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# GUIDELINES FOR THE PREVENTION, CARE AND TREATMENT OF PERSONS WITH CHRONIC HEPATITIS B INFECTION

POLICY BRIEF



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AND TREATMENT OF PERSONS WITH  
CHRONIC HEPATITIS B INFECTION**

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Policy brief: Guidelines for the prevention, care and treatment of persons with chronic hepatitis B infection  
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## BACKGROUND

Hepatitis B infection is caused by the hepatitis B virus (HBV), an enveloped DNA virus that infects the liver, causing hepatocellular necrosis and inflammation. Chronic hepatitis B (CHB) – defined as persistence of hepatitis B surface antigen (HBsAg) for six months or more – is a major public health problem. Worldwide, there are an estimated 240 million chronically infected persons, particularly in low- and middle-income countries (LMICs). The major complications of CHB are cirrhosis and hepatocellular carcinoma (HCC). Between 20% and 30% of those who become chronically infected will develop these

complications, and an estimated 650 000 people will die annually from HCC and cirrhosis due to CHB. The majority of people are unaware of their HBV infection, and therefore often present with advanced disease. Universal hepatitis B immunization programmes that target infants, with the first dose at birth, have been highly effective in reducing the incidence and prevalence of hepatitis B in many endemic countries. However, these programmes will not have an impact on HBV-related deaths until several decades after their introduction.

## ABOUT THE GUIDELINES

These are the first World Health Organization (WHO) guidelines for the prevention, care and treatment of persons living with CHB infection.

The recommendations are structured along the continuum of care for persons with CHB from initial assessment of stage of disease and eligibility for treatment, to initiation of first-line antiviral therapy and monitoring for disease progression, toxicity and HCC, and switch to second-line drugs in persons with treatment failure. They are intended for use across age groups and adult populations.

The recommendations promote the use of simple, non-invasive diagnostic tests to assess the stage of liver disease and eligibility for treatment; prioritize treatment for those with most advanced liver disease and at greatest risk of mortality; recommend the preferred use of the nucleos(t)ide analogues with a high barrier to drug resistance (tenofovir and entecavir, and entecavir in children aged 2–11 years) for first- and second-line treatment. These guidelines also recommend lifelong treatment in those with cirrhosis; and regular monitoring for disease progression, toxicity of drugs and early detection of HCC. Management considerations for

specific populations are also highlighted, including those coinfecting with HIV, HCV and hepatitis D virus (HDV); children and adolescents; and pregnant women.

Existing WHO recommendations for the prevention of HBV transmission are also highlighted, in particular the prevention of perinatal and early childhood HBV infection through infant hepatitis B vaccination.

These recommendations provide opportunities to save lives, improve clinical outcomes of persons living with CHB, reduce HBV incidence and transmission, and disease stigma, but they also pose practical challenges to policy-makers and implementers in LMICs. An additional guidelines chapter covers implementation considerations across the health system for national programmes in adopting the key recommendations. These address the necessary decision-making and planning for the development of hepatitis treatment programmes in the context of HBV epidemiology, health systems capacity, laboratory services and supply systems for drugs and other commodities, as well as available financial resources, and ethical and human rights considerations.

<sup>1</sup> Defined as persistence of hepatitis B surface antigen (HBsAg) for six months or more. The term chronic hepatitis B (CHB) is used to mean chronic infection with HBV throughout these guidelines.

# SUMMARY OF RECOMMENDATIONS FOR PERSONS WITH CHRONIC HEPATITIS B INFECTION

## NON-INVASIVE ASSESSMENT OF LIVER DISEASE STAGE AT BASELINE AND DURING FOLLOW UP

	<ul style="list-style-type: none"> <li>APRI (aspartate aminotransferase [AST]-to-platelet ratio index) is recommended as the preferred non-invasive test (NIT) to assess for the presence of cirrhosis (APRI score &gt;2 in adults) in resource-limited settings. Transient elastography (e.g. FibroScan) or FibroTest may be the preferred NITs in settings where they are available and cost is not a major constraint. <i>(Conditional recommendation, low quality of evidence)</i></li> </ul>
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## WHO TO TREAT AND WHO NOT TO TREAT IN PERSONS WITH CHRONIC HEPATITIS B

