

THE PATHCARE NEWS

TESTING FOR HEPATITIS B VIRUS: INFORMATION FOR RENAL UNITS

Background:

Worldwide, approximately 250 million people are chronically infected with hepatitis B virus (HBV), with the prevalence in South Africa being approximately 7%.¹

HBV can be transmitted through perinatal transmission, horizontal transmission during childhood, percutaneous transmission, sexual exposure, or close person-to-person contact in the presence of open cuts and sores, as well as contaminated medical equipment ^{2,3}.

Outbreaks of HBV in renal units are still reported, and often there is evidence that these have been caused by lapses in high standards of infection control practice ⁴. The most important method of prevention of transmission of blood borne viruses is the rigorous application of universal infection control precautions. These include hygienic precautions that effectively prevent the transfer of blood or fluids contaminated with blood between patients either directly or via contaminated equipment or surfaces ⁴.

For patients infected with HBV, machine segregation (i.e. separate dialysis machines for HBV-infected patients) may be recommended. A machine that has been used for patients infected with HBV should only be used again for non-infected patients after it has been decontaminated ⁴.

To assist renal units with HBV infection control procedures, regular laboratory testing is paramount. Serologic testing for HBV is complicated by the fact that several different markers are available to test. It is therefore important that renal unit staff and clinicians ordering these tests have an understanding of the reason for ordering a specific marker, and the clinical significance of the results.

HBV serological testing options

The HBV serological markers that can be tested for include; hepatitis B surface antigen (HBsAg), hepatitis B core antibody (HBcAb), hepatitis B core IgM (HBcIgM), hepatitis B e-antigen (HBeAg), hepatitis B e-antibody (HBeAb) and hepatitis B surface antibody (HBsAb).

Detection of HBsAg with HBcAb confirms a current infection, whereas detection of HBsAb confirms immunity against future exposure.

Table 1 provides details of various HBV serological profiles and their clinical significance.

Table 1: Common HBV serological profiles and their clinical significance.

HBV serological markers						Interpretation
HBsAg	HBcAb	HBeAg	HBeAb	HBcIgM	HBsAb	
Positive	-	-	-	-	-	Current infection
Positive	Positive	-	-	-	Negative	Current infection
Positive	Positive	Positive	Negative	-	Negative	Current infection with high replication rate (as indicated by positive HBeAg)
Positive	Positive	Positive	Negative	Positive	Negative	Current infection, most likely recent infection (as indicated by positive HBcIgM and HBeAg)
Negative	Positive	-	-	-	Positive	Past, resolved infection
Negative	Negative	-	-	-	Positive	Immunity due to vaccination
Negative	Positive	-	-	-	Negative	Occult infection or previous resolved infection with loss of HBsAb or falsely reactive HBcAb. Requires HBV PCR or viral load to confirm

Typical medical aid/renal care organisations' guidelines for the testing of HBV in South Africa:

Table 2 provides information on typically allowed HBV laboratory tests, or guidelines from renal unit organisations. These guidelines are not necessarily universally applicable, and different renal units or medical aids may have different procedures and guidelines. This table merely serves as a guide to the rational use of HBV tests in the renal unit setting, which will allow for appropriate conclusions to be drawn regarding patients' HBV statuses. When the incorrect set of tests are ordered, it may not be possible to definitively assess whether patients are infected or not, or whether patients are immune or not. Hence the healthcare worker ordering these tests needs to be aware of the appropriate tests to order, and the interpretation of these results.

As an example, if the renal unit ordering these tests incorrectly omits HBsAg from their list of test requests, then it will be impossible to tell if a particular patient is infected or not. This omission is usually only realised later, delaying the results turn-around-time and necessitating either an after-request or an additional blood draw, often inconveniencing patients, clinicians, renal units and pathology personnel alike.

Please note that guidelines may change from time-to-time, and relevant up-to-date guidelines from specific medical aids or renal unit organizations should always be sought.

Table 2: HBV testing guide for dialysis patients ^{5,6}

Testing month	HBsAg	HBcAb	HBeAg	HBsAb
February (or first entry into dialysis unit)	✓	✓ *	✓ *	✓
August	✓	-	-	✓ **

* Only for patients with HBsAb levels ≤ 10 mIU/ml.

** if HBsAb level > 10 mIU/ml, repeat once a year.

Summary:

In South Africa, HBV monitoring of dialysis patients typically occurs twice a year (in January/February and July/August). These tests are often ordered by health care workers who do not have an in-depth knowledge of hepatitis B virus testing. This may lead to mistakes in the ordering of tests, which typically results in a delay in having the necessary test results to fully assess HBV infection and immunity. If these mistakes are not detected early, it may result in a delay in dialysis or negatively impact renal unit HBV infection control. Hence, an understanding of the different HBV tests available and the significance of the results is important in the ongoing effort of renal unit HBV infection control.

