

Background

Unfractionated heparin is an anticoagulant with a rapid onset and offset of action that is often used in the treatment of acute coronary syndromes (ACS) and venous thromboembolism (VTE). Heparin infusions require frequent laboratory monitoring by collecting partial thromboplastin time (PTT) and adjusting infusion rates to achieve a targeted therapeutic range. Nursing staff are responsible for starting and adjusting heparin infusions according to institution-specific protocols utilizing PTT values reported in the patient's chart.

Objective

To evaluate the time from laboratory charting an out of range PTT level to heparin infusion rate adjustment by nursing staff.

Methods

- Retrospective electronic chart review
- 102 patients who had at least one out of range PTT (≤ 44 or ≥ 69) with a subsequent heparin rate adjustment
- May 1, 2019 through July 31, 2019
- Data collected includes: patient's weight, age, gender, heparin protocol utilized, baseline PTT, starting rate, PTT level, time of PTT level result, indication for heparin use, time of adjustment, nursing unit, department drawing the PTT level, and rate adjustment
- Exclusion criteria: no rate adjustment documented, no out of range PTTs, heparin infusion not for VTE or ACS protocol, infusion stopped before PTT drawn

Results

Demographics

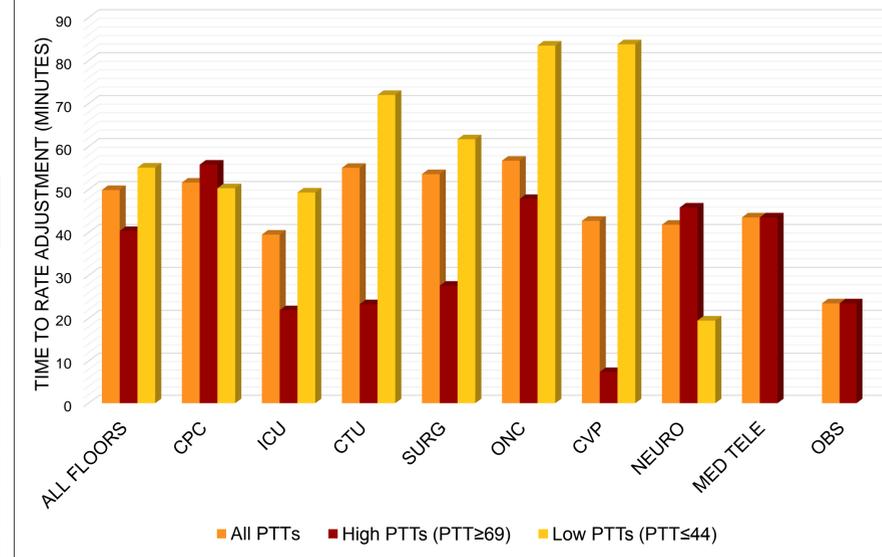
Male (%)	62 (60.8)
Weight (kg)	93.6 \pm 28.4
Age (years)	65.6 \pm 12.4

Nursing Unit

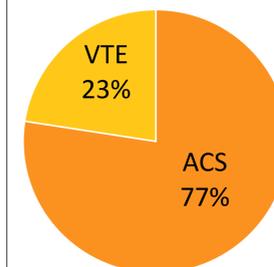
Out of range PTTs n=257

Cardiac Progressive (CPC)	137 (53.3%)
Intensive Care Unit (ICU)	28 (10.9%)
Cardiothoracic Unit (CTU)	25 (9.7%)
Surgical (SURG)	21 (8.2%)
Oncology Progressive (ONC)	16 (6.2%)
Cardiovascular Pavilion (CVP)	13 (5.1%)
Neuroscience (NEURO)	13 (5.1%)
Medical Telemetry (MED TELE)	2 (0.8%)
Observation (OBS)	2 (0.8%)

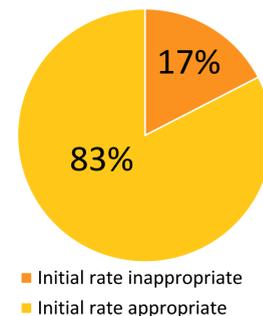
Average Time to Rate Adjustment



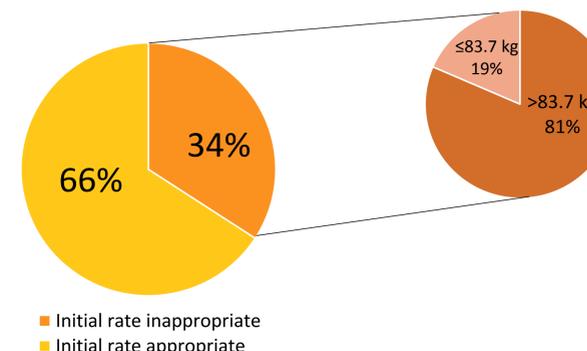
Protocol Utilized per Patient n=102



Accuracy of Initial Dosing in VTE Protocol, Based on 18 unit/kg/hr n=23



Accuracy of Initial Dosing in ACS Protocol, Based on 12 unit/kg/hr or Max 10 mL/hr n=79



Conclusions

- Average time to rate adjustment was 50 minutes
- Time to rate adjustment was higher when nursing drew the PTT (n=47) versus when lab drew the PTT (n=210) (64 minutes vs. 47 minutes)
- Time to rate adjustment was different between nursing staff shifts [night shift (n=162) 45 minutes vs. day shift (n=95) 58 minutes]
- Time to rate adjustment was higher in ACS vs. VTE protocols (52 minutes vs. 42 minutes)
- Notifying nursing staff by phone of critical PTT value (≥ 125) had a desirable impact on adjusting rates for high PTT values (≥ 69) [PTT ≥ 125 (31 minutes) vs. PTT 69-124 (44 minutes)]

Limitations

- Retrospective data collection
- Single-centered
- Charting accuracy

Next Steps

- Explore opportunities for pharmacy involvement
- Education of nursing staff
- Review policy compliance

References

- Drug Label Information: heparin sodium injection. Pfizer Laboratories Div Pfizer Inc. Last updated: 26 September 2019. Accessed 29 November 2019.
- Garcia DA, Baglin TP, Weitz JI, et al. Parenteral Anticoagulants-Antithrombotic therapy and prevention of thrombosis, 9th ed: American College of Chest Physicians evidence-based clinical practice guidelines. *CHEST*. 2012;141(2 SUPPL.):e24s-43s.

Disclosure

Authors have nothing to disclose concerning possible financial or personal relationships with commercial entities.