

Nucleic Acid Testing: Experience at a Standalone South Indian Blood Centre

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Background

- Blood safety remains a critical priority in transfusion medicine, particularly in the prevention of Transfusion-Transmissible Infections (TTIs). Advanced molecular diagnostic tools (like the Cobas MPX 5800 system), which utilizes Nucleic Acid Testing (NAT), have significantly transformed blood screening processes.
- NAT allows for the early detection of viral and bacterial pathogens by identifying the presence of their genetic material (DNA/RNA), thereby reducing the window period of their detection.
- Using the minipool strategy, this system offers a highly efficient and cost-effective solution for screening large volumes of blood donations.
- This is a report of an experience of establishing NAT testing in our own centre after using extramural testing facilities over several years.

Methods

- *Hemilton-Microlab STARlet* is used for Automated sample pipetting and pooling. Each pool has 6 samples.
 - After pooling is done, the pooling tube racks are transferred to Cobas rack and loaded.
 - NAT testing –The plasma samples were processed according to the manufacture's instructions , applying the plasma minipool (MP-NAT) Protocol in the fully automated system.
 - Once the process finishes in cobas 5800, the result will be automatically released to cobas synergy .
 - As per institutional protocol, *all chemiluminescent (CLIA) negative samples* were routinely tested by minipool NAT (Cobas 5800, Roche Diagnostics). Additionally, for HBV and HCV, donors with *CLIA S/Co value > institutional cut-off (IC)* were also tested by NAT to streamline the counseling process.
- If even 1 sample in the pool is reactive for 1 viral marker, the entire pool is designated as reactive. Each individual sample in the pool is then tested individually for the viral markers.*
- All HIV sero-reactive samples were tested by NAT irrespective of their S/CO cut-offs.*
- The data provided is of 5 months (May-October 2024) .

Results

- Institutional IC: HCV-10, HBV- 1400. Decided by analysis of previous data over 2 years.
- Total donors tested during study period: 12228
- CLIA non-reactive for TTIs: 12077
- NAT testing done for: 12112
- Concordant: 12109
- NAT yield: 3 (all HBV).

Conclusion

- Addition of NAT to routine screening can be a valuable tool in ensuring blood safety and efficient donor counseling.

Key Features of Cobas 5800 for Minipool NAT Testing

- ✓ High Sensitivity and Specificity
- ✓ Automated Workflow
- ✓ High Throughput
- ✓ Cost-Effectiveness
- ✓ Accurate Results in Less Time

