

Topical Retinoids Versus Benzoyl Peroxide in Acne Maintenance Therapy: Comparative Role, Evidence, And Practical Use

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ABSTRACT

Acne vulgaris is a chronic inflammatory disorder with a high tendency for relapse after initial improvement. Maintenance therapy is therefore essential to prevent recurrence, reduce new lesion formation, minimize scarring, and maintain long-term disease control. Topical retinoids and benzoyl peroxide are two major non-antibiotic agents used in acne treatment, but they have different roles in maintenance. Topical retinoids are generally considered the core maintenance therapy because they target microcomedone formation, normalize follicular keratinization, and prevent the development of both comedonal and inflammatory lesions. Benzoyl peroxide provides antimicrobial and anti-inflammatory activity without inducing bacterial resistance and is especially useful when inflammatory relapse remains a concern. However, benzoyl peroxide alone is less often positioned as the primary long-term maintenance agent compared with topical retinoids. Current evidence suggests that retinoid-benzoyl peroxide combinations may offer the strongest relapse prevention, particularly in patients with moderate-to-severe acne, recent isotretinoin therapy, or high risk of recurrence. This review compares topical retinoids and benzoyl peroxide for acne maintenance, emphasizing mechanism of action, efficacy, tolerability, relapse prevention, combination therapy, and practical selection.

KEYWORDS: acne vulgaris; maintenance therapy; topical retinoids; benzoyl peroxide; adapalene; relapse prevention; acne recurrence; combination therapy..

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INTRODUCTION

Acne vulgaris is a chronic disease rather than a short-term cosmetic condition. Even after successful initial treatment, relapse is common if maintenance therapy is discontinued. Maintenance treatment aims to suppress new lesion formation, prevent inflammatory recurrence, reduce the need for repeated oral antibiotics, and protect against scarring and post-inflammatory pigmentary changes.

Topical retinoids and benzoyl peroxide are central non-antibiotic therapies in acne care. Both are useful in active treatment, but their roles in maintenance differ. Retinoids are generally favored as the main long-term maintenance agents because they prevent microcomedone formation, which is the precursor lesion of acne. Benzoyl peroxide is valuable because of its antimicrobial and anti-inflammatory effects, especially in patients prone to inflammatory flares or those previously treated with topical or oral antibiotics [1–3].

The strongest practical approach is often not retinoid versus benzoyl peroxide as isolated monotherapy, but rather retinoid-based maintenance with benzoyl peroxide added when inflammatory relapse prevention is needed [2,3].

METHODS

This narrative review was developed from the uploaded literature synthesis comparing topical retinoids and benzoyl peroxide in acne maintenance. The evidence included reviews, guideline-based recommendations, maintenance studies, randomized trials, observational comparisons, systematic reviews, and combination-therapy analyses.

References are numbered according to their first appearance in the manuscript.

Rationale for Acne Maintenance Therapy

Maintenance therapy is necessary because acne pathogenesis persists even after visible improvement. Follicular

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hyperkeratinization, androgen-driven sebum production, Cutibacterium acnes activity, and inflammation may continue beneath clinically improved skin.

Without maintenance, patients may experience:

New comedone formation

Inflammatory papules and pustules

Nodular relapse

Post-inflammatory hyperpigmentation

Scarring

Repeated need for antibiotics

Reduced adherence due to recurrent flares

An ideal maintenance agent should be effective, safe for long-term use, non-antibiotic, well tolerated, affordable, and easy to apply.

Topical Retinoids in Maintenance

Topical retinoids are widely regarded as the foundation of acne maintenance therapy. Common agents include adapalene, tretinoin, tazarotene, and trifarotene.

Mechanism of Action

Retinoids act primarily by:

Normalizing follicular keratinization

Preventing microcomedone formation

Reducing comedones

Decreasing inflammatory signaling

Enhancing penetration of other topical agents

Preventing new lesion development

This mechanism is particularly important for maintenance because relapse begins with microscopic follicular obstruction before inflammatory lesions become clinically visible.

Clinical Role

Topical retinoids are useful after successful treatment with:

Topical combination therapy

Oral antibiotics

Hormonal therapy

Oral isotretinoin

Procedural therapy

They are especially appropriate for patients with comedonal acne, mixed comedonal-inflammatory acne, recurrent acne, and patients needing long-term non-antibiotic control [1,2].

Advantages

Strong relapse-prevention rationale

Useful for both treatment and maintenance

Non-antibiotic mechanism

Effective against comedonal and inflammatory lesions

Compatible with long-term use

Helps reduce reliance on antibiotics

Limitations

The main limitation is irritation, especially during early use. Patients may develop erythema, dryness, peeling, burning, or stinging. These effects can reduce adherence if not anticipated.

