

بنام حضرت داوود جان و



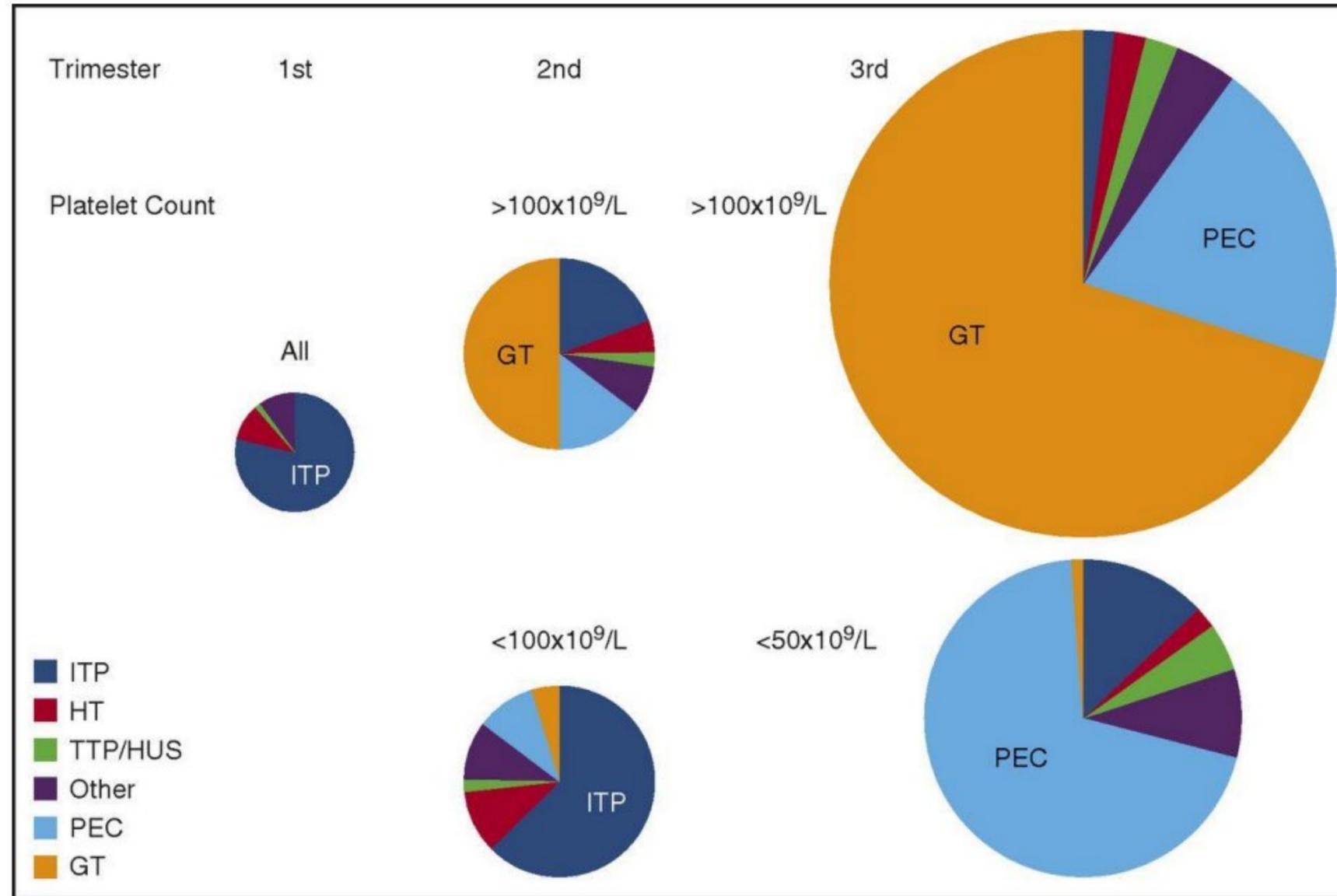
Laboratory Diagnosis of Thrombocytopenia in obstetrics

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Thrombocytopenia in pregnancy



Douglas B. Cines, Lisa D. Levine, Thrombocytopenia in pregnancy, *Blood*, 2017, Figure 1.

