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When Treatment Becomes Harm: Topical Corticosteroid Misuse, Long-Term Benzodiazepine Dependence, and the Challenges of Medication Safety—A Review

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A R T I C L E I N F O

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A B S T R A C T

Background: Topical corticosteroids and benzodiazepines are valuable treatments whose risks can become more consequential under inappropriate exposure or inadequate monitoring. Objective: To interpret contemporary evidence on topical betamethasone misuse and long-term clonazepam-related risk through an integrated medication-safety lens. Methods: A qualitative literature review synthesised peer-reviewed research and guidance published from 2020 to 2026, comparing pharmacological mechanisms, clinical complications, behavioural determinants and prevention strategies. Results: Inappropriate topical corticosteroid exposure can alter the appearance of dermatophyte infection and contribute to local adverse effects, whereas prolonged benzodiazepine use raises different concerns about sedation, neuroadaptation, physical dependence and withdrawal. Across both cases, diagnostic uncertainty, inadequate counselling and discontinuous review can aggravate risk. Physical dependence must not be confused with addiction, and safety messages should not encourage abrupt benzodiazepine cessation. Discussion: An exposure–context–harm–stewardship framework integrates drug-specific biological pathways with shared health-system vulnerabilities. Conclusions: Medication safety requires indication-sensitive prescribing, patient-centred communication, longitudinal reassessment and carefully supported treatment changes. The framework merits prospective and implementation-focused evaluation

INTRODUCTION

Medicines offer a remarkable capacity to relieve symptoms, prevent complications and preserve human functioning. Their benefits, however, depend on the relationship between the indication, the drug, the formulation, the patient and the circumstances of use. A medication that is effective under one set of conditions can generate avoidable harm when exposure continues beyond an appropriate interval, the diagnosis changes, monitoring fails or access bypasses suitable clinical assessment. This proposition is especially important for drugs whose effects are noticeable quickly: symptomatic improvement may be interpreted as proof that longer or more frequent use is necessarily better. The resulting problem should be framed as a failure of medication stewardship rather than as evidence that an entire therapeutic class is inherently dangerous (Sidbury et al., 2023; Brandt et al., 2024; Brunner et al., 2025).

Two apparently unrelated medicines illustrate the complexity of this issue. Betamethasone is a potent glucocorticoid in several topical preparations used for selected inflammatory skin diseases; clonazepam is a benzodiazepine whose anticonvulsant and anxiolytic effects arise through modulation of inhibitory neurotransmission. The first mainly raises concerns about local exposure, diagnostic masking, cutaneous reactions and inappropriate use against infectious rashes. The second invites consideration of neuroadaptation, sedative effects, physical dependence and withdrawal risks. The purpose of putting these cases alongside each other is not to imply pharmacological similarity but to examine the conditions under which legitimate therapy becomes poorly controlled therapy (Nowowiejska, Baran and Flisiak, 2022; Brunner et al., 2025).

The distinction between misuse and expected adverse effects requires attention. A local adverse reaction may occur during correctly indicated treatment; conversely, a patient may use a prescribed medicine outside the recommended schedule without experiencing measurable harm. In dermatology, an altered clinical appearance of a dermatophyte infection after steroid exposure is not the same event as a newly acquired microbial infection. In benzodiazepine care, physical dependence may arise during prescribed treatment and is not sufficient to diagnose addiction. Treating these phenomena as interchangeable produces stigma, sensationalised health messages and potentially unsafe responses, especially if patients discontinue established sedative treatment abruptly (Nowowiejska, Baran and Flisiak, 2022; Brandt et al., 2024; Brunner et al., 2025).

Recent dermatology research demonstrates that concerns about corticosteroid adverse effects coexist with corticosteroid phobia, which may undermine adequate control of eczema and other inflammatory disease. Studies of patient perceptions and adherence indicate that health communication must convey both appropriate caution and confidence in evidence-based use. Meanwhile, investigations of benzodiazepine prescribing describe persistent long-term use despite guidelines recommending regular reassessment in many anxiety and insomnia presentations. These observations suggest a broader problem of communication, medication review and follow-up rather than a

single category of reckless patients or prescribers (Kew et al., 2023; Albogami et al., 2023; Weleff et al., 2024; Egeberg et al., 2024).

This qualitative literature review addresses seven linked questions formulated at the research-design stage. It examines the benefits and risks of each medicine, identifies the different pathways of injury, analyses behavioural and structural determinants of problematic exposure, and considers prevention through shared decision-making, professional stewardship and health-system support. A cross-drug comparison is useful precisely because the biology differs: identifying what remains common across such contrasting cases provides a more discriminating account of preventable harm. The review accordingly proposes an exposure-context-harm-stewardship framework, presenting it as an interpretive synthesis requiring future validation rather than an established predictive instrument (Brandt et al., 2024; Van Ngoc et al., 2025).

LITERATURE REVIEW

Topical corticosteroids interact with intracellular glucocorticoid receptors and modulate inflammatory signalling, cytokine production and local immune activity. Their therapeutic efficacy in atopic dermatitis and other corticosteroid-responsive disorders is well established; the appropriate product depends on diagnosis, anatomical site, patient age, formulation, potency and intended exposure. Betamethasone is not a single uniform intervention: esters, vehicles and concentrations produce different potency and absorption characteristics. Clinical recommendations therefore cannot be inferred from a photograph of a tube or its nominal percentage alone. Guideline-based treatment is designed to optimise disease control while minimising cumulative exposure and unnecessary use on susceptible skin (Sidbury et al., 2023; Egeberg and Thyssen, 2024; Saeki et al., 2025).

