# UTILITY OF
# IMMATURE PLATELET FRACTION (IPF)
# TO PREDICT
# PLATELET RECOVERY IN DENGUE PATIENTS
# HAVING THROMBOCYTOPENIA

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# Introduction

- Thrombocytopenia is a feature of a lot of diseases including viral infections like dengue
- Monitoring platelet count is critical in the management of dengue as fall in platelet count may necessitate transfusions
- Recovery is heralded by an increase in the number of platelets
- Both doctor and patient anxiously await an increase in platelet count.

- Is there a way to monitor when the platelets would increase ?
- Is there a way of predicting recovery ?
- Can unnecessary transfusions be avoided ?

# Immature Platelet Fraction (IPF)

- Recently introduced parameter in certain cell counters (Sysmex and CELL DYN Abbott)
- IPF is an index of thrombopoiesis which quantitates reticulated ( young)platelets
- Analogous to reticulocytes
- The RNA of these platelets can be accurately quantitated by flow cytometry using a fluorescent dye like oxazine
- IPF is already being used in many institutions over the world to monitor cases of ITP, TTP and Marrow transplant to accurately predict recovery from thrombocytopenia.

# Aims and Objectives

**Aim of the Current Study**

- Evaluate and use the quantification of reticulated platelets and IPF to predict recovery in cases of thrombocytopenia arising due to platelet destruction seen in cases of Dengue

- Compare our finding with the only other study available ( Dadu, et al )

# Methodology

1. Established the range of IPF in individuals with normal platelet counts in our setup by studying 100 cases

- Normal range : 1.0 to 9.0%
- Mean : 4.0%
- Standard deviation : 1.84

2. Selection of Cases for the Current Study

| | | |
|---|---|---|
| Number of cases fulfilling inclusion criteria | Patients with a positive dengue test ( IgM or NS1 with or without IgG positivity)<br>..AND..<br>Platelet count < 1 lakh / cumm | 56 |
| Number of cases fulfilling exclusion criteria | Dengue serology (IgG positive) | 7 |
| | Dengue cases Platelet count >1 lakh/cumm | 11 |

