

Draft Guidance on Clindamycin Phosphate; Tretinoin

This draft guidance, when finalized, will represent the current thinking of the Food and Drug Administration (FDA, or the Agency) on this topic.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:	Clindamycin phosphate; Tretinoin
Dosage Form; Route:	Gel; topical
Recommended Studies:	Two options: (1) in vitro studies or (2) an in vivo study with clinical endpoint

1. Option 1: In vitro studies

To qualify for the in vitro option to demonstrate bioequivalence for clindamycin phosphate; tretinoin topical gel, 1.2%; 0.025%, the following criteria should be met:

- A. The test product should contain no difference in inactive ingredients or in other aspects of the formulation relative to the reference product that may significantly affect the local or systemic availability of the active ingredient. For example, if the test and reference products are qualitatively (Q1) and quantitatively (Q2) the same, as defined in the guidance for industry *ANDA Submissions – Refuse-to-Receive Standards*¹ and the criteria below are also satisfied, the bioequivalence of the test product with respect to the reference product may be established using a characterization-based bioequivalence approach.
- B. The test and reference products should be physically and structurally similar based upon an acceptable comparative physicochemical characterization of a minimum of three batches of the test product and three batches (as available) of the reference product. The characterization of the test and reference products should include the following comparisons of physical and structural attributes between the test and reference products:
 - i. Assessment of visual appearance.
 - ii. Microscopic examination with representative high-resolution microscopic images at multiple magnifications.
 - iii. Analysis of particle size distribution, crystal habit and polymorphic form of tretinoin in the drug product, as applicable.

¹ Guidance for industry *ANDA Submissions – Refuse-to-Receive Standards*

- iv. Analysis of the rheological behavior which may be characterized using a rheometer that is appropriate for monitoring the non-Newtonian flow behavior of semi-solid dosage forms. The following evaluations are recommended:
- A characterization of shear stress vs. shear rate and viscosity vs. shear rate. At minimum, this should consist of numerical viscosity data at three shear rates (low, medium, and high), and may include a complete flow curve across the range of attainable shear rates, until low or high shear plateaus are identified (when possible).
 - Yield stress values should be reported if the material tested exhibits plastic flow behavior.
- v. Analysis of pH, specific gravity, and any other potentially relevant physical and structural similarity characterizations.

C. The test and reference products should have an equivalent rate of clindamycin phosphate and tretinoin release based upon an acceptable in vitro release test (IVRT) comparing a minimum of one batch each of the test and reference products using an appropriately validated IVRT method. Refer to the *Guidance on Acyclovir* (for acyclovir topical cream, 5%)² for additional information regarding the development, validation, conduct and analysis of acceptable IVRT methods/studies. The batches of test and reference products evaluated in the IVRT study should be included among those for which the physical and structural similarity is characterized and compared.

Analytes to measure (in appropriate biological fluid): Not applicable

Bioequivalence based on (90% CI): Refer to the *Guidance on Acyclovir* (for acyclovir topical cream, 5%) for additional information regarding the analysis of in vitro studies.

Waiver request of in vivo testing: Not applicable

Dissolution test method and sampling times: Not applicable

2. Option 2: In vivo study with clinical endpoint

Type of study: Bioequivalence study with clinical endpoint

Design: Randomized, double blind, parallel, placebo controlled, in vivo

Strength: 1.2%; 0.025%

Subjects: Males and nonpregnant, nonlactating females with acne vulgaris

Additional comments: Specific recommendations are provided below.

² *Guidance on Acyclovir* for acyclovir topical cream, 5%

Analytes to measure (in appropriate biological fluid): Not applicable

Bioequivalence based on (90% CI): Clinical endpoint

Waiver request of in vivo testing: Not applicable

Dissolution test method and sampling times: Not applicable

Additional comments regarding the bioequivalence study with clinical endpoint:

1. The Office of Generic Drugs recommends conducting a bioequivalence study with clinical endpoint in the treatment of acne vulgaris. Subjects are to be randomized to receive the generic clindamycin phosphate; tretinoin gel, 1.2%; 0.025%, the reference product or placebo. An approximately pea sized amount of the study drug is to be topically administered once daily in the evening for 12 weeks. The primary endpoint is to be evaluated at baseline (Day 0) and at the end of treatment (Study Week 12).
2. Inclusion Criteria (the sponsor may add additional criteria):
 - a. Male or nonpregnant, nonlactating female aged ≥ 12 and ≤ 40 years with a clinical diagnosis of acne vulgaris
 - b. On the face, ≥ 25 non-inflammatory lesions (i.e., open and closed comedones) AND ≥ 20 inflammatory lesions (i.e., papules and pustules) AND ≤ 2 nodulocystic lesions (i.e., nodules and cysts)
 - c. Investigator's Global Assessment (IGA) of acne severity Grade 2, 3, or 4 (per Table 1)

Table 1. Sample IGA Scale for Acne Vulgaris³

Grade	Description
0	Clear skin with no inflammatory or noninflammatory lesions
1	Almost clear; rare noninflammatory lesions with no more than one small inflammatory lesion
2	Mild severity; greater than Grade 1; some noninflammatory lesions with no more than a few inflammatory lesions (papules/pustules only, no nodular lesions)
3	Moderate severity; greater than Grade 2; up to many noninflammatory lesions and may have some inflammatory lesions, but no more than one small nodular lesion
4*	Severe; greater than Grade 3; up to many noninflammatory lesions and may have some inflammatory lesions, but no more than a few nodular lesions

³ Guidance for industry *Acne Vulgaris: Establishing Effectiveness of Drugs Intended for Treatment*. Accessed at <https://www.fda.gov/regulatory-information/search-fda-guidance-documents/acne-vulgaris-establishing-effectiveness-drugs-intended-treatment>

* The Case Report Forms for acne studies can allow for reporting by investigators of lesion worsening beyond Grade 4 with treatment. It is recommended that enrollment of acne vulgaris subjects not include subjects with nodulocystic acne. Subjects who worsen beyond Grade 4 are to be described in the safety evaluation.

