Study: Glycerin In Personal Lubricants & Its Effect On Vaginal Tissue Damage

An independent investigation, clinical review, and public expose calling for action from medical professionals, manufacturers, and lawmakers.

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Table of Contents

Has Glycerin Burned You Or Someone You Know?

If you've used personal lubricants in the past decade, you might have been exposed to high levels of glycerin — a chemical compound that, in elevated concentrations, may cause irritation or even chemical burns to sensitive vaginal tissue.

This article was born from firsthand experience. After years of battling vaginal dryness, discomfort, and stinging — and being handed product after product by doctors that only made things worse — the author began digging into the research. What started as personal investigation turned into something deeper: a study of how one widely used ingredient could be quietly harming countless women.

What Is Glycerin?

Glycerin, also known as glycerol, is a colorless, odorless, viscous liquid widely used in pharmaceuticals and personal care products. It serves as a humectant and is commonly found in lotions, soaps, and lubricants. In theory and practical applications in topical moisturizers typically used on your face and non-mucous membrane areas, glycerin is added to draw moisture to the skin.

Typical Glycerin Concentrations in Cosmetics

In most cosmetic products, glycerin is used at concentrations between **3% and 5%**. This range is generally considered safe and effective for moisturizing purposes.

How Glycerin Is Intended to Act in Low Concentrations

Glycerin pulls moisture from the air and any surface it contacts, like skin. In moist climates, it can draw in moisture from the air and, in theory, deposit that moisture into the skin when in low concentrations. However, when not in a humid environment — and especially in concentrations higher than 5% — glycerin begins to pull moisture *from* the skin rather than deposit it.

High Glycerin Levels and Potential Risks

Some personal lubricants contain glycerin concentrations of **30% or higher**. Elevated levels of glycerin can increase the **osmolality** of the product, leading to cellular dehydration and potential damage to vaginal tissues. High-osmolality lubricants have been associated with epithelial cell damage and increased susceptibility to infections. Thus, in addition to being in a dry environment, higher concentrations of glycerin will further pull moisture from the skin — resulting in dryness, irritation, and even burns.

Reported Reactions to Glycerin-Based Lubricants

Many women report immediate **burning**, **stinging**, or **rawness** after using personal lubricants containing high concentrations of glycerin. These sensations are not merely signs of "sensitivity" — they often indicate **cellular dehydration** and tissue irritation due to glycerin's high osmolality.

In addition to surface-level discomfort, studies have shown that such lubricants can disrupt the natural balance of vaginal flora, increasing the risk of **bacterial vaginosis**. Glycerin's sugar-like structure may also promote the growth of **Candida**, leading to a heightened risk of **yeast infections** — especially in women already prone to them.

Stinging Isn't "Sensitivity" — It's Your Nerve Endings Reacting to Dehydration

When a lubricant causes **stinging or burning** upon contact with vaginal tissue, it's often brushed off as the user being "sensitive." But that explanation ignores the underlying biology.

The reality is this: **Stinging is a neurological response to active tissue distress.** In the case of high-glycerin lubricants, it's the result of **osmotic dehydration** — a process where moisture is pulled *out* of your cells due to the high solute concentration of the product.

Your vaginal lining contains **dense nerve endings**, particularly around the entrance and vestibule. When cells begin rapidly losing moisture, those nerves respond the same way they would if you were being exposed to heat or abrasion: with a pain signal.

This isn't hypothetical. Studies on hyperosmolar lubricants have shown that they can cause **epithelial cell damage**, thinning of the protective layer, and increased vulnerability to infection. The body recognizes this damage in real time — and the result is that sharp, stinging sensation.

In other words, that "sensitivity" isn't about your body being too delicate.
It's about your body trying to protect you.

High Levels of Propylene Glycol and Potential Risks

A report from the National Library of Medicine indicates that while generally considered safe, when high levels of propylene glycol enter the bloodstream of 900 mg or more, it can result in toxic reactions like hyperosmolarity, hemolysis, cardiac arrhythmia, seizures, agitation, and lactic acidosis.

Why Are Glycerin & Propylene Glycol Still Used in So Many Lubricants?

