Heparin-Induced Thrombocytopenia (HIT) – Adults – Inpatient Clinical Practice Guideline

Target Population: Adult patients with suspicion or diagnosis of HIT

Full Guideline: *American Society of Hematology 2018 Guidelines for Management of Venous Thromboembolism: Heparin-induced Thrombocytopenia*

Pocket Guide: American Society of Hematology Diagnosis and Management of Heparin Induced Thrombocytopenia

Guideline Overview

- 4T scoring should be used to estimate the pre-test probability of HIT
- Laboratory testing and empiric treatment of HIT should be avoided in patients with a low-probability 4T score
- Choice of anticoagulant in the setting of acute HIT requires patient specific assessment
- In the setting of an intermediate or high 4T score and suspected HIT, it is reasonable to wait for immunoassay result prior to initiating non-heparin anticoagulation so long as the immunoassay has been ordered STAT. (*UW Health GRADE Very Low quality evidence; conditional recommendation)*

Figure 1. Algorithm for the diagnosis and initial management of patients with suspected HIT[1] - see explanatory notes on Page 2

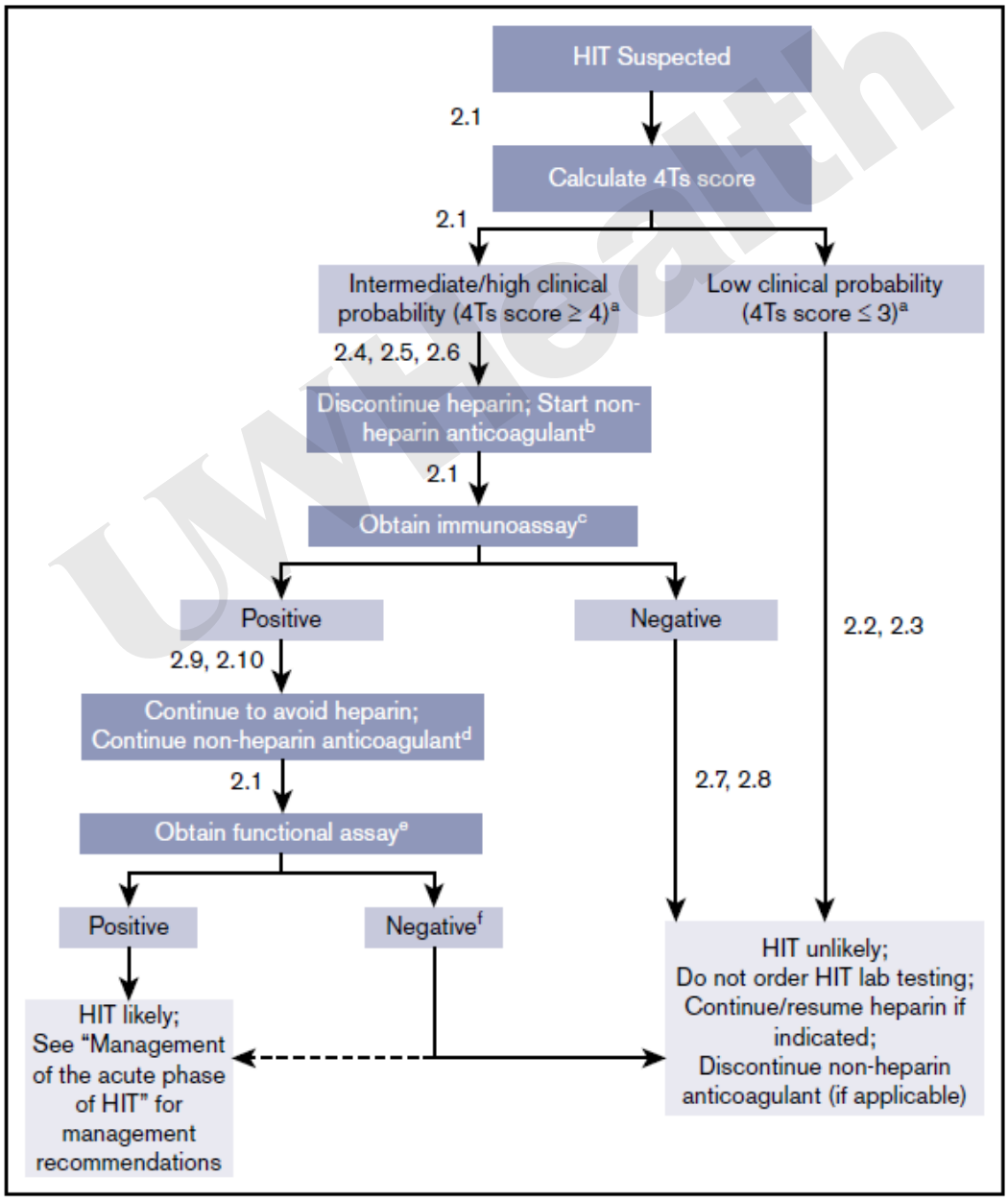

Figure 1. Numbered recommendations are listed in the corresponding portion of the guideline. Actions are in dark gray boxes; test results are in light gray boxes.

[a] Missing or inaccurate information may lead to a faulty 4Ts score and inappropriate management decisions. Every effort should be made to obtain accurate and complete information necessary to calculate the 4Ts score. If key information is missing, it may be prudent to err on the side of a higher 4Ts score. HIT laboratory testing may be appropriate for patients with a low-probability 4Ts score if there is uncertainty about the 4Ts score (e.g. because of missing data). Patients should be reassessed frequently. If there is a change in the clinical picture, the 4Ts score should be recalculated.

[b] If the patient has an intermediate-probability 4Ts score, has no other indication for therapeutic-intensity anticoagulation, and is judged to be at high risk for bleeding, the panel suggests treatment with a non-heparin anticoagulant at prophylactic intensity rather than therapeutic intensity. If the patient has an intermediate-probability 4Ts score and is not judged to be at high risk for bleeding or has another indication for therapeutic-intensity anticoagulation, the panel suggests treatment with a non-heparin anticoagulant at therapeutic intensity rather than prophylactic intensity. In a patient with a high-probability 4Ts score, the panel recommends treatment with a non-heparin anticoagulant at therapeutic intensity.

