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Implementation of 4T score documentation on PF4 testing in patients with Suspected heparin induced thrombocytopenia (HIT)

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Title: Implementation of 4T score documentation on PF4 testing in patients with Suspected heparin induced thrombocytopenia (HIT)

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Background: Heparin induced thrombocytopenia (HIT) is a potentially life-threatening complication of heparin therapy. HIT is caused by antibodies directed against complexes formed by platelet factor 4 (PF4) and heparin. This complication leads to thrombosis and concomitant thrombocytopenia. The diagnosis of HIT requires both clinical and laboratory evaluation. The 4T score is a pretest clinical scoring system recommended by the American Society of Hematology to assess the probability of HIT. Immunoassays such as the ELISA H-PF4 are widely used to detect the presence PF4/heparin antibodies in serum and are recommended following a moderate to high probability 4T score. Subsequently, a functional assay called the Serotonin Release Assay (SRA) is utilized to confirm the diagnosis of HIT for patients with a positive PF4. Baptist Hospital of South Florida (BHSF) implemented a HIT testing algorithm and SRA reflex testing on PF4 orders for treatment in patients with suspected HIT. As of 2021, BHSF put into practice a mandatory documentation of 4T scoring prior to ordering. The purpose of this project is to assess the implementation of this documentation and subsequent treatment in patients with a suspicion for HIT.

Methods: This is a multi-center chart review of patients admitted to BHSF between January 1, 2020 and November 30, 2022, with an order for PF4 testing. Patients were excluded if they had a prior history of HIT. A further chart review was conducted for patients with a positive PF4 result. The primary outcome was the number of PF4 orders following implementation of 4T score documentation testing and percent positivity of HIT testing results. Secondary outcomes included Secondary outcomes included number of SRA ordered and SRA results, time for SRA to result, heparin allergy reporting, and argatroban utilization. Primary outcomes were measured via chi-squared tests.

Results: Implementation of mandatory 4T score documentation, PF4 antibody decreased by 68% in 2 years ($p < 0.0001$). 4T score documentation improved percent positivity of HIT diagnostic testing in increasing positive PF4 results from 12 to 24% ($p = 0.60$) and positive SRA results from 19 to 44% ($p = 0.35$). Approximately 37% of patients reported a heparin allergy despite a negative SRA. Similarly, 37% of patients with a negative SRA continued argatroban for more than 24-hours from SRA result. The mean duration of argatroban use was 6.8 days in patients with a negative SRA and 2.4 days for patients with a negative PF4.

Conclusions: The implementation of 4T score documentation prior to ordering PF4 laboratory tests lead to a statistically significant decrease in PF4 ordering and improved the percent positivity of HIT diagnostic testing.