

# Let's have better blood screening test

Nucleic Acid Testing reduces the window period between initial infection and detection of antibodies

Zubeda Hamid | ENS  
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WHEN T Shyam (name changed) needed blood for his father's surgery, the young media instructor was desperate to get it very fast. But amid the flurry of organising donors, the question uppermost in his mind was: how safe is this blood?

It is with the mission to increase blood safety that doctors are now calling for nucleic acid testing (NAT) to be brought into screen blood. NAT is currently the most sensitive form of testing available and is already in use by several countries worldwide. It tests the DNA or RNA of the blood as opposed to testing antibodies or antigens, which the tests currently in use do.

"Even though we compulsorily screen blood for Hepatitis B (HBC), Hepatitis C (HCV) and HIV, there is still a window period during which viruses, if any in the blood, do not show up. So if a unit of donated blood is infected with a virus but still in the window period, the test will show the blood is safe. This then has the

potential to infect the person it goes to," said Dr P Srinivasan, chairman, Jeevan Blood Bank and Research Centre, which now conducts NAT testing.

With NAT, this window period is considerably reduced. For Hepatitis C the period is reduced from 65 days to three days – that means the virus can be detected in the blood just three days after infection. With HIV, the window period is reduced from 21 days to six days and for Hepatitis B from 36 days to 15.

Dr Ravi Reddy of the South African National Blood Services, who was in the city recently, underlined the importance of NAT testing.

"In the eight years before we brought in NAT testing, we had 11 confirmed cases of HIV transmission through a blood transfusion. After NAT, we haven't had a single case," he said.

In studies conducted in seven hospitals across the country in 2006, blood that had already been screened through hospital tests was tested once again using NAT. The authors found a 'yield' or result of one HIV, six HBV and one HIV-HCV co-

infection from among 12,224 samples.

"Though the numbers may be small, it is important to realise that 90 per cent of all blood is converted into components. Which means, that one unit of infected blood could potentially go out to four patients translating into hundreds of cases per year," said Dr Saranya Narayan, medical director at Jeevan Blood Bank.

With close to 11 per 1,000 people being positive for Hepatitis B and almost two per 1,000 for HIV in the country, experts estimate that NAT testing could give large results. "Potentially, one in 5,000 samples could be positive for Hepatitis B and one in approximately 15,000 for the other two through NAT," Dr Srinivasan said.

At present, NAT testing is not performed by government hospitals, partly because of the cost of the equipment, which is quoted around Rs 40 lakh. With the number of units of blood donated every year in the State at over two and a half lakhs, and the demand is almost three times more, doctors now say that bringing in NAT is essential to enhance blood safety.

## Frequently asked questions

### 1. WHAT IS NUCLEIC ACID AMPLIFICATION TESTING?

Nucleic Acid Amplification Testing (NAT) is a highly-sensitive method of testing blood that is used to detect Hepatitis C virus (HCV), Human Immunodeficiency Virus (HIV-1) and West Nile Virus in blood. Most traditional screening tests require the presence of antibodies to trigger a positive test reaction. The period of time between initial infection and detection of antibodies is called the window period. NAT reduces the window period by detecting low levels of viral genetic materials that are present soon after infection but before the body has had a chance to start producing antibodies.

### BY HOW MANY DAYS IS THE WINDOW PERIOD REDUCED?

NAT reduces identification of Hepatitis C infection in blood from 65 days to three days and HIV from 21 days to 6 days. It can detect more infectious donations than current tests because it detects viral genes rather than antibodies or antigens (proteins from the virus).

### 2. HOW DOES NAT WORK?

NAT testing begins with a number of blood samples being 'pooled' together in the laboratory. If the result of a pool of samples is negative, all samples in the pool are negative. If the pool is positive, then the samples are tested in smaller pools and then individually until the actual positive sample is identified.

### 3. CAN NAT REPLACE THE PREVIOUS ANTIBODY TESTS?

NAT is used in addition to antibody tests. Some individuals infected with Hepatitis C or HIV may be NAT-negative if the amount of virus present has fallen below detectable levels. In such cases antibodies to the virus would still be detected by current tests for hepatitis C or HIV-1.

### WHERE CAN I GO FOR A NAT TEST?

Very few places in the country. In the US, it has been on since 2001.