[c] Different immunoassays are available. The choice of assay may be influenced by accuracy, availability, cost, feasibility, and turnaround time. If an enzyme-linked immunoassay is used, a lower threshold is preferred over a high threshold.

[d] For all patients with a positive immunoassay, including those who were receiving prophylactic-intensity treatment with a non-heparin anticoagulant before the availability of the immunoassay result, the panel recommends treatment with a non-heparin anticoagulant at therapeutic intensity.

[e] Different functional assays are available. The choice of assay may be influenced by accuracy, availability, cost, feasibility, and turnaround time. In some settings, a functional assay may not be available, and decisions may need to be made on the basis of the results of the 4Ts score and immunoassay. A functional assay may not be necessary in patients with a high 4Ts score and a strongly positive immunoassay.

[f] Most patients with a negative functional assay do not have HIT and may be managed accordingly. However, depending on the type of functional assay and the technical expertise of the laboratory, false-negative results are possible. Therefore, a presumptive diagnosis of HIT may be considered for some patients with a negative functional assay, especially if there is a high-probability 4Ts score and a strongly positive immunoassay (represented in the figure by a dashed line).

Table 1. 4T Score[2]- Scoring is based on summation of all categories

4T	2 Points	1 Point	0 Points
Thrombocytopenia	• PLT fall > 50% AND nadir ≥ 20 AND no surgery within previous 3 days	• PLT fall > 50% but surgery within previous 3 days • PLT fall 30-50% or nadir 10-19K	• PLT fall < 30% • Any PLT fall with nadir <10K
Timing of PLT count fall	• Fall 5-10 days after heparin • Fall within 1 day after heparin and exposed to heparin within past 5-30 days	• Fall 5-10 days after heparin but unclear (e.g. missing counts) • Fall in 1 day after heparin with exposure in past 31-100 days • Fall after 10 days	• Fall ≤ 4 days without recent heparin exposure
Thrombosis or other sequelae	• Confirmed new thrombosis • Skin necrosis at injection site • Anaphylactoid reaction to IV heparin bolus • Adrenal hemorrhage	• Recurrent VTE while on therapeutic anticoagulants • Suspected thrombosis • Erythematous skin lesions at heparin injection sites	• Thrombosis suspected
O**t**her causes of Thrombocytopenia	• No alternative explanation for platelet fall	• Sepsis without proven source • Thrombocytopenia associated with initiation of ventilator • Other	• Within 72 hrs. of surgery • Confirmed bacteremia or fungemia • Chemo/radiation within 20 days • DIC due to non-HIT cause • Post-transfusion purpura • Drug induced thrombocytopenia • Other
Clinical Suspicion Scoring: 0-3 = Low, 4-5 = Intermediate, 6-8 = High			

