

Draft Guidance on Verapamil Hydrochloride

This draft guidance, once finalized, will represent the Food and Drug Administration's (FDA's) current thinking on this topic. It does not create or confer any rights for or on any person and does not operate to bind FDA or the public. You can use an alternative approach if the approach satisfies the requirements of the applicable statutes and regulations. If you want to discuss an alternative approach, contact the Office of Generic Drugs.

Active ingredient: Verapamil Hydrochloride

Form/Route: Extended Release Tablet/Oral

Recommended studies: 4 studies

1. Type of study: Fasting
Design: Single-dose, two-way crossover in-vivo
Strength: 240 mg
Subjects: Healthy males and nonpregnant females, general population.
Additional comments:

2. Type of study: Fed
Design: Single-dose, two-way crossover in-vivo
Strength: 240 mg
Subjects: Healthy males and nonpregnant females, general population.
Additional Comments: If you decide not to pursue the 240 mg strength, a fed bioequivalence study is necessary for the highest to-be-marketed strength. If you choose to pursue the 240 mg strength at a later time, an additional fasting bioequivalence study is needed.

3. Type of study: Fasting
Design: Single-dose, two-way crossover in-vivo
Strength: 180 mg
Subjects: Healthy males and nonpregnant females, general population
Additional comments:

4. Type of study: Fasting
Design: Single-dose, two-way crossover in-vivo
Strength: 120 mg
Subjects: Healthy males and nonpregnant females, general population
Additional comments:

Analytes to measure (in appropriate biological fluid): Verapamil and its active metabolite, norverapamil, in plasma

Please submit the metabolite data as supportive evidence of comparable therapeutic outcome. For the metabolite, the following data should be submitted: individual and mean concentrations, individual and mean pharmacokinetic parameters, and geometric means and ratios of means for AUC and Cmax.

Bioequivalence based on (90% CI): Verapamil

Waiver request of in-vivo testing: Not Applicable

Dissolution test method and sampling times:

Please note that a **Dissolution Methods Database** is available to the public at the OGD website at <http://www.accessdata.fda.gov/scripts/cder/dissolution/>. Please find the dissolution information for this product at this website. Please conduct comparative dissolution testing on 12 dosage units each of all strengths of the test and reference products. Specifications will be determined upon review of the application.

In addition to the method above, for modified release products, dissolution profiles on 12 dosage units each of test and reference products generated using USP Apparatus I at 100 rpm and/or Apparatus II at 50 rpm in at least three dissolution media (pH 1.2, 4.5 and 6.8 buffer) should be submitted in the application. Agitation speeds may have to be increased if appropriate. It is acceptable to add a small amount of surfactant, if necessary. Please include early sampling times of 1, 2, and 4 hours and continue every 2 hours until at least 80% of the drug is released, to provide assurance against premature release of drug (dose dumping) from the formulation. Specifications will be determined upon review of the data submitted in the application.