

PHYSICIAN UPDATE

Immature Platelet Fraction (IPF) Test

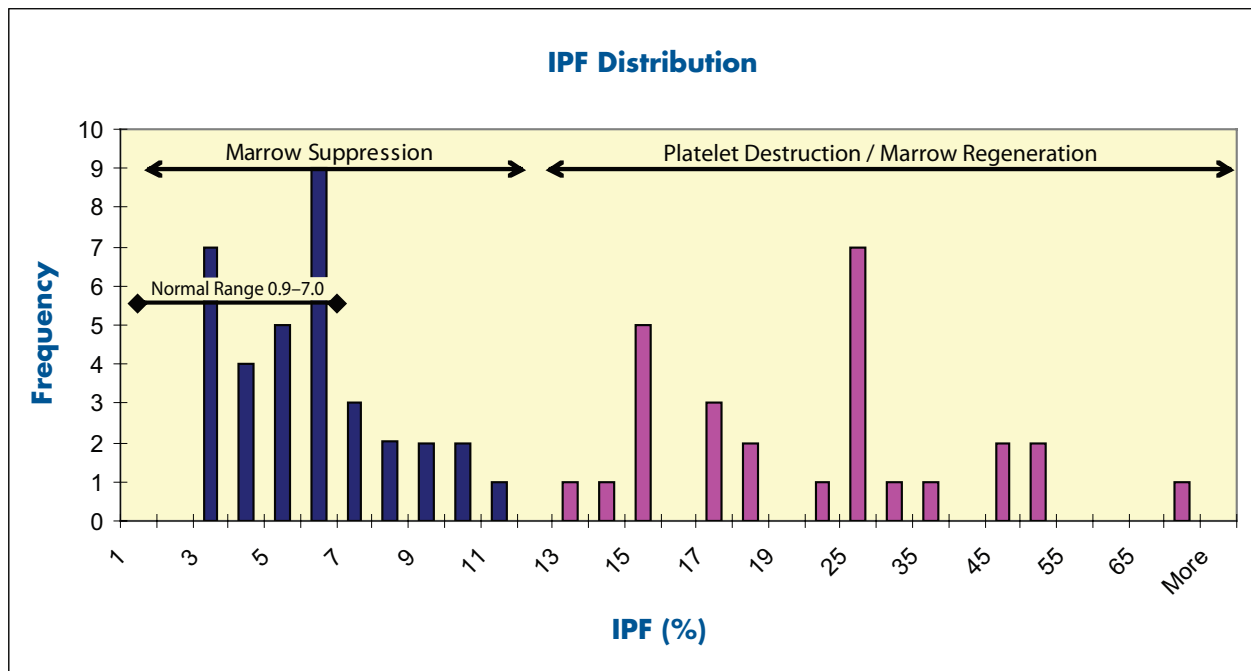
BENEFITS

- Used to evaluate low platelet counts
- IPF differentiates increased platelet consumption from bone marrow failure/suppression in most cases
- Available at low cost with rapid turnaround time
- May eliminate the need for bone marrow examination in some patients, such as younger patients with high immature platelet fraction (IPF) and clinical presentations suggesting idiopathic thrombocytopenic purpura (ITP)

SUMMARY

This inexpensive test for rapid assessment of immature platelet function (IPF), may be useful to evaluate patients with thrombocytopenia.

IPF is the platelet equivalent of the red blood cells reticulocyte count and is typically elevated in disorders of platelet destruction such as idiopathic thrombocytopenic purpura (ITP), thrombotic thrombocytopenic purpura (TTP) and disseminated intravascular coagulation (DIC). It is also an early indicator of marrow recovery in post-chemotherapy and stem cell transplant patients. IPF is normal or minimally elevated in marrow suppression disorders such as aplastic anemia and in liver failure. IPF can be elevated in a subset (24%) of myelodysplasia patients.



Marrow suppression: Liver failure/hepatitis C, kidney failure, acute leukemia, myelodysplasia, chemotherapy, hypothyroidism. PLT Destruction: ITP, DIC, TTP

continued on next page

Immature Platelet Fraction (IPF) Test (Continued)

DIAGNOSTIC UTILITY OF IPF

Studies by PeaceHealth Laboratories demonstrated good performance of IPF in differentiating thrombocytopenia due to consumptive processes such as ITP from non-regenerative processes (aplasia, myelodysplasia, etc). A normal study (n=100) resulted in an IPF reference range of 0.9-7.0%, which is similar to ranges reported by other laboratories.

Testing on ITP patients demonstrated consistent IPF elevations, typically >10%, with normal or near normal results in patients with marrow suppression (see chart on page 1). Borderline elevations may occur with liver cirrhosis, presumably due to the mixed etiology of low platelet count in these cases involving both increased platelet production and decreased hepatic thrombopoietin production.

IPF IN THE LITERATURE

Patients with ITP had the highest IPF levels of all patients in a 2004 study,¹ with 73% of ITP patients showing elevated levels (mean 22.3%, range 9.2-33.1%), and 100% of patients with PLT CT <50 K/uL showing elevated IPF levels. TTP patients also showed high IPF levels (mean 17.2%, range 11.2-30.9%). Levels were not elevated in patients on chemotherapy or in ITP/TTP patients in remission.

In other research, patients with IPF values >9.0% were 100% specific for peripheral platelet destruction, with 89% sensitivity for ITP.²

Studies have also shown that IPF is an early indicator of marrow recovery in patients rebounding from chemotherapy or hematopoietic stem cell transplant. IPF recovery defined as levels >7.0% occur on average 3.1 days earlier than platelet count recovery, and 3.8 days earlier than absolute neutrophil count recovery. Thus IPF may be useful to guide and possibly limit prophylactic platelet transfusions in patients undergoing marrow suppressive therapy, in view of imminent recovery of the platelet count.^{3,4}

A study of IPF in 51 myelodysplasia (MDS) patients showed that most had normal IPF levels (mean 5.3%); however a subset (24% of patients) had IPF levels above 10%.

All MDS patients with PLT CTs >50K/uL and elevated IPF showed chromosome 7 abnormalities with cytogenetic studies, indicating that elevated IPF in MDS patients without marked thrombocytopenia may be a marker for karyotypic abnormalities with poor prognosis.⁵

METHODOLOGY

IPF is determined on a standard automated hematology instrument using flow cytometry technology to detect RNA dye-binding in immature platelets. IPF is an FDA-approved parameter, and is available at any day or hour with turnaround time similar to a complete blood count (CBC). Testing can be performed on as little as 0.5 mL of blood.

QUESTIONS?

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continued on back

Immature Platelet Fraction (IPF) Test (Continued)

ORDERING INFORMATION

20182	Immature Platelet Fraction (IPF)
Methodology:	Automated hematology analyzer using fluorescent flow cytometry
Performed:	Daily
Released:	Same day as tested
CPT Code:	85055 (per assay)

SPECIMEN REQUIREMENTS:

Collect:	One 4 mL lavender top tube (EDTA)
Handling:	Send to the laboratory within 24 hours, ambient (preferred) or refrigerated. Do not freeze.
Stability:	Unstable frozen
Standard Volume:	4 mL EDTA whole blood
Minimum Volume:	0.5 mL EDTA whole blood in a 1.0 mL micro-collection tube
Transport:	Ambient (preferred) or refrigerated
Rejection Criteria:	Gross hemolysis, clotted or frozen specimen, delayed transport
Comments:	For use in evaluation of thrombocytopenia, with elevated levels seen in consumptive processes such as ITP, TTP and DIC