<b>Who to treat</b>	<ul style="list-style-type: none"> <li><b>As a priority</b>, all adults, adolescents and children with CHB and clinical evidence of compensated or decompensated cirrhosis (or cirrhosis based on APRI score &gt;2 in adults) should be treated, regardless of ALT levels, HBeAg status or HBV DNA levels. <i>(Strong recommendation, moderate quality of evidence)</i></li> <li>Treatment is recommended for adults with CHB who do not have clinical evidence of cirrhosis (or based on APRI score <math>\leq</math>2 in adults), but are aged more than 30 years (in particular), <b>and</b> have persistently abnormal ALT levels <b>and</b> evidence of high-level HBV replication (HBV DNA &gt;20 000 IU/mL), regardless of HBeAg status. <i>(Strong recommendation, moderate quality of evidence)</i> <ul style="list-style-type: none"> <li>Where HBV DNA testing is not available: Treatment may be considered based on persistently abnormal ALT levels alone, regardless of HBeAg status. <i>(Conditional recommendation, low quality of evidence)</i></li> </ul> </li> </ul>
<b>Existing recommendation for HBV/HIV-coinfected persons<sup>1</sup></b>	<ul style="list-style-type: none"> <li>In HBV/HIV-coinfected individuals, ART should be initiated in all those with evidence of severe chronic liver disease, regardless of CD4 count; and in all those with a CD4 count <math>\leq</math>500 cells/mm<sup>3</sup>, regardless of stage of liver disease. <i>(Strong recommendation, low quality of evidence)</i></li> </ul> <p><sup>1</sup>Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach. Geneva, Switzerland: World Health Organization; 2013. These guidelines will be updated in 2015.</p>
<b>Who not to treat but continue to monitor</b>	<ul style="list-style-type: none"> <li>Antiviral therapy is <b>not</b> recommended and can be deferred in persons without clinical evidence of cirrhosis (or based on APRI score <math>\leq</math>2 in adults), <b>and</b> with persistently normal ALT levels <b>and</b> low levels of HBV DNA replication (HBV DNA &lt;2000 IU/mL), regardless of HBeAg status or age. <i>(Strong recommendation, low quality of evidence)</i> <ul style="list-style-type: none"> <li>Where HBV DNA testing is not available: Treatment can be deferred in HBeAg-positive persons aged 30 years or less <b>and</b> persistently normal ALT levels. <i>(Conditional recommendation, low quality of evidence)</i></li> </ul> </li> <li>Continued monitoring is necessary in all persons with CHB, but in particular those who do not currently meet the above-recommended criteria for who to treat or not treat, to determine if antiviral therapy may be indicated in the future to prevent progressive liver disease. These include:           <ul style="list-style-type: none"> <li>persons without cirrhosis aged 30 years or less, with HBV DNA levels &gt;20 000 IU/mL <b>but</b> persistently normal ALT levels;</li> <li>HBeAg-negative persons without cirrhosis aged 30 years or less, with HBV DNA levels that fluctuate between 2000 and 20 000 IU/mL, <b>or</b> who have intermittently abnormal ALT levels;</li> <li>Where HBV DNA testing is not available: Persons without cirrhosis aged 30 years or less, with persistently normal ALT levels, regardless of HBeAg status.</li> </ul> </li> </ul>

## FIRST-LINE ANTIVIRAL THERAPIES FOR CHRONIC HEPATITIS B

	<ul style="list-style-type: none"> <li>In all adults, adolescents and children aged 12 years or older in whom antiviral therapy is indicated, the nucleos(t)ide analogues (NAs) which have a high barrier to drug resistance (tenofovir or entecavir) are recommended. Entecavir is recommended in children aged 2–11 years. <i>(Strong recommendation, moderate quality of evidence)</i></li> <li>NAs with a low barrier to resistance (lamivudine, adefovir or telbivudine) can lead to drug resistance and are not recommended. <i>(Strong recommendation, moderate quality of evidence)</i></li> </ul>
<b>Existing recommendation for HBV/HIV-coinfected persons<sup>1</sup></b>	<ul style="list-style-type: none"> <li>In HBV/HIV-coinfected adults, adolescents and children aged 3 years or older, tenofovir + lamivudine (or emtricitabine) + efavirenz as a fixed-dose combination is recommended as the preferred option to initiate ART. <i>(Strong recommendation, moderate quality of evidence)</i></li> </ul> <p><sup>1</sup> Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach. Geneva: World Health Organization; 2013. These guidelines will be updated in 2015.</p>