References:

1. Spearman CW. Demystifying the management of Hepatitis B – the WHO 2024 Guidelines on the management of Hepatitis B. South African Journal of Gastroenterology and Hepatology. 2024;01(1):19-21 <https://doi.org/10.36303/SAJGH.0497>
2. M.H. Nguyen, G. Wong, E. Gane, et al. Hepatitis B virus: advances in prevention, diagnosis, and therapy Clin Microbiol Rev, 33 (2) (2020), Article e00046-19.
3. Patel A, Dossaji, Gupta K, et al. The Epidemiology, Transmission, Genotypes, Replication, Serologic and Nucleic Acid Testing, Immunotolerance, and Reactivation of Hepatitis B Virus. Gastro Hep Advances. 2024; 3(2):139-150.
4. Garthwaite E, et al. Clinical Practice Guideline Management of Blood Borne Viruses within the Haemodialysis Unit. Renal Association Clinical Practice Guideline – Blood Borne Viruses – June 2019.
5. Discovery Health. Haemodialysis and peritoneal dialysis 2025. Chronic dialysis pathology basket of care.
6. National Renal Care Guidelines. 2025. Laboratory test protocol for patients on chronic dialysis.

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HBV PROTOCOLS FOR RENAL UNITS: A GUIDE TO INFECTION CONTROL & TESTING

BACKGROUND & TRANSMISSION

BACKGROUND



7%
**PREVALENCE IN
SOUTH AFRICA**

With roughly 250 million people infected globally, South Africa maintains a high prevalence rate, necessitating high vigilance in renal settings.

ROUTES OF TRANSMISSION



BLOOD



**PERCUTANEOUS
EXPOSURE**



**CONTAMINATED
MEDICAL
EQUIPMENT**



**CLOSE CONTACT
WITH OPEN
CUTS & SORES**

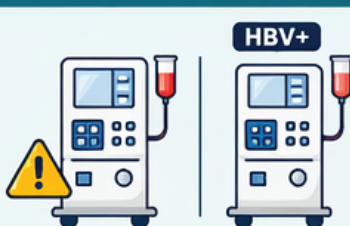
INFECTION CONTROL PROTOCOLS

Universal Infection Control Precautions



RIGOROUS APPLICATION OF HYGIENIC PRECAUTIONS

Hand hygiene, use of PPE, and standard precautions must always be practiced.



MANDATORY MACHINE SEGREGATION

HBV-positive patients require separate, dedicated dialysis machines to prevent cross-contamination.



DECONTAMINATION PROCEDURES

Any machine used for an HBV-infected patient must undergo a full decontamination protocol before reuse for non-infected patients.

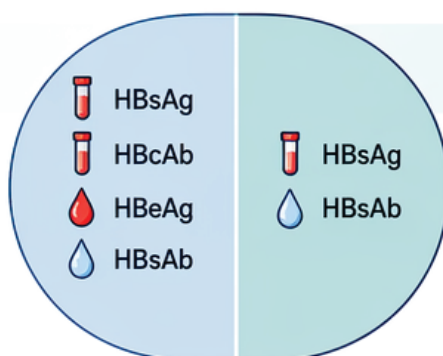
THE BIANNUAL TESTING SCHEDULE



FEBRUARY CYCLE
(OR ENTRY INTO UNIT)



NOTE: specific markers like HBcAb and HBeAg are mandatory if HBsAb levels are ≤ 10 mIU/ml



AUGUST CYCLE



NOTE: If HBsAb > 10 mIU/ml, HBsAb testing is only required once a year

SEROLOGY "CHEAT SHEET"



HBsAg (Surface Antigen):

The primary marker for current infection; infection status cannot be determined if omitted.



HBsAb (Surface Antibody):

A positive result confirms immunity against future HBV exposure.

INTERPRETATION GUIDE

MARKER PROFILE	CLINICAL SIGNIFICANCE
HBsAg Positive	Current Infection
HBsAg+ AND HBcAb+ AND HBeAg+	Current Infection (High Replication Rate)
HBsAg+ AND HBcAb+ AND HBeAg+ AND HBcIgM+	Current Infection (Likely Recent/Acute)
HBsAg Negative AND HBcAb+ AND HBsAb+	Past Infection (Current Immunity)
HBsAg Negative AND HBcAb Negative AND HBsAb+	Immunity due to Vaccination
HBsAg Negative AND HBcAb+ AND HBsAb Negative	Occult/Previous Infection (Requires PCR/Viral Load)



PRO-TIP: ORDER CORRECTLY TO PREVENT DELAYS

Incorrect test ordering leads to delayed results, necessitating re-draws, and potential delays in dialysis treatment for the patient.

