV insertions at the SHC NICU. The most under utilized steps included: warming the site of insertion, pain management, swaddling, use of an extra light source and having the PIV tray prepared in the way shown in the illustration (upper right).



PIV Insertion Tray

### Conclusion and Next Steps

PIV insertion in neonates is both a complex and challenging procedure which requires up to date policies, training and equipment.

A larger QI project is necessary to estimate the problem and it's implication to neonates, families and staff.

A PDSA (Plan, Do, Study, Act) cycle which focuses on the 5 most commonly missed steps associated with the failure of the PIV insertion may assist in a 50% reduction in failure rate .

### Acknowledgments

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