Tolerability can be improved by gradual initiation, moisturizer use, lower concentration selection, alternate-

night application, and avoiding excessive product amount. Topical retinoids are generally avoided during pregnancy.

Benzoyl Peroxide in Maintenance

Benzoyl peroxide is an antimicrobial and anti-inflammatory topical agent with an important role in acne management.

Mechanism of Action

Benzoyl peroxide works by:

Reducing C. acnes through oxidative activity

Decreasing inflammatory lesions

Providing mild keratolytic effects

Reducing antibiotic-resistant bacterial selection when combined with antibiotics

Unlike topical or oral antibiotics, benzoyl peroxide does not induce bacterial resistance.

Clinical Role

Benzoyl peroxide may be used in maintenance when inflammatory lesions remain a concern. It is especially helpful for patients with:

Inflammatory relapse tendency

Prior oral antibiotic use

Prior topical antibiotic use

Papulopustular acne

Truncal acne

Need for non-antibiotic antimicrobial activity

However, the maintenance literature generally positions benzoyl peroxide as an adjunct to retinoids rather than as the main long-term maintenance agent [1,3,4].

Advantages

Rapid antimicrobial effect

No bacterial resistance

Useful in inflammatory acne

Supports antibiotic stewardship

Available in multiple formulations and concentrations

Limitations

Benzoyl peroxide may cause dryness, irritation, peeling, stinging, and bleaching of clothes or towels. As monotherapy, it does not target microcomedone formation as directly as retinoids, which limits its role as a sole maintenance agent.

Direct Comparison: Retinoids Versus Benzoyl Peroxide

Direct head-to-head maintenance trials comparing retinoid-only therapy with benzoyl peroxide-only therapy are limited. Therefore, conclusions rely on mechanism, active-treatment trials, maintenance studies, and guideline interpretation.

The available evidence suggests:

Topical retinoids are better aligned with long-term relapse prevention because they target microcomedones and new lesion formation.

Benzoyl peroxide is valuable for inflammatory control and antimicrobial activity.

Short-term monotherapy comparisons may show similar efficacy in some mild-to-moderate acne populations, but this does not establish benzoyl peroxide as superior for maintenance.

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Lesion type matters: retinoids may be preferred for comedonal and mixed acne, while benzoyl peroxide may be added for inflammatory-predominant relapse [4–6].

Thus, the practical answer is not that benzoyl peroxide is ineffective, but that topical retinoids usually fit the maintenance phase better.

Retinoid–Benzoyl Peroxide Combination Therapy

Combination therapy provides the strongest rationale for relapse prevention because it targets multiple acne pathways simultaneously.

A retinoid–benzoyl peroxide regimen combines:

Comedogenesis prevention from the retinoid

Antimicrobial effect from benzoyl peroxide

Anti-inflammatory effects from both agents

Antibiotic-sparing maintenance

The strongest maintenance-specific evidence supports adapalene 0.1%/benzoyl peroxide 2.5% after oral isotretinoin, with low relapse rates over 12 months in one study [2]. Reviews also support adapalene/benzoyl peroxide maintenance for continued symptom reduction and relapse prevention after initial clearance [3].

Combination therapy is particularly useful for:

Moderate-to-severe acne after improvement

Patients after oral isotretinoin

Patients with frequent relapse

Inflammatory acne with comedonal background

Patients trying to avoid repeated antibiotic courses

The main drawback is tolerability. Combination products may increase dryness, erythema, burning, and stinging, especially early in treatment. Gradual use and moisturization are important.

Tolerability and Adherence

Maintenance therapy only works if patients continue using it. Irritation is one of the most common causes of nonadherence.

Strategies to improve adherence include:

Explain that acne maintenance prevents invisible early lesions.

Use a pea-sized amount for the entire face.

Start every other night if irritation occurs.

Apply moisturizer before or after treatment.

Use gentle cleanser and sunscreen.

Avoid scrubs, harsh toners, and over-washing.

Reduce benzoyl peroxide concentration if dryness is excessive.

Simplify the regimen whenever possible.

Adapalene is often considered one of the better-tolerated retinoids, which may make it useful for maintenance, particularly in fixed combinations [7].

Maintenance After Oral Antibiotics

After oral antibiotics are discontinued, maintenance should not rely on topical antibiotics alone. A topical retinoid with or without benzoyl peroxide is preferred.

Benzoyl peroxide is particularly useful in this setting because it reduces antibiotic-resistant *C. acnes* selection and provides

non-antibiotic antimicrobial activity. Retinoids maintain follicular normalization and prevent new comedone formation.