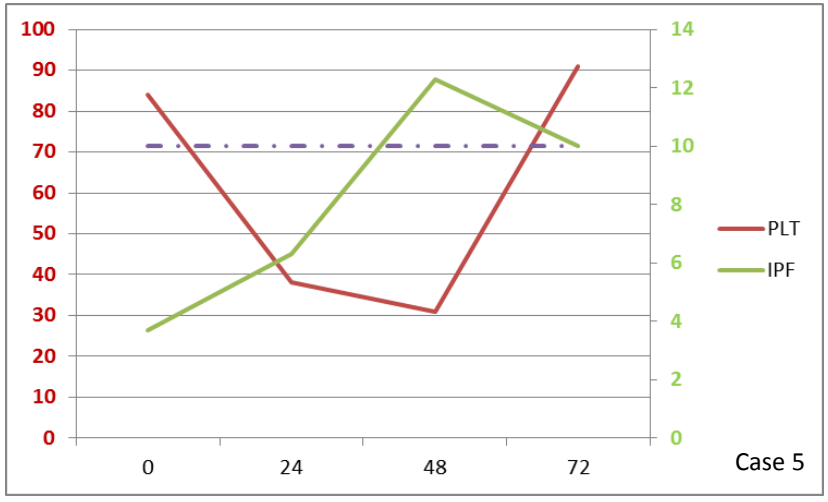
# Methodology

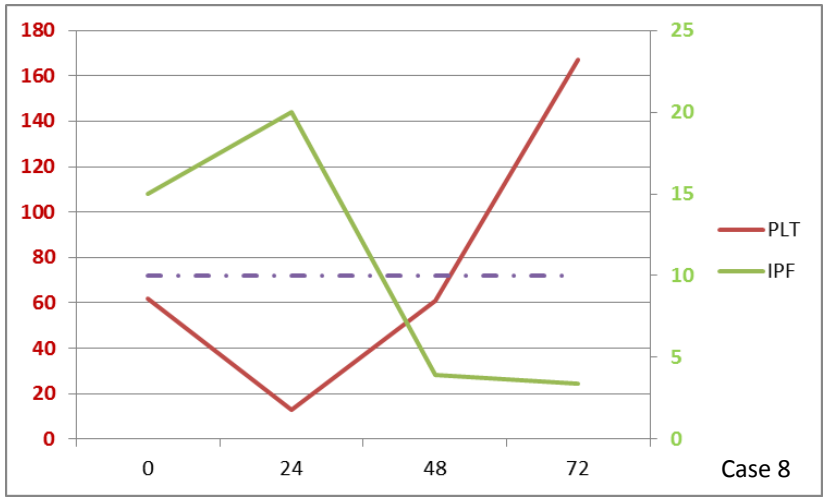
- Dengue serology was recorded by doing ELISA test using Euroimmune system; with kits from PANBIO (NS1 Antigen) and Euroimmune (IgG and IgM)
- These patients had follow-up at intervals ranging from 24 to 72 hours with at least two platelet count readings
- The platelet count and immature platelet fraction was estimated using the fluorescent dye binding of platelet RNA on the SYSMEX XN 1000 by flow cytometry ( Oxazine dye 0.003%) on the PLT channel. CBC was recorded simultaneously
- Peripheral smears were studied in all these cases with a note on the presence of large platelets on smear

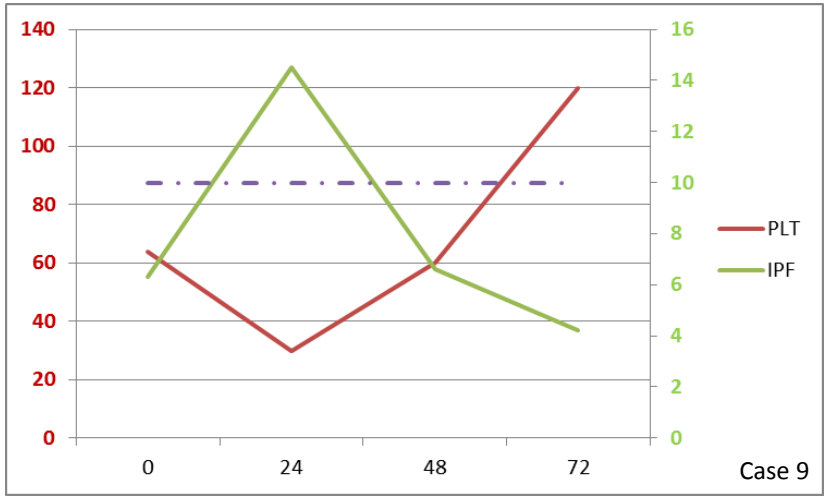
| | #readings | #cases |
|---|---|---|
| upto 72 hrs | 4 | 8 |
| upto 48 hrs | 3 | 34 |
| upto 24 hrs | 2 | 14 |
| | TOTAL | 56 |