The simple answer? They're **cheap**, effective on paper, and easy to work with. Glycerin is a common humectant — meaning it draws moisture — and it helps give lubricants a slippery, smooth texture. It's shelf-stable, blends easily with water, and adds a sweet taste to flavored lubes. From a manufacturing standpoint, it's a dream ingredient.

Propylene glycol is often used for similar reasons. It’s a solvent and humectant that helps ingredients blend uniformly, prevents freezing, and creates a slick feel. It's frequently found in industrial and cosmetic products because it's inexpensive and very adaptable. In cheaper lube formulas, it's favored for its ability to mimic moisture and preserve consistency over time without separating or requiring refrigeration.

But from a user safety standpoint — particularly when used in high concentrations — it can be a nightmare. Both ingredients, especially when misused, have been linked to tissue irritation, increased infection risk, and even chemical burns on sensitive mucosal areas like the vagina and rectum.

So the **bigger questions** become:

- Do these manufacturers know it causes issues?
- And if so, why are they still using it — especially in vaginal products marketed to women with dryness, irritation, or menopause symptoms?
- Is it a lack of up-to-date medical awareness?
- Or is it simply easier to keep using what’s cheap and familiar — even if women are being harmed?

These are the questions we should all be asking. And until companies start answering them, women deserve to be warned.

Conclusion

While glycerin is a common ingredient in many personal care products, its concentration in personal lubricants warrants attention. If you've experienced irritation or other adverse reactions, consider checking the ingredients of your lubricant and consult with a healthcare professional for guidance.

A Call to Action

As women, we deserve products that nourish and protect our bodies — not formulas that quietly damage us while calling it "normal."

Here's what needs to happen next:

Researchers Must Investigate the Long-Term Risks

We need clinical studies examining whether high-glycerin lubricants contribute to vaginal atrophy, chronic dryness, or epithelial breakdown. This topic has been ignored for far too long — and the silence has harmed countless women.

Doctors Must Educate Themselves — and Their Patients

Medical professionals need to understand how osmolality and glycerin affect vaginal health. Recommending over-the-counter products without understanding their formulations is no longer acceptable. If a patient complains of stinging or discomfort, the response shouldn't be dismissal — it should be investigation and guidance.

Clinical Use of Glycerin & Propylene Glycol-Based Lubricants Must Stop

Medical providers and healthcare facilities must also re-evaluate the lubricants used in pelvic exams, transvaginal ultrasounds, catheter insertions, and other internal procedures. Many sterile lubricants used in clinical settings contain high levels of glycerin and may cause tissue damage over time—especially with repeated exposure. These products are not exempt from scrutiny simply because they're labeled "sterile."

We urge hospitals, OB/GYN clinics, and outpatient centers to prioritize patient safety by phasing out high-glycerin formulas and adopting safer alternatives—particularly for procedures involving vaginal or rectal mucosa.

Medical Schools Must Update Their Curricula

It's not enough for practicing doctors to educate themselves — this information needs to be built into medical training. Universities and residency programs must start teaching future OB-GYNs, nurse practitioners, and general physicians about the risks of high-glycerin products, especially in relation to vaginal health, mucosal hydration, and menopause care. Vaginal stinging

and atrophy shouldn't be treated like mysteries — they're often preventable. It's time medical education caught up to the real-world experiences of women.

Women Deserve to Know What That Stinging Means

That sharp, burning sensation so many women feel after using certain products? It's not just "sensitivity." It's the direct result of moisture being pulled from your cells. It's not in your head. It's your body trying to tell you something is wrong.

It's Time for Labeling Laws to Catch Up

If a product contains high concentrations of glycerin — especially when intended for vaginal use — it should be required by law to carry a clear warning. Just like cigarette labels or food allergens, women deserve to be warned when something may harm the most sensitive part of their body. If companies won't do it voluntarily, then it's time for legislation that makes them.

Manufacturers Must Be Transparent

Any product containing 30% or more glycerin or any amount of propylene glycol should be required to carry a warning label. Women deserve to know when a product may cause cellular dehydration or irritation — especially when applied to the most sensitive and absorbent part of the body.