A practical post-antibiotic regimen may include:

Night: topical retinoid

Morning: benzoyl peroxide wash or gel

Alternative: fixed-dose adapalene/benzoyl peroxide

Maintenance After Isotretinoin

Oral isotretinoin can induce long-term remission, but relapse may still occur. Maintenance therapy may be considered in patients at high relapse risk, including younger patients, severe baseline acne, truncal involvement, persistent seborrhea, or incomplete cumulative response.

Adapalene/benzoyl peroxide has evidence supporting relapse prevention after isotretinoin, with low relapse rates reported over 12 months in a maintenance study [2].

Topical retinoid-based maintenance after isotretinoin is especially logical because it prevents microcomedone reformation without using antibiotics.

Special Populations

Sensitive Skin

Patients with sensitive skin may need slower introduction, lower concentrations, and moisturizer-supported therapy. A retinoid alone may be started first, with benzoyl peroxide added later if inflammatory relapse occurs.

Skin of Color

Acne in skin of color often produces post-inflammatory hyperpigmentation. Retinoids may help reduce comedonal activity and improve epidermal turnover, while benzoyl peroxide helps inflammatory lesion control. Irritation should be minimized because irritation can worsen dyspigmentation.

Pregnancy

Topical retinoids are generally avoided during pregnancy. Benzoyl peroxide may be considered in limited use depending on clinical judgment, but pregnancy-specific treatment should be individualized.

Truncal Acne

Benzoyl peroxide washes are practical for truncal acne because they can cover large areas. Retinoids may also be used, but irritation and application burden can limit adherence.

Practical Treatment Selection

When to Prefer a Topical Retinoid

A topical retinoid is usually preferred when:

Long-term maintenance is the goal.

Comedones are prominent.

Acne relapses after stopping therapy.

The patient has mixed comedonal-inflammatory acne.

Antibiotic avoidance is desired.

The patient is not pregnant or trying to conceive.

When to Add Benzoyl Peroxide

Benzoyl peroxide should be added when:

Inflammatory papules or pustules persist.

The patient recently used oral or topical antibiotics.

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Relapse is inflammatory rather than comedonal.

Truncal acne is present.

A stronger maintenance regimen is needed.

When Combination Therapy Is Best

Retinoid–benzoyl peroxide combination therapy is most appropriate when:

Acne was moderate-to-severe before control.

The patient has frequent relapse.

Isotretinoin was recently completed.

Antibiotic-sparing control is a priority.

The patient can tolerate combination topical therapy.

Proposed Maintenance Algorithm

Confirm acne control after induction therapy.

Assess relapse pattern: comedonal, inflammatory, mixed, truncal, or hormonally influenced.

Use topical retinoid as the core maintenance agent for most nonpregnant patients.

Add benzoyl peroxide if inflammatory relapse risk is present.

Use fixed retinoid–benzoyl peroxide combination for moderate-to-severe or relapse-prone acne.

Avoid topical antibiotic maintenance monotherapy.

Adjust frequency for tolerability.

Continue moisturizer, sunscreen, and gentle cleanser.

Reassess after 8–12 weeks and simplify if stable.

Continue long term when relapse risk remains high.

DISCUSSION

Topical retinoids and benzoyl peroxide are both essential in acne care, but their maintenance roles are not identical. Retinoids are better suited as the foundation of maintenance because they prevent microcomedones, the earliest acne lesion. This makes them useful even when the skin appears clinically clear.

Benzoyl peroxide is valuable because it controls inflammatory and bacterial components without promoting resistance. However, as monotherapy, it does not address the comedogenic pathway as comprehensively as retinoids. Therefore, benzoyl peroxide alone is usually not the preferred long-term maintenance strategy unless retinoids are not tolerated or contraindicated.

The most effective maintenance strategy for many patients is combination therapy. Retinoid–benzoyl peroxide combinations prevent new lesions through complementary mechanisms and may be especially useful after isotretinoin or systemic antibiotics. The tradeoff is irritation, which must be managed proactively.

Overall, current evidence supports a retinoid-centered maintenance approach, with benzoyl peroxide added according to inflammatory relapse risk and tolerability.

CONCLUSION

Topical retinoids generally have stronger support than benzoyl peroxide alone as maintenance therapy for acne vulgaris because they prevent microcomedone formation and

new lesion development. Benzoyl peroxide remains important for inflammatory relapse prevention, antimicrobial activity, and antibiotic stewardship. Direct head-to-head maintenance evidence is limited, but available studies and guideline-based recommendations favor retinoid-based maintenance, particularly when long-term relapse prevention is the goal. Retinoid–benzoyl peroxide combinations appear to provide the strongest maintenance strategy for relapse-prone patients, especially after moderate-to-severe acne, oral antibiotics, or isotretinoin. Treatment should be individualized according to lesion type, tolerability, pregnancy status, relapse pattern, and adherence.

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