## SECOND-LINE ANTIVIRAL THERAPIES FOR THE MANAGEMENT OF TREATMENT FAILURE

	<ul style="list-style-type: none"> <li>In persons with confirmed or suspected antiviral resistance (i.e. history of prior exposure or primary non-response) to lamivudine, entecavir, adefovir or telbivudine, a switch to tenofovir is recommended. <i>(Strong recommendation, low quality of evidence)</i></li> </ul>
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## WHEN TO STOP TREATMENT

<b>Lifelong NA therapy</b>	<ul style="list-style-type: none"> <li>All persons <b>with cirrhosis</b> based on clinical evidence (or APRI score &gt;2 in adults) require lifelong treatment with nucleos(t)ide analogues (NAs), and should not discontinue antiviral therapy because of the risk of reactivation, which can cause severe acute-on-chronic liver injury. <i>(Strong recommendation, low quality of evidence)</i></li> </ul>
<b>Discontinuation</b>	<ul style="list-style-type: none"> <li>Discontinuation of NA therapy may be considered exceptionally in:           <ul style="list-style-type: none"> <li>persons without clinical evidence of cirrhosis (or based on APRI score ≤2 in adults);</li> <li><b>and</b> who can be followed carefully long term for reactivation;</li> <li><b>and</b> if there is evidence of HBeAg loss and seroconversion to anti-HBe (in persons initially HBeAg positive) and after completion of at least one additional year of treatment;</li> <li><b>and</b> in association with persistently normal ALT levels <b>and</b> persistently undetectable HBV DNA levels <i>(where HBV DNA testing is available)</i>.</li> </ul> </li> <li>Where HBV DNA testing is not available: Discontinuation of NA therapy may be considered in persons who have evidence of persistent HBsAg loss and after completion of at least one additional year of treatment, regardless of prior HBeAg status. <i>(Conditional recommendation, low quality of evidence)</i></li> </ul>
<b>Retreatment</b>	<ul style="list-style-type: none"> <li>Relapse may occur after stopping therapy with NAs. Retreatment is recommended if there are consistent signs of reactivation (HBsAg or HBeAg becomes positive, ALT levels increase, or HBV DNA becomes detectable again) <i>(where HBV DNA testing is available)</i>. <i>(Strong recommendation, low quality of evidence)</i></li> </ul>

## MONITORING

### Monitoring for disease progression and treatment response in persons with CHB prior to, during and post-treatment

	<ul style="list-style-type: none"> <li>It is recommended that the following be monitored at least annually:           <ul style="list-style-type: none"> <li>ALT level (and AST for APRI), HBsAg, HBeAg, and HBV DNA levels <i>(where HBV DNA testing is available)</i></li> <li>Non-invasive tests (APRI score or FibroScan) to assess for the presence of cirrhosis, in those without cirrhosis at baseline;</li> <li>If on treatment, adherence should be monitored regularly and at each visit. <i>(Strong recommendation, moderate quality of evidence)</i></li> </ul> </li> </ul>
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<b>More frequent monitoring</b>	<ul style="list-style-type: none"> <li>• <b>In persons who do not yet meet the criteria for antiviral therapy:</b> More frequent monitoring for disease progression may be indicated in: persons who have intermittently abnormal ALT levels or HBV DNA levels that fluctuate between 2000 IU/mL and 20 000 IU/mL (<i>where HBV DNA testing is available</i>), and in HIV-coinfected persons. (<i>Conditional recommendation, low quality of evidence</i>)</li> <li>• <b>In persons on treatment or following treatment discontinuation:</b> More frequent on-treatment monitoring (at least every 3 months for the first year) is indicated in: persons with more advanced disease (compensated or decompensated cirrhosis); during the first year of treatment to assess treatment response and adherence; where treatment adherence is a concern; in HIV-coinfected persons; and in persons after discontinuation of treatment. (<i>Conditional recommendation, very low quality of evidence</i>)</li> </ul>
<b>Monitoring for tenofovir and entecavir toxicity</b>	
	<ul style="list-style-type: none"> <li>• Measurement of baseline renal function and assessment of baseline risk for renal dysfunction should be considered in all persons prior to initiation of antiviral therapy.</li> <li>• Renal function should be monitored annually in persons on long-term tenofovir or entecavir therapy, and growth monitored carefully in children. (<i>Conditional recommendation, very low quality of evidence</i>)</li> </ul>
<b>Monitoring for hepatocellular carcinoma</b>	
	<ul style="list-style-type: none"> <li>• Routine surveillance for HCC with abdominal ultrasound and alpha-fetoprotein testing every six months is recommended for: <ul style="list-style-type: none"> <li>- persons with cirrhosis, regardless of age or other risk factors (<i>Strong recommendation, low quality of evidence</i>)</li> <li>- persons with a family history of HCC (<i>Strong recommendation, low quality of evidence</i>)</li> <li>- persons aged over 40 years (lower age may apply according to regional incidence of HCC), without clinical evidence of cirrhosis (or based on APRI score <math>\leq 2</math>), and with HBV DNA level &gt;2000 IU/mL (<i>where HBV DNA testing is available</i>). (<i>Conditional recommendation, low quality of evidence</i>)</li> </ul> </li> </ul>