Differential diagnosis of thrombocytopenia in pregnancy

	Pregnancy specific	Not pregnancy-specific
Isolated thrombocytopenia	<ul style="list-style-type: none"> Gestational thrombocytopenia 	<ul style="list-style-type: none"> ITP Secondary ITP Medication therapy/drugs Type 2B von Willebrand disease Congenital thrombocytopenia
Thrombocytopenia associated with systemic disorders	<ul style="list-style-type: none"> Pre-eclampsia HELLP* syndrome Acute fatty liver of pregnancy 	<ul style="list-style-type: none"> TTP/HUS[†] Systemic lupus erythematosus (SLE) APLS[‡] Viral infections (HIV, HBV etc) Bone marrow disorders Nutritional deficiency Splenic sequestration

Gestational Thrombocytopenia

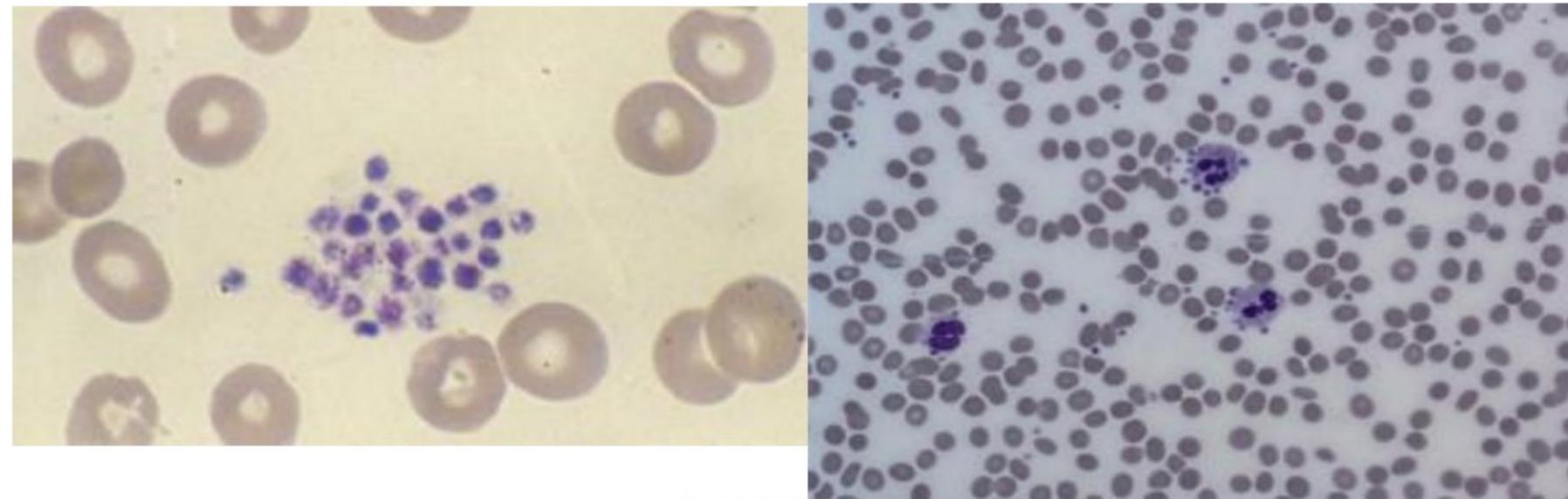
	Pregnancy specific
Isolated thrombocytopenia	<ul style="list-style-type: none">• Gestational thrombocytopenia

- There is **no specific laboratory test** to confirm the diagnosis
- Gestational thrombocytopenia is a **diagnosis of exclusion**

