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Project #69: Improving the Documentation and Utilization of Alteplase as a Declotting Agent for Specific Central Lines at Henry Ford Hospital

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WINNER

AIM

To improve the documentation and utilization of Alteplase as a declotting agent for patient with specific central lines: Peripherally Inserted Central Catheters (PICCs), Central Venous Catheters (CVCs), and Hemodialysis Catheters (HD).

Origins and Planning

- Michigan Hospital Medicine Safety Consortium (HMS), is a Collaborative Quality Initiative that helps to facilitate information sharing for Michigan hospitals to improve patient safety and quality of care of hospitalized medical patients[1]. HMS is supported by the Blue Cross Blue Shield Value Partnerships Program.
- Goal of the consortium is to improve the quality of care for hospitalized medical patients who are at risk for adverse events; including complications related to PICCs
- Alteplase is a tissue plasminogen activator (t-PA) that is indicated for the restoration of function to lines such as: CVCs, PICCs, and HD Catheters.[2] The average wholesale cost of Alteplase 2mg is $295.66.
- These lines may develop thrombolytic occlusions that can be resolved by the instillation of Alteplase
- HFHS Tier 1 Alteplase 2mg Central Venous Declotting policy, that was updated in March of 2022, specifically states that a line/lumen can only receive Alteplase twice within a single admission[2]. More than 2 administrations in one hospitalization, to a lumen is considered inappropriate use.
- An HMS assigned project dedicated to occlusions that began in 2019, showed that Alteplase was often being utilized for central access lines prior to any non-pharmacologic interventions being documented or attempted.

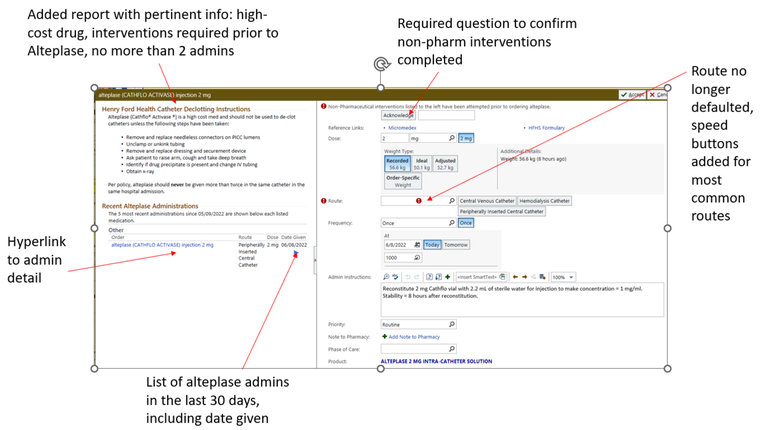
Interventions

- Members of invested stakeholders, including team members from Quality and Safety, Unit Education (IR), the PICC team (IR), and Analytics met to design a data analysis report that revealed 6 months prior to any changes in the ordering process or education, Alteplase was being used inappropriately in the cases audited: PICCs (20%), CVCs (100%), and HD Catheters (36%).
- Data analysis also demonstrated that during the ordering process lines were not being identified correctly and were often only identified as ‘Intra-catheter’. This can be confusing when patients have multiple central lines.
- Survey was distributed to inpatient nursing and found an education gap in troubleshooting malfunctioning central lines.
- New ordering process was developed with the following:
  - Report with important information including high-cost drug, interventions required, and limit of only 2 admins per admit
  - Required acknowledgment that non-pharmacological troubleshooting was attempted prior to the instillation of Alteplase
  - Included speed buttons identifying the specific lines to receive Alteplase should it be indicated
  - Hyperlink to administration detail
  - List of previous administrations within the last 30 days
- Interventional Radiology Education Specialist and PICC team leader composed video education to demonstrate proper technique for the instillation of Alteplase for single lumen and multi-lumen central lines

Non-Pharmacologic Interventions

- Remove and replace needless connectors on PICC lumens
- Unclamp or unkink tubing
- Ask patient to raise arm, cough and take deep breath
- Identify if drug precipitate is present and change IV tubing
- Obtain x-ray
- Additional intervention not included in the order set but presented in education to staff, is to contact the PICC team with any questions and assistance with troubleshooting during the hours that the team is available.