- d. Willing to refrain from use of all other topical acne medications or antibiotics (other than study treatment) during the 12-week treatment period
 - e. If female of childbearing potential, willing to use an acceptable form of birth control during the study
3. Exclusion Criteria (the sponsor may add additional criteria):
- a. Pregnant, breast feeding or planning a pregnancy
 - b. Crohn's disease, regional enteritis, ulcerative colitis or history of antibiotic-associated colitis
 - c. Presence of any skin condition that would interfere with the diagnosis or assessment of acne vulgaris (e.g., on the face: rosacea, dermatitis, psoriasis, squamous cell carcinoma, eczema, acneform eruptions caused by medications, steroid acne, steroid folliculitis, or bacterial folliculitis)
 - d. Excessive facial hair (e.g., beards, sideburns, moustaches, etc.) that would interfere with diagnosis or assessment of acne vulgaris
 - e. History of hypersensitivity or allergy to tretinoin, retinoids, clindamycin or any of the study medication ingredients
 - f. Use within 6 months prior to baseline of oral retinoids (e.g., Accutane®) or therapeutic vitamin A supplements of greater than 10,000 units/day (multivitamins are allowed)
 - g. Use for less than 3 months prior to baseline of estrogens or oral contraceptives; use of such therapy must remain constant throughout the study
 - h. Use on the face within 1 month prior to baseline of 1) cryodestruction or chemodestruction, 2) dermabrasion, 3) photodynamic therapy, 4) acne surgery, 5) intralesional steroids, or 6) x-ray therapy
 - i. Use within 1 month prior to baseline of 1) spironolactone, 2) systemic steroids, 3) systemic antibiotics, 4) systemic treatment for acne vulgaris (other than oral retinoids, which require a 6-month washout), or 5) systemic anti-inflammatory agents
 - j. Use within 2 weeks prior to baseline of 1) topical steroids, 2) topical retinoids, 3) topical acne treatments including over-the-counter preparations, 4) topical anti-inflammatory agents, or 5) topical antibiotics
4. Subjects should gently wash the face with a mild or soap less, non-medicated cleanser, pat the dry, and then apply approximately a pea-sized amount of study product to lightly cover the entire affected areas of the face once daily in the evening. The subject should be instructed to avoid contact of the study product with any areas of sunburn, open wounds, the corners of the nose, mouth, lips, eyes and mucous membranes, and to wash their hands after application. The subject should be instructed to discontinue the study product and notify the study site if they experience severe diarrhea or gastrointestinal discomfort.

5. Subjects should not apply moisturizers, new brands of make-up, creams, lotions, powders or any topical product other than the assigned treatment to the treatment area. Subjects should minimize exposure to sunlight, including sunlamps, while using the product. A sunscreen should be applied every morning and reapplied over the course of the day as needed. The subject should be instructed to use protective clothing, such as a hat, when they are in the sun.
6. The protocol should include a list of the prescription and over-the-counter drug products, procedures, and activities that are prohibited during the study, such as:
 - a. Any other topical products applied to face
 - b. Medicated or abrasive soaps or cleansers used on face
 - c. Any medication that may increase sensitivity to sunlight
 - d. Oral retinoids, therapeutic vitamin A supplements of greater than 10,000 units/day (multivitamins are allowed) or other systemic treatment for acne vulgaris
 - e. Systemic (e.g., oral or injectable) antibiotics
 - f. Systemic steroids, systemic anti-inflammatory agents or immunosuppressive drugs
 - g. Antipruritics, including antihistamines, within 24 hours of study visits
 - h. Use on the face of 1) cryodestruction or chemodestruction, 2) dermabrasion, 3) photodynamic therapy, 4) acne surgery, 5) intralesional steroids, or 6) x-ray therapy
 - i. Use of tanning booths, sunbathing, or excessive exposure to the sun
7. The recommended two primary endpoints of the study are 1) percent change from baseline to Week 12 in the inflammatory (papules and pustules) lesion counts and 2) percent change from baseline to Week 12 in the non-inflammatory (open and closed comedones) lesion counts. The protocol should clearly define papules, pustules, open comedones, closed comedones, nodules and cysts. When counting facial acne lesions, it is important that all lesions be counted, including those present on the nose. Counts of nodules and cysts should be reported separately and not included in the inflammatory or non-inflammatory lesion counts.
8. Application site reactions such as erythema, dryness, burning/stinging, erosion, edema, pain and itching are to be recorded at each visit to allow a comparison between treatment groups. A descriptive analysis comparing the application site reactions for each treatment group is recommended. It is important to ensure that the test product is not worse than the reference product with regard to the expected and unexpected application site reactions.
9. Please refer to the product-specific guidance on adapalene; benzoyl peroxide topical gel, 0.3%; 2.5% entitled *Guidance on Adapalene; Benzoyl Peroxide* for a recommended approach to statistical analysis and study design for bioequivalence studies with clinical endpoint.
10. Study data should be submitted in a standardized format. Please refer to the study data standards published at www.fda.gov⁴.

⁴ Study Data Standards for Submission to CDER and CBER available at:
<https://www.fda.gov/industry/study-data-standards-resources/study-data-submission-cder-and-cber>