Pseudothrombocytopenia

- Relatively **uncommon** phenomenon
- The number of platelets reported by **automated cell counters** is much lower than the real number of platelets circulating *in vivo*.
- **Erroneous diagnosis of thrombocytopenia**

platelet clumping



in vitro, may be induced either by

- (a) antibody-mediated **agglutination**, the most important causes of which are **(EDTA)-dependent** agglutination¹ and platelet satellitism,² or
- (b) aggregation secondary to **platelet activation** resulting from improper **blood sampling** techniques or delayed mixing with **anticoagulant** in the test tubes

Immune Thrombocytopenia

Immune thrombocytopenia (ITP), previously called idiopathic thrombocytopenic purpura, is an **acquired autoimmune disorder** characterized by the destruction of platelets and megakaryocytes, resulting in thrombocytopenia (**platelet count $<100 \times 10^9/L$**).

ITP accounts for approximately **3%** of all cases of thrombocytopenia in pregnancy, but is the **most common cause of a platelet count less than $50 \times 10^9/L$** in the **first or second trimesters**

	Pregnancy specific	Not pregnancy-specific
Isolated thrombocytopenia		<ul style="list-style-type: none">• ITP
	<ul style="list-style-type: none">• There is <u>no specific laboratory test</u> to confirm the diagnosis• ITP is a <u>diagnosis of exclusion</u> though the diagnosis• <u>Supported by one or more of the followings:</u><ol style="list-style-type: none">1. Severe thrombocytopenia (platelets $<50 \times 10^9/L$) with normal blood film.2. Steroid responsiveness3. Positive autoimmune serology	

Secondary ITP occurs in approximately 20% of patients with ITP

	Pregnancy specific	Not pregnancy-specific
Isolated thrombocytopenia	<ul style="list-style-type: none">Gestational thrombocytopenia	<ul style="list-style-type: none">ITPSecondary ITPMedication therapy/drugsType 2B von Willebrand diseaseCongenital thrombocytopenia

Definition: **Thrombocytopenia associated with other diseases** such as chronic infections, lymphoproliferative disorders such as chronic lymphocytic leukemia (CLL), other autoimmune disorders as SLE, rheumatoid arthritis (RA) and APLA syndrome

Drug-induced thrombocytopenia

	Pregnancy specific	Not pregnancy-specific
Isolated thrombocytopenia	<ul style="list-style-type: none">Gestational thrombocytopenia	<ul style="list-style-type: none">ITPSecondary ITPMedication therapy/drugsType 2B von Willebrand diseaseCongenital thrombocytopenia

Immune Drug-induced **immune** thrombocytopenia



Heparin-induced thrombocytopenia

Non-immune

- Chemotherapy
- Furosemide
- Gold, used to treat arthritis
- Nonsteroidal anti-inflammatory drugs (NSAIDs)
- Penicillin
- Quinidine
- Quinine
- Ranitidine
- Sulfonamides
- Linezolid and other antibiotics
- Statins

Heparin-induced thrombocytopenia

Heparin-induced thrombocytopenia (HIT)

Definition: An immune-mediated adverse drug event to heparin that results in **thrombocytopenia** and potentially **catastrophic thrombosis**.

This illustrated review will discuss the **diagnosis and management** of HIT, highlighting connections between **Pathophysiology** and clinical care, and emphasizing central **Pitfalls** and **Pearls** to encourage evidence-based care.

Incidence

↑ incidence with **major surgery**, particularly cardiac²

1 in 1500 hospitalizations¹ in the United States

↑ incidence with **unfractionated heparin** (3%) vs. low molecular weight (<1%)^{3,4}

↓ incidence with **shorter duration of exposure** to heparin, specifically <5 days⁵

Clinical manifestations & outcomes¹

Compared to hospital discharges without HIT



↓ *Single institution reports⁹*

ratio Venous:Arterial 1:1 to 4:1	3-8%	6-50%
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Rare manifestations

Disseminated intravascular coagulation (DIC)¹⁰

Injection site necrotizing skin lesions¹¹

Anaphylactoid reactions to IV heparin bolus¹¹

aOR, adjusted odds ratio; CI, confidence interval

Five platelet-activating anti-PF4 disorders

