

## Draft Guidance on Oxycodone HCl

This draft guidance, when finalized, will represent the current thinking of the Food and Drug Administration (FDA, or the Agency) on this topic. It does not establish any rights for any person and is not binding on FDA or the public. You can use an alternative approach if it satisfies the requirements of the applicable statutes and regulations. To discuss an alternative approach, contact the Office of Generic Drugs.

**Active Ingredient:** Oxycodone Hydrochloride

**Dosage Form; Route:** Tablet, Extended Release; Oral

**Recommended Studies:** Two bioequivalence studies (1–2) and one in vivo abuse deterrence study (3)

1. Type of study: Fasting  
Design: Single-dose, two-treatment, two-period crossover in vivo  
Strength: 40 mg  
Subjects: Males and non-pregnant, non-lactating females, general population  
Additional Comments: Naltrexone or other opioid antagonist should be incorporated to block the pharmacodynamic (PD) effects of the opioid. The opioid antagonist should be administered well in advance of opioid dosing to achieve adequate blockade of opioid receptors. The most common approach is to administer 50 mg of naltrexone at the following times: (1) 12 hours prior to dosing; (2) at the time of study drug dosing; and (3) 12 hours after the last dose of study drug. Consult with a physician who is an expert in the administration of opioids for an appropriate dose of narcotic antagonist.

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2. Type of study: Fed  
Design: Single-dose, two-treatment, two-period crossover in vivo  
Strength: 40 mg  
Subjects: Males and non-pregnant, non-lactating females, general population  
Additional comments: See comments in Study 1.

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3. Type of study: Fasting, comparative nasal pharmacokinetic (PK) study with physically manipulated drug products, consistent with the recommendations in FDA’s guidance, “*General Principles for Evaluating the Abuse Deterrence of Generic Solid Oral Opioid Drug Products*,” for tier 2 evaluation of abuse by insufflation as applicable  
Design: Single-dose, two-treatment, two-period crossover in vivo  
Strength: 30 mg  
Subjects: Non-dependent recreational opioid users, general population<sup>1</sup>  
Additional comments: See comments in Study 1. Take scientifically appropriate and ethical steps to protect human subjects. This should include ensuring that each subject is

<sup>1</sup> This means non-dependent recreational opioid users from the general population who have experience in the use of opioids for non-therapeutic purposes.

not physically dependent on opioids (e.g., through a naloxone challenge test) and has not been seeking or undergoing treatment for abuse of controlled substances such that participating in the study could make them vulnerable to relapse.<sup>2</sup> Pulverize test and reference products to a particle size range that is considered safe and tolerable for human insufflation studies. Characterize the formulation recovery, drug content, and particle size distribution of physically manipulated test and reference drug products used in the nasal PK study using validated analytical procedures. Determine relevant PK parameters including maximum concentration ( $C_{max}$ ), area-under-the-curve ( $AUC_{0-t}$ , and  $AUC_{0-\infty}$ ), and time to maximum concentration ( $T_{max}$ ). Applicants should submit partial AUCs (e.g.,  $AUC_{0-3 \text{ hours}}$  and  $AUC_{0-4 \text{ hours}}$ ) as supporting data.

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**Analytes to measure (in appropriate biological fluid):** Oxycodone in plasma

**Bioequivalence based on (90% CI):** Oxycodone

**Abuse deterrence based on (upper 95% confidence bound):** Oxycodone

**Waiver request of in vivo testing:** 10 mg, 15 mg, 20 mg, 30 mg, 60 mg and 80 mg based on (i) acceptable bioequivalence studies on the 40 mg strength, (ii) acceptable in vitro dissolution testing of all strengths, and (iii) proportional similarity of the formulations across all strengths.

**Abuse Deterrence Evaluation:** Since the FDA has determined that the RLD for oxycodone hydrochloride extended-release tablet (NDA 022272) has properties that are expected to deter abuse (as described in Section 9.2 of the approved Full Prescribing Information), you should refer to the guidance, “*General Principles for Evaluating the Abuse Deterrence of Generic Solid Oral Opioid Drug Products*,” regarding the studies that should be conducted to demonstrate that the proposed generic product is no less abuse-deterrent than the RLD with respect to all potential routes of abuse. Consistent with the guidance, the potential ANDA applicants should consider, among other things, the following:

- (a) Conducting all in vitro abuse deterrence studies using a bracketing design based on appropriate justification (e.g., extremes of the ratios of opioid to excipients contributing to abuse deterrence) or the highest strength based on compositional proportionality of the proposed generic formulations across all strengths.
- (b) Specifying and justifying the total number of tablet units used in a manipulation run (e.g., milling).
- (c) Determining the drug content in manipulated drug products (e.g. cut, grated or milled) and quantifying the drug loss in samples prior to evaluating extractability

**Dissolution test method and sampling times:**

The dissolution information for this drug product can be found on the FDA-Recommended Dissolution Methods website available to the public at the following location: <http://www.accessdata.fda.gov/scripts/cder/dissolution/>. Conduct comparative dissolution testing on 12 dosage units of all strengths of the test and reference products. Specifications will be determined upon review of the abbreviated new drug application (ANDA).

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<sup>2</sup> For criteria on evaluating substance dependence, refer to, for example, the latest version of *Diagnostic and Statistical Manual of Mental Disorders*, Arlington, VA, American Psychiatric Association.

In addition to the method above, for modified release products, dissolution profiles on 12 dosage units 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, 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. 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.

**Alcohol dose dumping studies:**

Due to a concern of dose dumping of drug from this drug product when taken with alcohol, the Agency currently requests that additional dissolution testing be conducted using various concentrations of ethanol in the dissolution medium, as follows:

Testing Conditions: 900 mL, 0.1 N HCl, USP apparatus 1 (basket) @100 rpm, with or without alcohol;

Test 1: 12 units tested according to the proposed method (with 0.1N HCl), with data collected every 15 minutes for a total of 2 hours.

Test 2: 12 units analyzed by substituting 5% (v/v) of test medium with Alcohol USP and data collection every 15 minutes for a total of 2 hours.

Test 3: 12 units analyzed by substituting 20% (v/v) of test medium with Alcohol USP and data collection every 15 minutes for a total of 2 hours.

Test 4: 12 units analyzed by substituting 40% (v/v) of test medium with Alcohol USP and data collection every 15 minutes for a total of 2 hours.

Both test and RLD products must be tested accordingly and data must be provided on individual unit, means, range and %CV.