## PREVENTION

### Infant and neonatal hepatitis B vaccination

#### **Existing recommendations in infants and neonates<sup>1</sup>**

- All infants should receive their first dose of hepatitis B vaccine as soon as possible after birth, preferably within 24 hours, followed by two or three doses.
- <sup>1</sup>WHO. Hepatitis B vaccines. Wkly Epidemiol Rec. 2009;84:405–20.

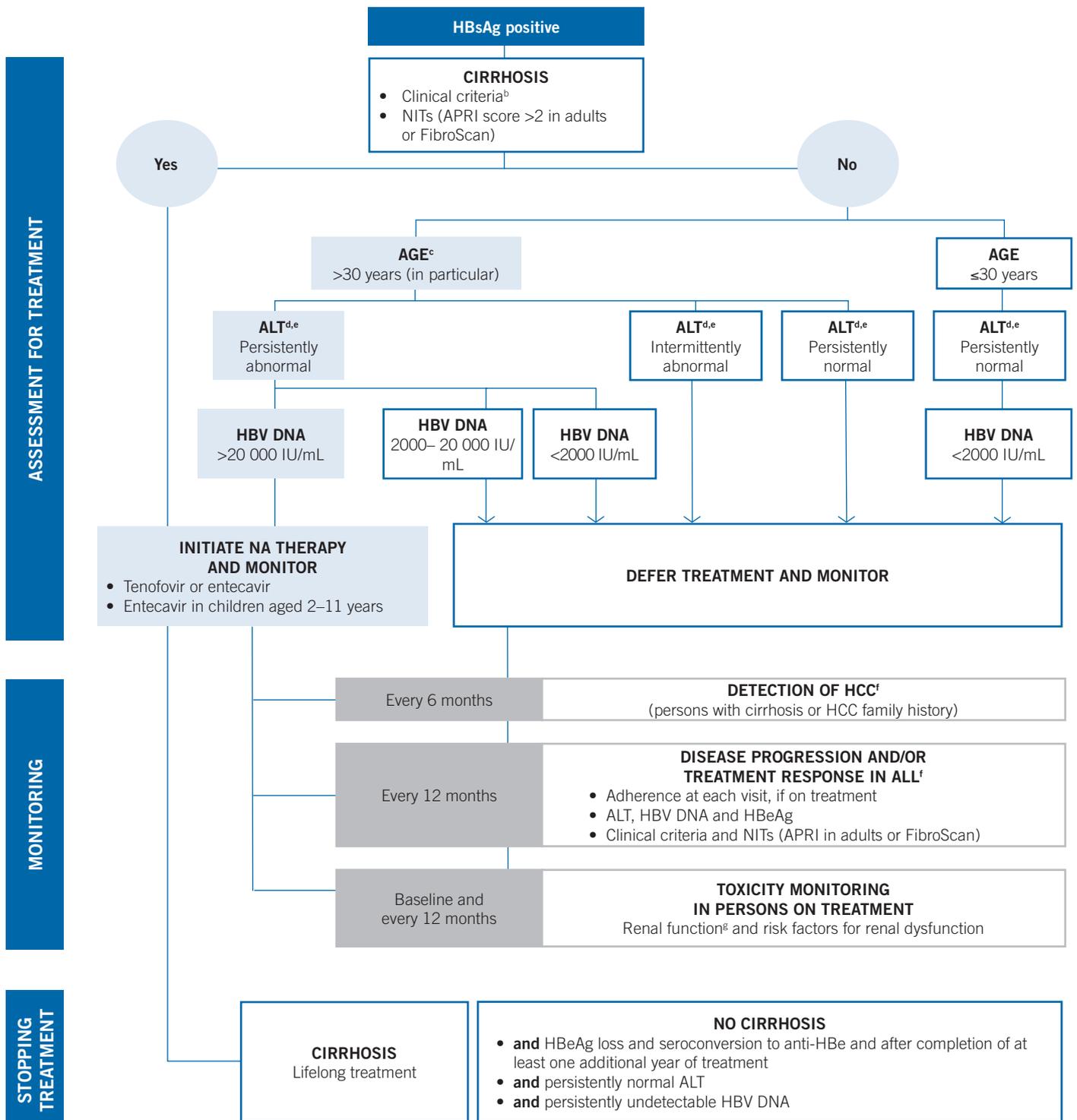
### Prevention of mother-to-child HBV transmission using antiviral therapy