Retail Platforms Must Flag Products with Glycerin and Propylene Glycol

Just like food products require allergen warnings, online retailers like Amazon, Walmart, and Target should be required to visibly flag personal lubricants that contain high concentrations of glycerin as well as any amount of propylene glycol. These platforms profit from selling products that may harm women's intimate health — they have a responsibility to inform buyers of potential risks. If they can flag items for allergies, cancer risks, or shipping delays, they can certainly add a glycerin risk notification to vaginal products.

Mainstream Media Must Help Spread the Message

We urge journalists, editors, content creators, and health reporters to help bring visibility to this issue. Millions of women are affected by these products, often without understanding the risks. By reporting on this study and the broader lack of transparency in the personal lubricant industry, you can help spark overdue conversations, influence public health awareness, and push for industry change.

References:

Claim: Glycerin is a Chemical Compound

Glycerin, also known as glycerol, is a simple polyol compound with the chemical formula $C_3H_8O_3$. It is a colorless, odorless, viscous liquid that is widely used in pharmaceutical formulations. Glycerin is a sugar alcohol, and is sweet-tasting and of low toxicity. Chemondis BlogWikiDoc+1Wikipedia+1

The American Chemical Society (ACS) also recognizes glycerol as a chemical compound, detailing its synthesis and applications in various industries. American Chemical Society

Furthermore, the National Institute of Standards and Technology (NIST) provides detailed chemical and physical property data for glycerin, affirming its status as a chemical substance. NIST WebBook

These sources confirm that glycerin is a well-characterized chemical compound with established properties and uses across multiple industries.

Claim: Glycerin in 3-5% Formulations Commonality

Typical Glycerin Concentrations in Moisturizers

According to a study published in the *Journal of Cosmetic Dermatology*, glycerin is commonly incorporated into cosmetic products at concentrations ranging from 1% to 5%. Higher concentrations can leave a sticky feeling on the skin, which is generally perceived as unpleasant. CosmEthically ACTIVE certificate

Potential Irritation at Higher Concentrations

While glycerin is recognized for its moisturizing properties, excessive concentrations can lead to adverse effects. A study published in the *International Journal of Cosmetic Science* found that a 10% glycerin solution caused slight irritation in a 48-hour occlusive patch test, indicating that

higher concentrations may not be suitable for all skin types. Safety Assessment of Glycerin as Used in Cosmetics

Furthermore, the *American Academy of Allergy, Asthma & Immunology* notes that reactions to glycerin are typically irritant responses, and reducing the concentration of glycerin usually alleviates the intolerance. AAAAI

Claim: Glycerin over 30% Concentration Can Cause Skin Burns & Irritation

The following are resources supporting the claim that high concentrations of glycerin can cause burns on vaginal skin.

- **Myrto Natural Cosmetics** notes that glycerin can have a drying effect and irritate mucous membranes at very high concentrations, specifically above 30%. myrto-naturalcosmetics.de
- **Healthline** indicates that undiluted or insufficiently diluted glycerin can dehydrate the skin, potentially leading to blistering, especially in low-humidity conditions. Healthline+1Verywell Health+1
- **Verywell Health** reports that severe dehydration of the skin could result in blistering when using pure glycerin, emphasizing the importance of dilution. Verywell Health
- **Cosmetics and Skin** highlights that applying undiluted glycerin to chapped skin can exacerbate the condition, causing a burning sensation. cosmeticsandskin.com

Claim: Women Reporting Irritation & Discomfort Related to Glycerin in Personal Lubricants

Clinical and Laboratory Findings

- **Hyperosmolar Lubricants and Vaginal Tissue Damage**: A study published in *Environmental Health Perspectives* found that many personal lubricants are hyperosmolar, meaning they have a higher concentration of solutes than vaginal fluids. This can lead to epithelial cell damage and increased susceptibility to infections. Glycerin, a common ingredient, contributes to this hyperosmolarity. PMC
- **Impact on Vaginal Microbiota**: Research in the journal *Contraception* demonstrated that certain lubricants, including those containing glycerin, can disrupt the growth of beneficial vaginal Lactobacillus species. This disruption can lead to an imbalance in the vaginal microbiome, potentially causing irritation and increasing the risk of infections. PMC

