

ANTIRETROVIRAL LAB MONITORING (Part 1 of 2)

Laboratory Monitoring Schedule for Patients Before and After Initiation of Antiretroviral Therapy

	Baseline	Initiation or modification ^a	Follow-up 2–8 weeks after initiation or modification	Every 3–6 months	Every 6 months	Every 12 months	Treatment failure	Clinically indicated	Delayed initiation ^a
HIV serology	If diagnosis has not been confirmed								
CD4 count	✓	✓		During first 2yrs of ART or if viremia develops while patient on ART or CD4 count <300 cells/mm ³		After 2yrs on ART with consistently suppressed viral load: if CD4 count 300–500 cells/mm ³ , monitor every 12 months. CD4 count >500 cells/mm ³ , monitoring is optional	✓	✓	Every 3–6mos
HIV viral load	✓	✓	✓ ^b	✓ ^c	✓ ^c		✓	✓	Repeat testing is optional
Resistance testing	✓	✓ ^d					✓	✓	✓ ^d
HLA-B*5701 testing		If considering ABC							
Tropism testing		If considering CCR5 antagonist					If considering CCR5 antagonist or CCR5 antagonist-based regimen failed	✓	
Hepatitis B serology (HBsAb, HBsAg, HbCAb, total) ^{i,k}	✓	May repeat if nonimmune and no chronic HBV infection ^l				May repeat if nonimmune and no chronic HBV infection ^l		Including prior to starting HCV DAA	
Hepatitis C screening (HCV antibody or, if indicated, HCV RNA) ^m	✓					Repeat HCV screening for at-risk patients ^m		✓	
Basic chemistry ^{f,g}	✓	✓	✓	✓				✓	Every 6–12mos
ALT, AST, T. bilirubin	✓	✓	✓	✓				✓	Every 6–12mos
CBC with differential	✓	✓	If on ZDV	If on ZDV or CD4 testing done	✓			✓	Every 3–6mos
Fasting lipid profile ^h	✓	✓			If abnormal at last measurement	If normal at last measurement		✓	If normal at baseline, annually
Fasting glucose or hemoglobin A1C	✓	✓		If abnormal at last measurement		If normal at last measurement		✓	If normal at baseline, annually
Urinalysis ^{g,h}	✓	✓			If on TAF or TDF ^l	✓		✓	
Pregnancy test ^o	✓	✓						✓	

(continued)

NOTES

This table pertains to laboratory tests done to select an ARV regimen and monitor for treatment responses or ART toxicities. Please refer to the HIV Primary Care guidelines for guidance on other laboratory tests generally recommended for primary health care maintenance of HIV patients.

- a If ART initiation occurs soon after HIV diagnosis, repeat baseline testing is not necessary.
- b If HIV RNA is detectable at 2–8 weeks, repeat every 4–8 weeks until suppression to <200 copies/mL, then every 3–6 months.
- c Viral load typically is measured every 3–4 months in patients on ART. However, for adherent patients with consistently suppressed viral load and stable immunologic status for ≥2yrs, may extend monitoring to 6-month intervals.
- d Standard genotypic drug-resistance testing in ART-naive patients should focus on mutations in the reverse transcriptase and protease genes. Also test for mutations to integrase strand transfer inhibitors if resistance is a concern. In ART-naive patients, if resistance testing was performed at entry into care, repeat testing before initiation of ART is optional. For virologically suppressed patients who are switching therapy for toxicity or convenience, viral amplification will not be possible and therefore resistance testing should not be performed. Results from prior resistance testing can be used to help in the construction of a new regimen.
- e ART is indicated for all patients with HIV and should be started as soon as possible. If ART initiation is delayed, patients should be retained in care, with periodic monitoring as noted above.
- f Serum Na, K, HCO₃, Cl, BUN, creatinine, glucose (preferably fasting), and creatinine-based estimated GFR. Monitor serum phosphorus in patients with CKD who are on TAF- or TDF-based regimens.
- g For patients with renal disease, consult the Guidelines for the Management of Chronic Kidney Disease in HIV-Infected Patients: Recommendations of the HIV Medicine Association of the Infectious Diseases Society of America. More frequent monitoring may be indicated for patients with evidence of kidney disease (eg, proteinuria, decreased glomerular dysfunction) or increased risk of renal insufficiency (eg, patients with diabetes, hypertension).
- h Assess urine glucose and protein before initiating TAF- or TDF-based regimens, and monitor during treatment.
- i If patient has HBV infection (as determined by a positive HBsAg or HBV DNA test), TDF or TAF plus either FTC or 3TC should be used as part of the ARV regimen to treat both HBV and HIV infections.
- j If HBsAg, HBsAb, and HbCAb are negative, HBV vaccine series should be given.
- k Most patients with isolated HbCAb have resolved HBV infection with loss of HBsAb. Consider performing an HBV viral load for confirmation. If HBV viral load is positive, patient may be acutely infected (and will usually display other signs of acute hepatitis) or chronically infected. If negative, patient should be vaccinated.
- l The HCV antibody test may not be adequate for screening in recent HCV infection (within the past 6mos), or advanced immunodeficiency (CD4 <100cells/mm³). HCV RNA screening is indicated in patients who have been successfully treated for HCV or who spontaneously cleared prior infection. HCV antibody-negative patients with elevated ALT may need HCV RNA testing.
- m At-risk patients for HCV infection include injection drug users, persons with a history of incarceration, men with HIV who have unprotected sex with men, and persons with percutaneous/parenteral exposure to blood in unregulated settings.
- n Consult the National Lipid Association's recommendations for management of patients with dyslipidemia.
- o This applies to patients of childbearing potential.

Acronyms:

3TC = lamivudine	CrCl = creatinine clearance	HBV = hepatitis B virus
ABC = abacavir	DAA = direct-acting antiviral	HCV = hepatitis C virus
ALT = alanine aminotransferase	EFV = efavirenz	TAF = tenofovir alafenamide
ART = antiretroviral therapy	FTC = emtricitabine	TDF = tenofovir disoproxil fumarate
AST = aspartate aminotransferase	GFR = glomerular filtration rate	ZDV = zidovudine
CBC = complete blood count	HBsAb = hepatitis B surface antibody	
CKD = chronic kidney disease	HBsAg = hepatitis B surface antigen	

REFERENCES

Panel on Antiretroviral Guidelines for Adults and Adolescents. *Guidelines for the Use of Antiretroviral Agents in Adults and Adolescents Living with HIV*. Department of Health and Human Services. Available at <http://www.aidsinfo.nih.gov/ContentFiles/AdultandAdolescentGL.pdf>. Accessed January 22, 2019 [Table 3]. (Rev. 2/2019)