Updated Ordering Process



Post Order Data

- 6 months post-order change analysis saw improvement in appropriate line designation and in appropriateness of use.

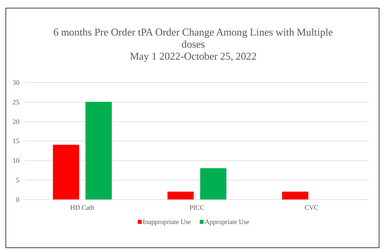


Figure 1

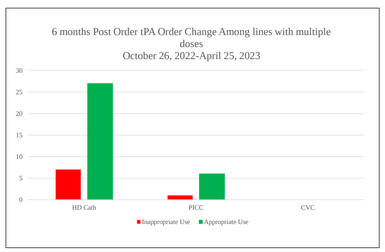


Figure 2

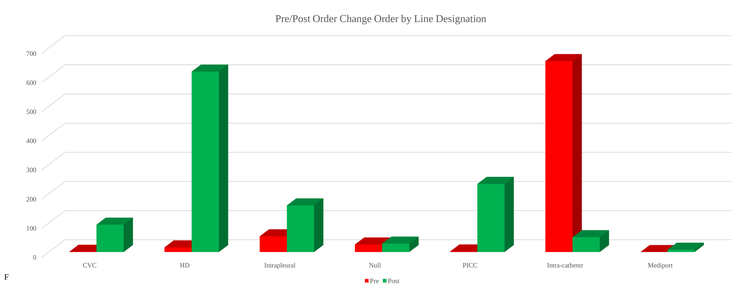


Figure 3

Figure 1. Inappropriate vs appropriate use pre order changes Figure 2. Inappropriate vs appropriate use post order changes Figure 3. Appropriate line designation pre vs post order changes

Outcomes

- We have seen an improvement in inappropriate use (i.e. <2 administrations of Alteplase per admission):

	Pre Order Change Inappropriate Use	Post Order Change Inappropriate Use
PICC	20%	12.5% ⬇
HD Cath	36%	21% ⬇
CVC	100%	0% ⬇

- 95% drop in ‘Intra-catheter’ route selection post order change:
  - ➢ Pre- Intra-catheter route selection: 518
  - ➢ Post- Intra-catheter route selection: 27
- Overall decrease in Alteplase use for declotting of CVCs, PICCs, and HD catheters of 15%
  - Pre-order change number of administrations: 674
  - Post-order change number of administrations: 573
- This decrease relates to an overall cost savings of $29,862 (cost of 2mg vial of Alteplase is $295.66 x 101 fewer administrations)

Sustainment Plan

- The data analytic report is set to currently run monthly and can be referenced to continue to monitor ongoing progress or concerns
- Data will continue to be reported on in both bi-monthly PICC committee meetings and quarterly system PICC committee meetings
- Can reinstitute additional targeted education if there are noticeable unfavorable trends

Key Learnings

- One of our greatest keys to success is our continued dedication to collaboration with our multidisciplinary teams and site leadership. This has enabled us to build strong relationships and communication that assists us in improving patient outcomes and safety.
- An important initial finding was the recognition of a gap in education towards the ordering and proper administration of Alteplase. Our team worked to address this and will continue to monitor for the sustainability of the process changes and of the education that was circulated.

References

1. *Overview*. Overview | Michigan Hospital Medicine Safety Consortium. (n.d.-a). https://mi-hms.org/

2. Viewing Tier 1: Cathflo Activase (Alteplase) 2 Mg: Central Venous Catheter Declotting (policystat.com))