Clinical Recommendations and Observations

- **Stanford Health Care Guidance**: Dr. Leah Millheiser from Stanford Health Care advises that glycerin can cause yeast infections and recommends that individuals prone to such infections should opt for glycerin-free lubricants. Obstetrics & Gynecology
- **University of Michigan Rogel Cancer Center**: Their guide on improving sexual health suggests avoiding lubricants containing glycerin, as well as flavored or warming lubricants, since they may cause irritation. Rogel Cancer Center

Consumer Reports and Expert Opinions

- **Healthline**: An article on Healthline notes that glycerin, among other ingredients, can cause inflammation or irritation and should be avoided by people prone to vaginal infections or who have sensitive skin. Healthline
- **SELF Magazine**: SELF highlights that glycerin, a common ingredient in lubricants, can lead to yeast infections in some women and advises caution for those with sensitive vaginas or a history of infections. SELF

Claim: A Single Use of a Personal Lubricant with Propylene Glycol Can Potentially Expose You to 4-5000 mg, of which 900 mg can be toxic.

Referencing the information at: https://www.ncbi.nlm.nih.gov/articles/PMC4341412/

And estimating that the average person uses about 1 tablespoon of lube per use, my hypothesis was formed with this logic:

1. **18 mg/dL** means 18 milligrams of PG per deciliter of blood. The average adult has around **50 deciliters of blood** — so:
   18 mg/dL × 50 dL = **900 mg** of PG in total circulation before it hits potential toxicity risk.

2. **How much PG is in a typical lube dose?** Let's say someone uses 1 tablespoon of lube (about **15 mL**). If the lube is **~30% PG by volume** (which is plausible for some formulas), that's:
   15 mL × 0.30 = **4.5 mL of PG**

3. PG has a density of **~1.036 g/mL**, so:
   4.5 mL × 1.036 g/mL = **~4.66 grams** of PG

4. Thus, **one typical application of lube could contain 4,000–5,000 mg of propylene glycol** — far exceeding the **900 mg threshold** noted in the study.

Claim: Stinging Isn't "Sensitivity" — It's Your Nerve Endings Reacting to Dehydration

Medical Evidence Supporting Tissue Damage from Hyperosmolar Lubricants

- **Epithelial Damage and Barrier Disruption**: A study published in the *Journal of Infectious Diseases* found that hyperosmolar lubricants, which often contain high concentrations of glycerin, can cause epithelial damage in the distal colon, suggesting similar effects could occur in vaginal tissues. The study noted that such damage could increase susceptibility to infections. SAGE Journals+1PMC+1
- **Cytotoxicity and Tissue Irritation**: Research published in *PLOS ONE* evaluated over-the-counter personal lubricants and found that hyperosmolar lubricants were associated with cellular toxicity and epithelial damage, while iso-osmolar lubricants did not show these adverse effects. PLOS+1IMR Press+1
- **Impact on Vaginal Microbiota**: A study in the *Journal of Sexual Medicine* highlighted that lubricants with high osmolality can disrupt the natural balance of vaginal flora, potentially leading to conditions like bacterial vaginosis.

World Health Organization (WHO) Recommendations

The WHO recommends that personal lubricants should have an osmolality of ≤380 mOsm/kg to minimize the risk of epithelial damage. However, many commercially available lubricants, especially those containing glycerin, exceed this threshold, with some products having osmolality levels several times higher. PMC+1Rogel Cancer Center+1

Conclusion

The stinging and burning sensations reported by users of high-glycerin lubricants are not merely signs of sensitivity but are indicative of underlying tissue damage and dehydration caused by hyperosmolar formulations. These findings underscore the importance of choosing lubricants with appropriate osmolality levels to maintain vaginal health and prevent discomfort.

About the Author

Christie Templeton, founder of Wet Orchid, is a prior Technical Writer and Business Analyst who after experiencing menopause, vaginal atrophy, and trying different products that caused irritation, she began researching and formulating her own products which she has since began producing for other women. She spent 2 years researching, writing, and formulating using the same resources that medical professionals use to find solutions for women that go beyond the limited knowledge that is shared about women's intimate health and the lack of women made products in an industry dominated by male-ran manufacturers.

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