Heparin Induced Thrombocytopenia (HIT) Assessment

There are two forms of thrombocytopenia related to heparin exposure – non-immune and immune mediated. The immune mediated form can lead to thrombosis requiring the use of alternative therapies.

Types of Heparin Related Thrombocytopenia

	HAT* Non-immune Mediated	HIT Immune Mediated
Frequency	10-30%	<1-3%
Timing of Onset	1-4 days	Typical 5-10 days Acute (immediate with recent exposure) Delayed
Decrease in platelets	Slight	Moderate/large
Antibody Mediated	No	Yes
Thrombosis	No	30-75%
Hemorrhage	None	Rare
Management	Observe	Discontinue heparin or Low Molecular-Weight Heparin (LMWH) Start alternate anticoagulant

*Heparin associated thrombocytopenia

Immune-Mediated HIT

Immune mediated heparin induced thrombocytopenia is a rare consequence from exposure to heparin or LMWH products. If not recognized, HIT can lead to thrombosis, limb amputation, or even death. If HIT is suspected, the following should be considered:

- Did the platelet count drop by 50% from the pre-heparin baseline?
- Is there is a recent documentation of HIT?
- Did a new spontaneous arterial or venous thrombosis occur during heparin or LMWH therapy?

Table 15-7: Pretest Probability Scoring (4Ts) for HIT

Indicator	2 Points	1 Point	No Points
Thrombocytopenia Compare the highest platelet count within the sequence of declining platelet counts with the lowest count to determine the percent of platelet fall. (Select only 1 option)	>50% fall and platelet nadir ≥ 20 K/mm^2 *and no surgery within preceding 3 days*	• 50% platelet fall but surgery within preceding 3 days OR • Any combination of platelet fall and nadir that does not fit criteria for Score 2 or Score 0 (e.g. 30% to 50% fall, or platelet nadir 10–19 K/mm^2)	• <30% fall • platelet nadir <10 K/mm^2
Timing of platelet count fall or other sequelae* Day 0 = first day of most recent heparin exposure. (Select only 1 option)	• Clear onset 5–10 days after exposure to heparin • Platelet fall within 1 day of start of heparin and exposure to heparin within past 5 – 30 days	• Consistent with platelet fall day 5-10 but not clear (e.g. missing counts) • Platelet fall within 1 day of start of heparin and exposure to heparin in past 31-100 days • Platelet fall after 10 days.	Platelet count fall ≤day 4 without exposure to heparin past 100 days.
Thrombosis or other sequelae (Select only 1 option)	• Confirmed new thromboses (Venous or arterial) • Skin Necrosis at Injection site • Anaphylactic Reaction to IV heparin bolus • Adrenal Hemorrhage	• Recurrent venous thrombosis in a patient receiving therapeutic anticoagulants • Suspected thrombosis (awaiting confirmation with imaging) • Erythematous skin lesions at heparin injection sites.	No related thrombosis suspected
Other causes of thrombocytopenia** (Select only 1 option)	No other cause for platelet count fall evident	• Possible causes evident. Sepsis without proved microbial source • Thrombocytopenia associated with initiation of ventilator.	Definite other causes present • Within 72 hours of surgery • Confirmed Bacteremia/fungemia • Chemotherapy or radiation within past 20 days • DIC due to non-HIT cause • Post transfusion purpura (PTP) • Thrombotic thrombocytopenic purpura (TTP) • Platelet count <20 AND given a drug implicated in causing D-ITP (see list) • *Non-necrotizing skin lesions at LMWH injection sites (presumed DTH)*

Pretest Probability	
6–8	High
4–5	Intermediate
0–3[b]	Low

[a]4 Ts = **T**hrombocytopenia, **T**iming, **T**hrombosis, O**t**her.

