

# HLA-B\*5701 Screening

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Panel's Recommendations
<ul style="list-style-type: none"><li>• The Panel recommends screening for HLA-B*5701 before starting patients on an abacavir (ABC)-containing regimen to reduce the risk of hypersensitivity reaction (HSR) <b>(AI)</b>.</li><li>• HLA-B*5701-positive patients should not be prescribed ABC <b>(AI)</b>.</li><li>• The positive status should be recorded as an ABC allergy in the patient's medical record <b>(AII)</b>.</li><li>• When HLA-B*5701 screening is not readily available, it remains reasonable to initiate ABC with appropriate clinical counseling and monitoring for any signs of HSR <b>(CIII)</b>.</li></ul>
<b>Rating of Recommendations:</b> A = Strong; B = Moderate; C = <b>Weak</b>
<b>Rating of Evidence:</b> I = data from randomized controlled trials; II = data from well-designed nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = expert opinion

The abacavir (ABC) hypersensitivity reaction (HSR) is a multiorgan clinical syndrome typically seen within the initial 6 weeks of ABC treatment. This reaction has been reported in 5% to 8% of patients participating in clinical trials when using clinical criteria for the diagnosis, and it is the major reason for early discontinuation of ABC. Discontinuing ABC usually promptly reverses HSR, whereas subsequent rechallenge can cause a rapid, severe, and even life-threatening recurrence.<sup>1</sup>

Studies that evaluated demographic risk factors for ABC HSR have shown racial background as a risk factor, with white patients generally having a higher risk (5%–8%) than black patients (2%–3%). Several groups reported a highly significant association between ABC HSR and the presence of the major histocompatibility complex (MHC) class I allele HLA-B\*5701.<sup>2, 3</sup> Because the clinical criteria used for ABC HSR are overly sensitive and may lead to false-positive ABC HSR diagnoses, an ABC skin patch test (SPT) was developed as a research tool to immunologically confirm ABC HSR.<sup>4</sup> A positive ABC SPT is an ABC-specific delayed HSR that results in redness and swelling at the skin site of application. All ABC SPT-positive patients studied were also positive for the HLA-B\*5701 allele.<sup>5</sup> The ABC SPT could be falsely negative for some patients with ABC HSR and, at this point, is not recommended for use as a clinical tool. The PREDICT-1 study randomized participants with HIV before starting ABC either to be prospectively screened for HLA-B\*5701 (with HLA-B\*5701-positive patients not offered ABC) or to standard of care at the time of the study (i.e., no HLA screening, with all patients receiving ABC).<sup>6</sup> The overall HLA-B\*5701 prevalence in this predominately white population was 5.6%. In this cohort, screening for HLA-B\*5701 eliminated immunologic ABC HSR (defined as ABC SPT positive) compared with standard of care (0% vs. 2.7%), yielding a 100% negative predictive value with respect to SPT and significantly decreasing the rate of clinically suspected ABC HSR (3.4% vs. 7.8%). The SHAPE study corroborated the low rate of immunologically validated ABC HSR in black patients and confirmed the utility of HLA-B\*5701 screening for the risk of ABC HSR (100% sensitivity in black and white populations).<sup>7</sup>

On the basis of the results of these studies, the Panel recommends screening for HLA-B\*5701 before starting an ABC-containing regimen in a person with HIV **(AI)**. HLA-B\*5701-positive patients should not be prescribed ABC **(AI)**, and the positive status should be recorded as an ABC allergy in the patient's medical record **(AII)**. HLA-B\*5701 testing is needed only once in a patient's lifetime; thus, efforts to carefully record and maintain the test result and to educate the patient about its implications are important. The specificity of the HLA-B\*5701 test in predicting ABC HSR is lower than the sensitivity (i.e., 33%–50% of HLA-B\*5701-positive patients would likely not develop

confirmed ABC HSR if exposed to ABC). HLA-B\*5701 should not be used as a substitute for clinical judgment or pharmacovigilance, because a negative HLA-B\*5701 result does not absolutely rule out the possibility of some form of ABC HSR. When HLA-B\*5701 screening is not readily available, it remains reasonable to initiate ABC with appropriate clinical counseling and monitoring for any signs of ABC HSR **(CIII)**.

## References

1. Hetherington S, McGuirk S, Powell G, et al. Hypersensitivity reactions during therapy with the nucleoside reverse transcriptase inhibitor abacavir. *Clin Ther*. 2001;23(10):1603-1614. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/11726000>.
2. Mallal S, Nolan D, Witt C, et al. Association between presence of HLA-B\*5701, HLA-DR7, and HLA-DQ3 and hypersensitivity to HIV-1 reverse-transcriptase inhibitor abacavir. *Lancet*. 2002;359(9308):727-732. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/11888582>.
3. Hetherington S, Hughes AR, Mosteller M, et al. Genetic variations in HLA-B region and hypersensitivity reactions to abacavir. *Lancet*. 2002;359(9312):1121-1122. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/11943262>.
4. Phillips EJ, Sullivan JR, Knowles SR, Shear NH. Utility of patch testing in patients with hypersensitivity syndromes associated with abacavir. *AIDS*. 2002;16(16):2223-2225. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/12409746>.
5. Phillips E, Rauch A, Nolan D, et al. Pharmacogenetics and clinical characteristics of patch test confirmed patients with Abacavir hypersensitivity. 7th International Workshop on Clinical Pharmacology of HIV Therapy; 2006; Lisbon, Portugal.
6. Mallal S, Phillips E, Carosi G, et al. HLA-B\*5701 screening for hypersensitivity to abacavir. *N Engl J Med*. 2008;358(6):568-579. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/18256392>.
7. Saag M, Balu R, Phillips E, et al. High sensitivity of human leukocyte antigen-b\*5701 as a marker for immunologically confirmed abacavir hypersensitivity in white and black patients. *Clin Infect Dis*. 2008;46(7):1111-1118. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/18444831>.