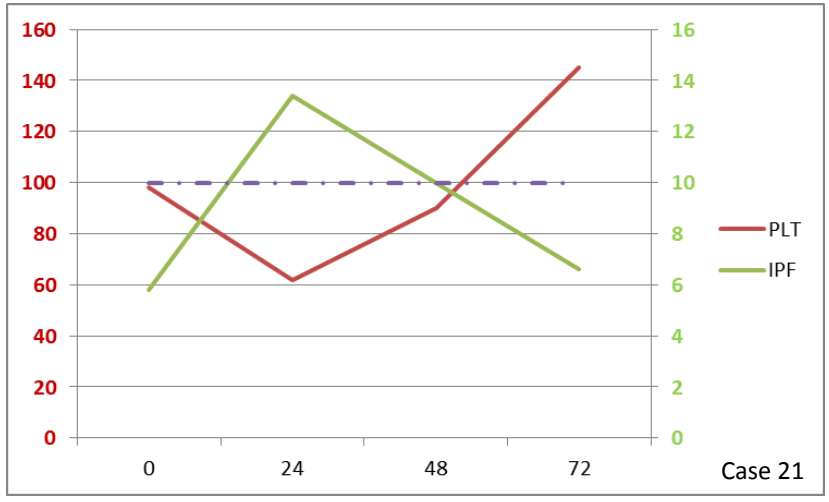
# Observations

Sample : cases with 4 readings



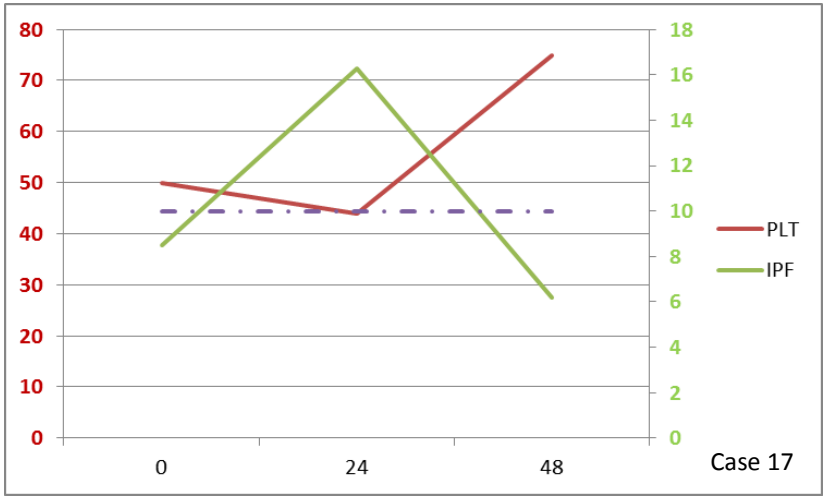



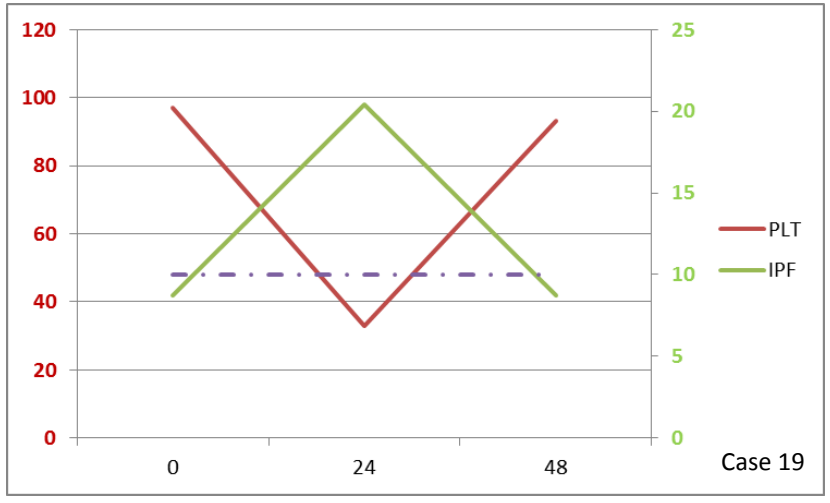



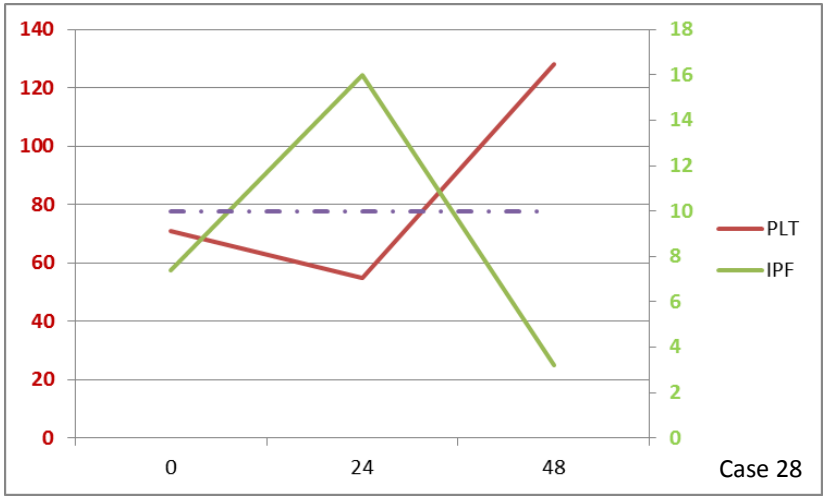

Platelet counts started rising after the IPF touched 10.0% with a quick recovery from a falling trend