Reference: Linkins LA, Dans AL, Moores LK et al. Treatment and prevention of heparin-induced thrombocytopenia: antithrombotic therapy and prevention of thrombosis, 9th ed. Chest. 2012;141:e495s-e530s

Probability Scoring In the Setting of Cardiopulmonary Bypass (CPB) Surgery

Variable	Score
Platelet Count time course	
- Initial platelet count drop and full recovery over > 5 days with a notable subsequent drop in the next few days	**2**
- Initial platelet count drop and small recovery in ~ 2 days followed by a subsequent decline over the next few days	**1**
Time from CPB to assessment day	
- ≥ 5 days	**2**
- < 5 days	**0**
CPB duration	
- ≥ 118 min	**1**
- < 118 min	**0**
Classification	**Total Score**
- High Probability of HIT	**≥ 2**
- Low probability of HIT	**< 2**

Reference: Lillo-Le Louet A. J Thromb Haemost 2004;2:1882-8

Onset of HIT

Three different onset patterns for HIT have been reported:

Rapid HIT	An immediate (hours) reaction can occur in patients recently exposed to heparin (within past 100 days)
Typical HIT	4-11 days after initial exposure to heparin
Delayed HIT	Up to 40 days after last exposure to heparin

Consider checking a platelet count on all admissions for newly diagnosed thrombosis in patients who have recently been exposed to heparin or LMWH therapy. If there is previous documentation of HIT, review records available to assess the basis of the diagnosis and history of any assays for HIT antibody.

Clinical Presentations of HIT

Management approaches may differ depending on the presentation of HIT.

Acute HIT: The initial period of thrombocytopenia associated with current or recent exposure to heparin prior to platelet count recovery

Once identified, an alternative anticoagulant agent should be initiated unless the physician determines that the risk for a bleeding complication is too high to initiate an alternative anticoagulant.

Isolated HIT: The occurrence of HIT without thrombosis related to HIT. The duration of anticoagulation may depend on the risk for acute thrombosis as well as the presence of pre-existing thrombosis prior to heparin exposure or other indications for continued anticoagulation.

HIT related thrombosis syndrome (HITTS): The occurrence of thrombosis attributed to HIT

Due to the presence of thrombosis, anticoagulant therapy is recommended for at least 3 to 6 months.

History of HIT: Has a history of HIT but thrombocytopenia currently not present. If a need for anticoagulation occurs, alternative agents may be considered.
Note: The incidence of HIT recurrence in those with a history of HIT may diminish with time (e.g. > 100 days), and depending on the situation, clinicians may consider heparin use.

Testing for HIT
At UC Davis, the clinical laboratory offers the HIT ELISA test to detect presence of antibodies. The Serotonin Release Assay (SRA) is a send-out and may take several days to be reported (see UCDMC Primary Decision Support Tool for Suspected Heparin-Induced Thrombocytopenia). These assays should be considered only when there is sufficient clinical suspicion for HIT (e.g. 4T score > 3) and not as a routine work-up process for thrombocytopenia in general. Once the assay is ordered, "Suspected HIT" should be added to the patient's problem list in EMR. When the physician determines the patient does not have HIT, then the "Suspected HIT" entry should be removed from the patient's problem list.

Pharmacologic Management:

1. Stop all heparin exposure.
Heparin can be present in arterial lines flushes and should be avoided/replaced with non-heparin products if possible.

2. Initiate an alternative anticoagulant (direct thrombin inhibitor or fondaparinux).
Stopping all heparin/LMWH alone does not prevent the progression of the syndrome. The use of direct newer oral anticoagulants for management of HIT has not been determined. For dosing assistance of direct thrombin inhibitors, call pharmacy at 762-CLOT (2568).

3. After initiation of an alternative agent, warfarin can be used in addition to the other agent once the platelet count is recovering.
The alternative anticoagulant should not be discontinued until the INR reaches a target of 2-3 (adjusted for false positive results with direct thrombin inhibitors).

Approved by UCDHS Pharmacy and Therapeutics Committee 5/2017.