#### **Existing recommendations in HIV-infected pregnant and breastfeeding women<sup>2</sup>**

- In HBV-monoinfected pregnant women, the indications for treatment are the same as for other adults, and tenofovir is recommended. No recommendation was made on the routine use of antiviral therapy to prevent mother-to-child HBV transmission.
- In HIV-infected pregnant and breastfeeding women (including pregnant women in the first trimester of pregnancy and women of childbearing age), a once-daily fixed-dose combination of tenofovir + lamivudine (or emtricitabine) + efavirenz is recommended as first-line ART. This recommendation applies both to lifelong treatment and to ART initiated for PMTCT and then stopped. (*Strong recommendation, low to moderate quality of evidence*)

<sup>2</sup>Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach. Geneva: World Health Organization; 2013. These guidelines will be updated in 2015.

# ALGORITHM OF WHO RECOMMENDATIONS ON THE MANAGEMENT OF PERSONS WITH CHRONIC HEPATITIS B INFECTION<sup>a</sup>



NITs non-invasive tests, ALT alanine aminotransferase, APRI aspartate aminotransferase-to-platelet ratio index

<sup>a</sup> Defined as persistence of hepatitis B surface antigen (HBsAg) for six months or more. The algorithm does not capture all potential scenarios, but the main categories for treatment or monitoring. Recommendations for settings without access to HBV DNA testing are provided in the relevant chapters.

<sup>b</sup> Clinical features of decompensated cirrhosis: Portal hypertension (ascites, variceal haemorrhage and hepatic encephalopathy), coagulopathy, or liver insufficiency (jaundice). Other clinical features of advanced liver disease/cirrhosis may include: hepatomegaly, splenomegaly, pruritus, fatigue, arthralgia, palmar erythema, and oedema.

<sup>c</sup> The age cut-off of >30 years is not absolute, and some persons with CHB less than 30 years may also meet criteria for antiviral treatment.

<sup>d</sup> ALT levels fluctuate in persons with chronic hepatitis B and require longitudinal monitoring to determine the trend. Upper limits for normal ALT have been defined as below 30 U/L for men and 19 U/L for women, though local laboratory normal ranges should be applied. Persistently normal/abnormal may be defined as three ALT determinations below or above the upper limit of normal, made at unspecified intervals during a 6–12-month period or predefined intervals during 12-month period.

<sup>e</sup> Where HBV DNA testing is not available, treatment may be considered based on persistently abnormal ALT levels, but other common causes of persistently raised ALT levels such as impaired glucose tolerance, dyslipidaemia and fatty liver should be excluded.

<sup>f</sup> All persons with CHB should be monitored regularly for disease activity/progression and detection of HCC, and after stopping treatment for evidence of reactivation. More frequent monitoring may be required in those with more advanced liver disease, during the first year of treatment or where adherence is a concern, and in those with abnormal ALT and HBV DNA levels >2000 IU/mL, not yet on treatment.

<sup>g</sup> Before initiation, assessment should be done of renal function (serum creatinine level, estimated glomerular filtration rate, urine dipsticks for proteinuria and glycosuria, and risk factors for renal dysfunction (decompensated cirrhosis, CrCl <50 mL/min, poorly controlled hypertension, proteinuria, uncontrolled diabetes, active glomerulonephritis, concomitant nephrotoxic drugs, solid organ transplantation, older age, BMI <18.5 kg/m<sup>2</sup> (or body weight <50 kg), concomitant use of nephrotoxic drugs or a boosted protease inhibitor (PI) for HIV). Monitoring should be more frequent in those at higher risk of renal dysfunction.

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