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Evaluation of the Transition to a Fixed-Dose Prothrombin Complex Concentrate Regimen at a Tertiary Regional Medical Center

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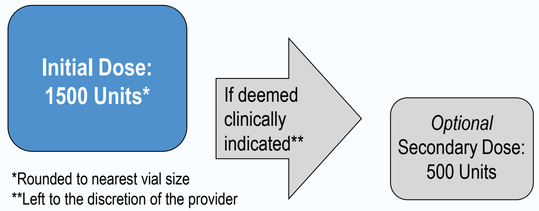
Background

- Prothrombin complex concentrate (PCC) for the reversal of vitamin K antagonists (VKA) induced anticoagulation was approved for use in the US in 2013.[1] National guidelines recommend PCC over fresh frozen plasma for rapid reversal of anticoagulation in patients with VKA-associated major bleeding.[2]
- Approved dosing for PCC is based on pre-treatment INR and body weight.[1] Other dosing strategies, including fixed-dose protocols utilizing doses lower than manufacturer recommendations, have been found to be effective. No dosing strategy has proven to be superior to another.
- In November of 2014, St. Cloud Hospital implemented an order set that included PCC orders for warfarin reversal to encourage consistent use among providers.
- In September of 2016, all PCC orders, including those on the reversal order set, were changed to a fixed-dose of PCC for warfarin reversal.



*Rounded to nearest vial size
**Left to the discretion of the provider

- References

1. *Kcentra [package insert]. Marburg, Germany: CSL Behring. Available at:http://labeling.cslbehring.com/PI/US/Kcentra/EN/Kcentra-Prescribing-Information.pdf*
2. *Holbrook A, Schulman S, Witt D, Vandvik P, Fish J, Kovacs M et al. Evidence-Based Management of Anticoagulant Therapy. Chest. 2012;141(2):e152S-e184S.*

Objectives

- Evaluate order set use in patients that received PCC for emergent warfarin reversal in the **emergency department** both before and after implementation of a fixed-dose protocol
- Evaluate INR response to administration of PCC pre- and post-implementation and the percentage of post-infusion INRs that were less than 2 and 1.5
- Assess cost of therapy before and after implementation of the fixed-dose protocol

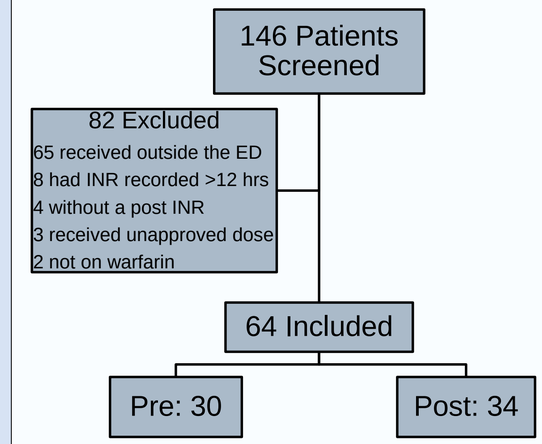
Methods

Study Design
- IRB-approved, retrospective chart review
- Trial periods:
  - August 1, 2015 through July 31, 2016
  - November 1, 2016 through October 31, 2017

Analysis
- Continuous variables were assessed using Student's *t*-tests
- Categorical variables were assessed using χ^2 tests

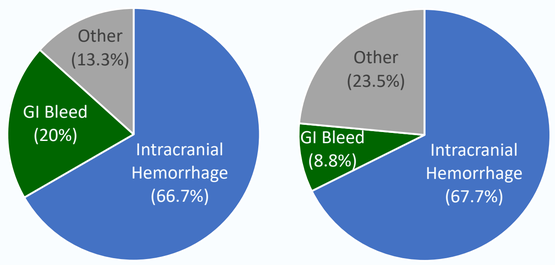
Inclusion Criteria	Exclusion Criteria
≥ 18 years	Not receiving warfarin
PCC for emergent warfarin reversal in ED	Did not receive indicated dose
	INR not recorded or not recorded within 12 hours postdose

Results

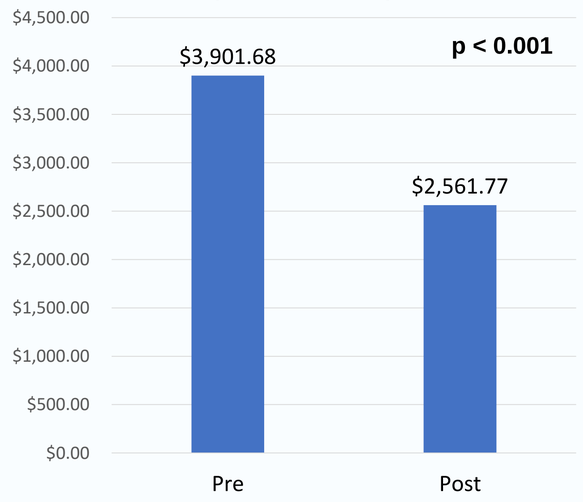


Patient Characteristics	Pre	Post	P-value
Age (mean, SD)	73.9 (13.6)	76.7 (9.7)	0.18
Weight (kg, mean, SD)	86.6 (24.5)	88.3 (23.1)	0.39
Sex (% male)	63.3%	61.8%	0.9
Presenting INR (mean, SD)	3.64 (2.37)	3.61 (2.24)	0.48
Post INR (mean, SD)	**1.23 (0.17)**	**1.37 (0.17)**	**0.001**
Dose (units, mean, SD)	**2454 (732)**	**1611 (97)**	**< 0.001**

Indications for PCC

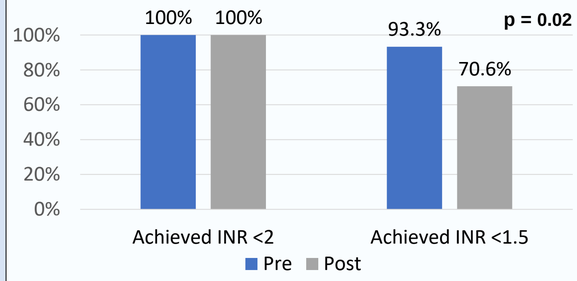


Mean Acquisition Cost per Dose



Results

Assessment of INR after 1 Dose of PCC



- The mean weight of patients who did not achieve an INR of < 1.5 was 92.4 kg in the post-group compared to 86.6 kg in the pre-group (p = 0.28)
- Order set use was similar in both groups (60% in pre-group vs 55.9% in post-group, p = 0.74)
- Time from presenting INR to PCC administration was 1.45 hours (SD = 2.37) and 1.53 hours (SD = 2.24), respectively (p = 0.41)
- Time from PCC administration to post INR was 2.24 hours (SD = 0.17) and 2.75 hours (SD = 0.17), respectively (p = 0.2)

Discussion

- The pre-implementation group more frequently achieved an INR < 1.5 compared to the post-implementation group (p = 0.02). The average INR was less than 1.5 in both groups, but significantly higher in the post-implementation group.
- The average cost of therapy was significantly less in the post-implementation group. The total acquisition costs of PCC were $117,055.80 and $87,100.20.
- Order set use was similar in both groups. No patient in the post-implementation group received an additional 500 unit dose. Patients in this group had statistically higher postdose INRs.

Disclosure

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.

- John Mullen: Nothing to Disclose
- Lance McNab: Nothing to Disclose