Table 2. Diagnostic Laboratory Tests

Lab Test Name	Methodology	Utility	Performed at UW Health	Turn Around Time	Sensitivity	Specificity
Heparin Induced Platelet Ab (HCHEPAB)	Immunoassay	Highly sensitive rapid screening assay for HIT	Yes	2 hours (STAT) *if after 4pm call lab to arrange for STAT testing	> 95%	50-89%
P-selectin Expression Assay (HITPEA)	Functional assay	Highly specific confirmatory assay for weak or inconclusive heparin induced platelet Ab immunoassay results	No	24 hours	100%	95%

Non-Heparin Anticoagulant Treatment Options

Table 3. Therapeutic fondaparinux dosing[1]

CrCl>30mL/min Total Body Weight (kg)	Dose
<50	5 mg subcutaneous daily
50-100	7.5 mg subcutaneous daily
>100	10 mg subcutaneous daily

Table 4. Argatroban initial infusion rate[1-5]

Indication for dose adjustment	Initial infusion rate Based on total body weight
Normal hepatic function	2 mcg/kg/min
Critically Ill	1 mcg/kg/min
Moderate hepatic dysfunction (Child-Pugh Class B)	0.5 mcg/kg/min
Severe hepatic dysfunction (Child-Pugh Class C), ECMO, or heart failure	0.25 mcg/kg/min

Table 5. Argatroban infusion rate adjustments[3,4]

PTT	Adjustment	Monitoring Recommendations
<1.5x baseline PTT	Increase infusion rate by 20%	Recheck PTT 2 hrs after rate change
Goal 1.5-3.0 x baseline PTT (*Maximum 100 seconds)	Continue same rate	Recheck PTT in 2hrs; if within therapeutic range 2 consecutive times, check PTT every 12 hours.
>3x baseline PTT	Decrease infusion rate by 50%	Recheck PTT 2 hrs after rate change

Table 6. Bivalirudin initial infusion rate[6-10]

Estimated Creatinine Clearance (mL/min)	Initial Bivalirudin Infusion Rate (mg/kg/hr)
>60	0.15
30-60	0.08
<30/Renal Replacement Therapy	0.05

Table 7. Bivalirudin infusion rate adjustments[5,11-14]

PTT (seconds)	Dose Adjustment	Monitoring Recommendation
<1.5x baseline	Increase infusion by 20%	Recheck PTT 2 hrs after rate change
1.5 to 2.5 x baseline	Continue current rate	Recheck PTT in 2hrs; if within therapeutic range 2 consecutive times, check PTT every 12 hours.
>2.5 to 3 x baseline	Decrease infusion by 20%	Recheck PTT 2 hrs after rate change
>3 x baseline	Hold for 1 hour, then restart at 50% lower rate.	Recheck PTT 2 hrs after rate change

Transitioning Between Therapies

Fondaparinux to warfarin[2,15]

- Once platelet count normalizes, start warfarin 5mg daily (*UW Health low quality of evidence, strong recommendation*)
- Dose adjust warfarin until the INR is ≥2. When INR is within a therapeutic range for two consecutive results and after a minimum of 5 days, discontinue fondaparinux. (*UW Health low quality of evidence, strong recommendation*)

Argatroban to warfarin[2,3,11]

- Adjust infusion rate to achieve a PTT level above 1.5x normal before starting warfarin at 5mg daily. (*UW Health low quality of evidence, strong recommendation*)
- The combination of argatroban and warfarin creates a laboratory discrepancy which falsely elevates INR values. During the combination target an INR of ≥ 4.
- Once the INR is ≥ 4 and after a minimum of 5 days on dual anticoagulant therapy, argatroban can be held and the INR repeated in 4-6 hours. (*UW Health low quality of evidence, strong recommendation*)
- If the repeat INR off argatroban is sub-therapeutic, the infusion should be resumed at the previous rate and the procedure repeated daily until the INR on warfarin is therapeutic. When this occurs, argatroban can be discontinued. (*UW Health low quality of evidence, strong recommendation*)

Parenteral to DOAC[3,15-19]

- Fondaparinux: Stop fondaparinux and start DOAC at the time of the next scheduled fondaparinux dose. (*UW Health low quality of evidence, strong recommendation*)
- Argatroban: Stop argatroban infusion and start DOAC at the same time. (*UW Health low quality of evidence, strong recommendation*)

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