

RAPID RESPONSE TEAM EVIDENCE-BASED PIV INSERTION PROJECT

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Purpose and PICO Question

The purpose of this peripheral intravenous (PIV) insertion project is to evaluate the use of a standardized PIV insertion algorithm which includes use of ultrasound guidance to insert PIVs in the adult medical-surgical patients identified as “difficult to obtain PIV access”. In the adult acute care patient population identified as having difficult IV access, will implementation of a PIV insertion algorithm including the use of ultrasound technology increase successful PIV insertion rates and decrease delayed or missed therapy rates?

Background and Evidence Review

The adult medical-surgical population with difficult IV access is often “stuck” multiple times during PIV insertion attempts. This is a source of discomfort and dissatisfaction to many patients. Many of these patients have delays in treatment related to lack of PIV access. These treatments may include medication administration, blood product administration, and diagnostic procedures. Some studies have found an improvement in the ability to place an IV with the use of ultrasound and that IV insertion was accomplished in a timely fashion with decreased attempts made per patient. Other studies found no improvement in the insertion success or in the number of attempts. The need for a further study of the use of ultrasound for PIV insertion has been identified.

Methods

The rapid response team (RRTeam) collected baseline data from March to June 2009 on 193 calls for PIV insertion. This data demonstrated that delayed or missed medications or therapies/procedures related to lack of PIV access occurred 60% of the time. An average of 3.7 PIV insertion attempts per patient (Range was 0 to 12 attempts/patient) were made before the RRTeam was called to assist with insertion. The RRTeam was successful with PIV insertion 64% of the time. A standardized PIV algorithm was developed to include a limit of 3 insertion attempts and then a RRTeam consult to insert a PIV with or without ultrasound assistance based on their assessment. The PIV insertion project and the algorithm is being introduced to the staff of 9 medical-surgical nursing units. The RRTeam nurses are being trained on ultrasound use for PIV insertion and the algorithm. Data will be collected during the 3-month project pilot period in Fall 2009 to re-measure PIV attempts and related delays in treatments. The ease of use and helpfulness of the ultrasound device for PIV insertion will also be evaluated.

Results

During this three-month period, the RRT responded to 318 difficult PIV requests. This represents a 61% increase in requests. The success rate using the algorithm and/or the use of ultrasound was 81% from pre-intervention rate of 64%. In addition, the time factor also improved. Pre-intervention 31% of the time it took longer than 30 minutes but in the post-intervention phase, the percent decreased to 14%.

There was an improvement in overall missed medications administration from 60 to 55%. Missed IV fluid administration including blood administration also improved from 20 to 14%. Factors that did not demonstrate improvement included: antibiotic administration, pain medication administration, plus timing of radiology tests with IV contrast.

Conclusion

Given the purpose of this project, nine medical surgical units were involved. These nine units have continued to utilize the algorithm post pilot project time line. The RRT routinely incorporates the use of ultrasound involving difficult PIV calls.

The major challenges involved the adaption rate of the algorithm. The RRT calls increased by 61%. Covering these calls in a timely fashion was a challenge.

The major success was decreasing the PIV sticks to patients. RRT was able to successfully place a difficult peripheral IV 88% of the time with one to two attempts.

Limitations include time factor for RRT, limited ultrasound availability, plus educating the medical surgical nurses. Another issue that needs to be addressed is that the delay in administration of antibiotics and pain medications did not decrease in spite of timely IV placement. This issue still needs further investigation.

References

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