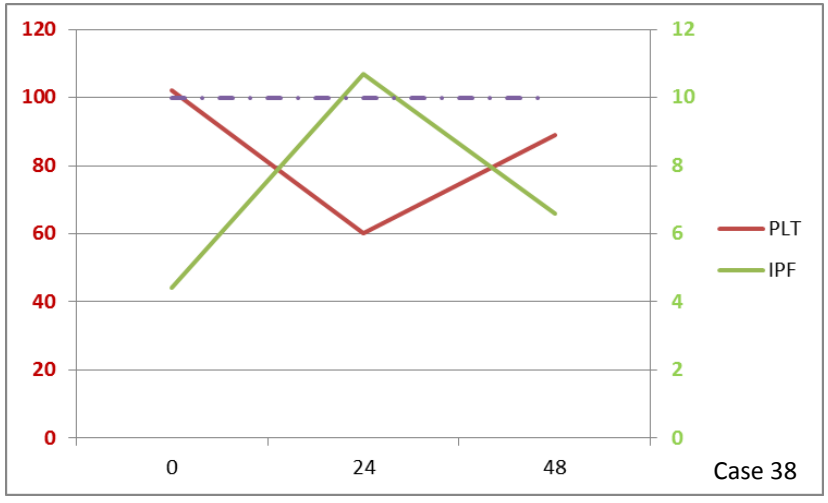
# Observations

Sample : cases with 3 readings



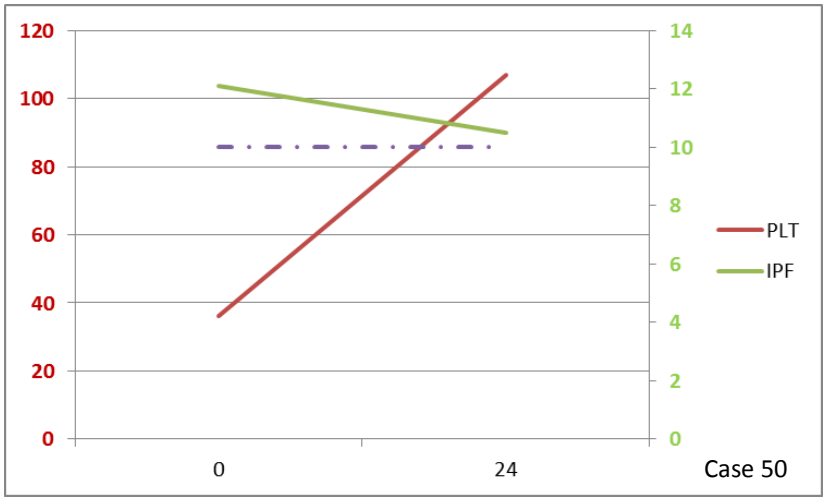



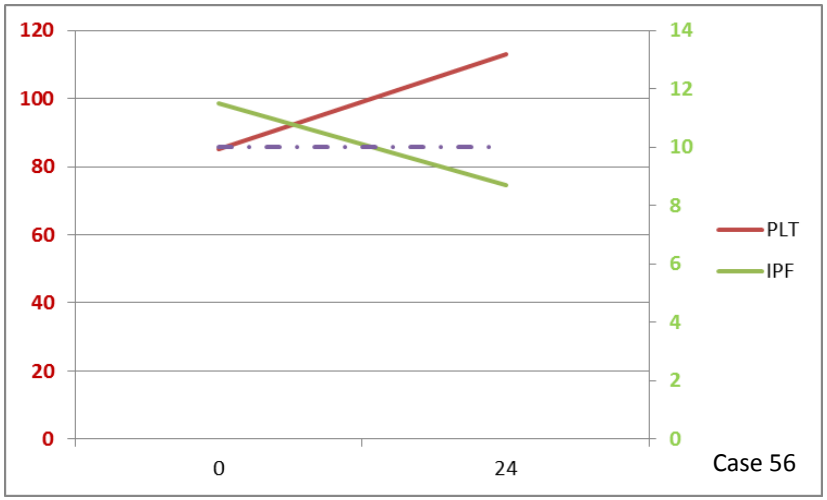



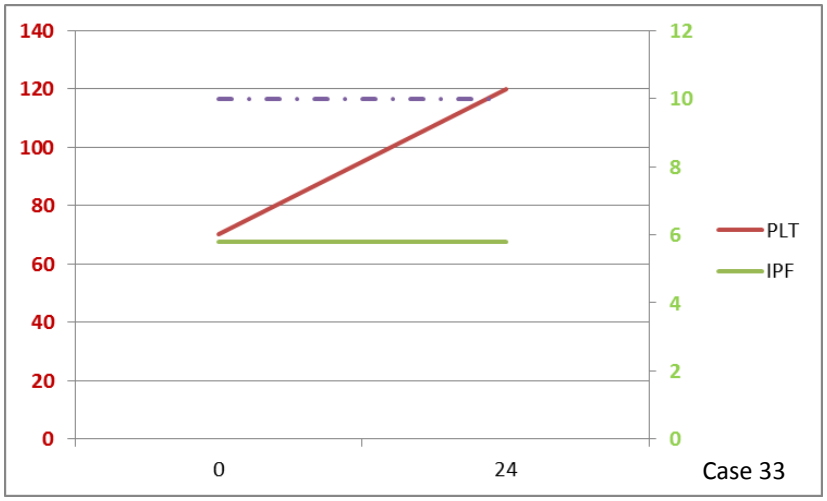

Platelet counts started rising after the IPF touched 10.0% with a quick recovery from a falling trend

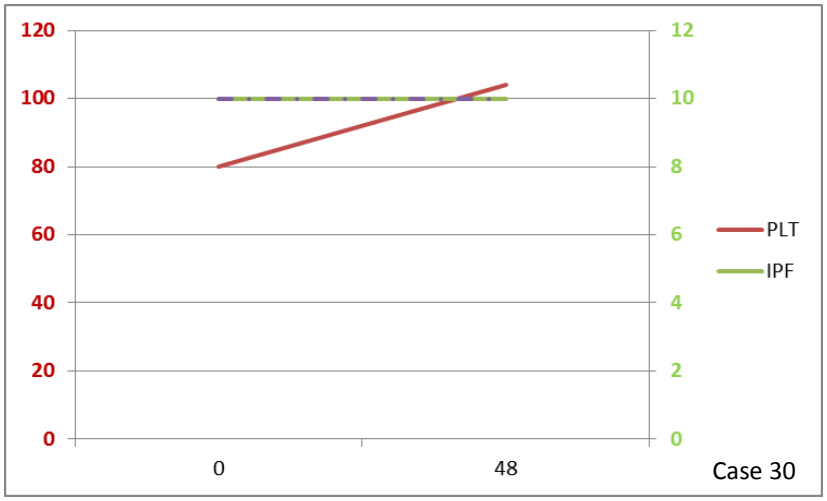
# Observations

Sample : cases with 2 readings



# Results and Discussion

| | | Current study | Dadu et al |
|---|---|---|---|
| Inclusion criteria | | Similar | Similar |
| Instrument | | Sysmex XN 1000 | Sysmex XE-2100 |
| Number of Cases | | 56 cases | 32 cases |
| | | | |
| Recovery from falling trend | Within 24 hours | 92.80% | 100% |
| | Within 24-48 hours | 7.20% | 0.00% |
| | | | |
| Recovery from peak | Same day | 46.40% | 18.79% |
| | Within 24 hours | 94.60% | 84.30% |
| | Within 24-48 hours | 100% | 100% |
| | | | |

# Conclusion

- IPF shows a strong co-relation  with a recovery of platelet counts in patients with dengue infections
- IPF can be used confidently to predict recovery of platelets in patients of dengue
- An IPF value of more than 10.0% indicates recovery of platelet count within 48 hours

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# THANK YOU

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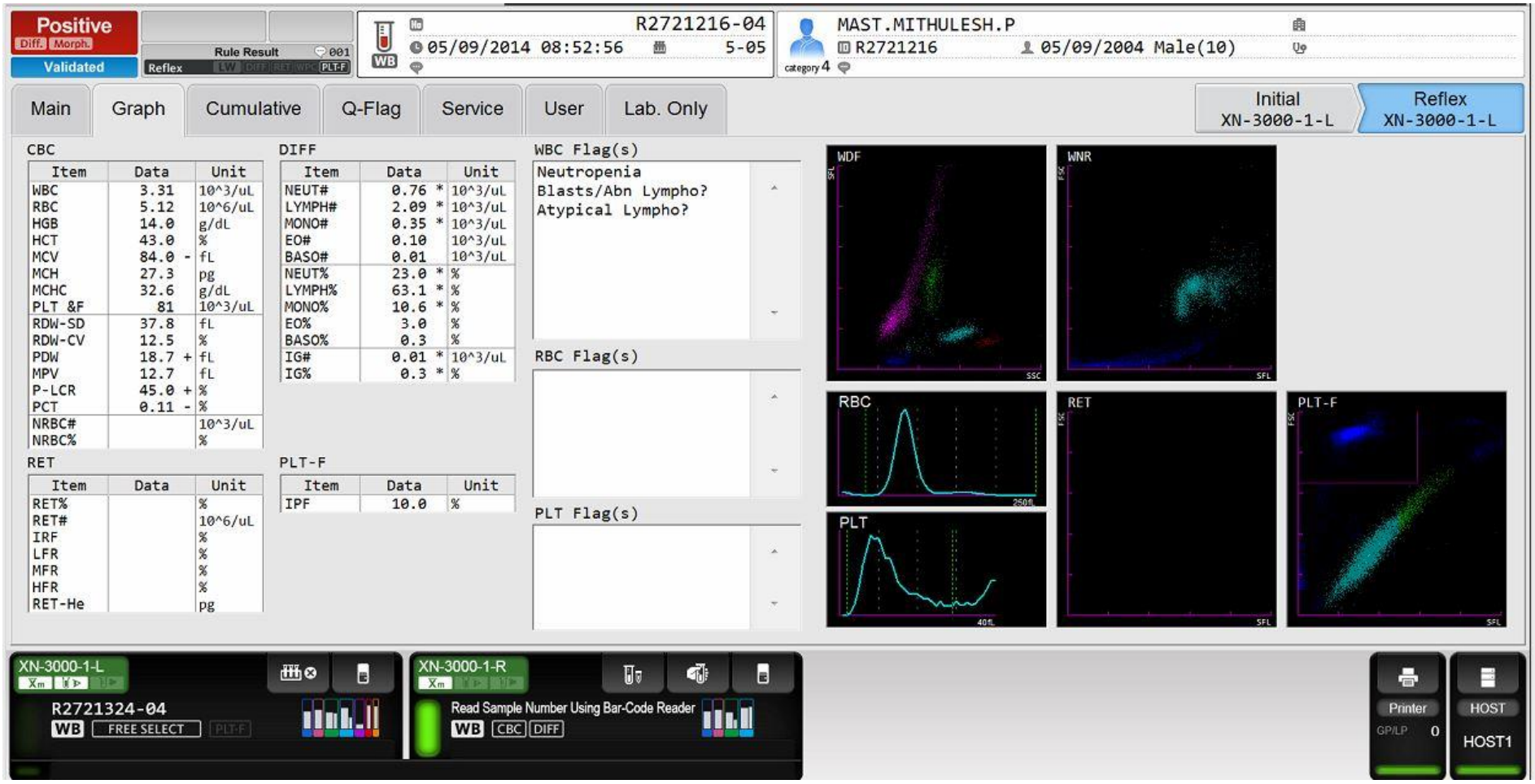
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