The risk of cutaneous complications is shaped by a combination of pharmacology and environment. Inflamed or damaged skin may differ in absorption from intact skin, while occlusion, frequent application, sensitive sites and prolonged use can change the expected effects. Reported complications include skin thinning, telangiectatic changes, acneiform eruptions, striae and altered presentation of infection. The evidentiary strength varies across outcomes, populations and formulations; adverse-event surveys cannot by themselves establish the risk attributable to one named brand. An adequate synthesis must separate biological plausibility from the frequency of harm demonstrated in prospective data (Egeberg et al., 2024; DiRuggiero and DiRuggiero, 2025; Makwana et al., 2022).

Clonazepam enhances the action of gamma-aminobutyric acid (GABA) through the benzodiazepine-sensitive GABA-A receptor complex, changing neuronal excitability and producing anticonvulsant and sedative effects. It has recognised roles in epilepsy and selected other disorders, but clinical decisions depend on the indication and availability of alternatives. Long-term exposure requires attention to daytime somnolence, psychomotor slowing, interactions with alcohol or opioids, functional outcomes and the possibility that benefits change over time. A general statement that every chronic prescription is

inappropriate overlooks specialist indications and the patient-specific reasons that may support continuation (Brandt et al., 2024; Brunner et al., 2025; Zgierska, Boyle and Conigliaro, 2025).

Tolerance describes a reduced response to some effects after repeated exposure; physiological dependence reflects adaptation such that dose reduction or cessation can precipitate withdrawal. Neither phenomenon automatically establishes a substance use disorder, which involves behavioural and functional diagnostic criteria. Patients who have followed instructions may nonetheless experience difficult withdrawal and require gradual, supported adjustment. Conversely, not all individuals develop comparable symptoms, and duration alone does not fully determine clinical risk. This conceptual precision is essential to preserve trust and avoid framing a therapeutic complication as evidence of moral or personal failure (Baldwin, 2022; Brandt et al., 2024; Brunner et al., 2025).

1. Patient Behaviour and Systems Thinking

Medication-related behaviour does not occur in a social vacuum. Patients interpret symptoms, costs, online information and professional advice through existing beliefs about safety and effectiveness. An individual with an inflammatory rash may seek rapid cosmetic improvement, repeat an old prescription or obtain a topical combination product without diagnostic review. A patient using clonazepam may continue because symptoms recur, appointments are difficult to access or the possibility of withdrawal has never been explained. Both situations reveal the limits of purely individualised accounts of misuse and support analysis of information asymmetry, continuity of care, retail availability and prescribing cultures (Qeyam et al., 2025; Peñarrubia-María et al., 2025; Krüger et al., 2025).

The contrasting phenomenon of steroid phobia further illustrates why risk messages require balance. Some patients overuse topical corticosteroids, whereas others avoid indicated medication because they fear dependence, thinning or systemic toxicity. Failure to treat active inflammation may perpetuate symptoms and further weaken trust in prescribed regimens. Survey research among caregivers and patients identifies variation in knowledge and adherence, suggesting that counselling should address actual potency, appropriate amount, treatment site and anticipated duration rather than rely on broad reassurances or frightening warnings. Medication stewardship is therefore a communication function as well as a prescribing function (Tangthanapalakul et al., 2023; Albogami et al., 2023; Kew et al., 2023; Christensen et al., 2024).

A systems view attributes preventable harm to interacting layers rather than a single error. At the clinician level, uncertainty about diagnosis or therapeutic alternatives can encourage inappropriate continuation. At the pharmacy level, gaps in counselling or repeated supply can make treatment episodes effectively indefinite. At the organisational level, fragmented records, short consultations and weak recall systems undermine reassessment. At the policy level, variable enforcement of prescription rules and public access to misleading advertising complicate rational use. These layers connect both illustrative cases even though their specific clinical management remains

fundamentally different (Kurdi et al., 2024; Trimm et al., 2025; Van Ngoc et al., 2025).

2. Benefit-Risk Proportionality

A proportional approach to drug risk recognises that the magnitude of potential harm is relative to the burden of untreated disease. Severe inflammatory skin disease may justify a stronger topical preparation under supervision, whereas a mild or uncertain rash may warrant a different diagnosis or more cautious exposure. In epilepsy care, the consequence of destabilising a successful regimen may be substantial, and the harms of poorly executed withdrawal can outweigh those of monitored continuation. The ethical question is therefore whether a treatment remains proportionate to current need and whether the patient has a meaningful opportunity to participate in decisions. This framing aligns benefit-risk reasoning with clinical autonomy and safety (Sidbury et al., 2023; Brunner et al., 2025).

3. Layered Vulnerabilities

Drug risk is not only a property of molecular action. Biological vulnerabilities such as skin barrier disruption, older age, neuropsychiatric comorbidity or concurrent medicines interact with organisational conditions. A formulation applied to inflamed eyelid skin should not be approached as though it were applied briefly to thick palmar skin; likewise, a sedative prescribed to a frail older adult requires different attention from one used in a specialist-managed seizure disorder. Such examples illustrate effect modification and clinical heterogeneity. Without adequate stratification, broad statements about misuse can conceal the patients most likely to benefit from tailored intervention (Egeberg et al., 2024; McEvoy et al., 2025).

METHODOLOGY

This article employs a qualitative literature review rather than a systematic literature review or meta-analysis. Its purpose is interpretive synthesis of heterogeneous clinical and health-services literature into a coherent account of medication exposure, contextual determinants and preventable harm. The review considers publications dated 2020 to October 2026, prioritising peer-reviewed articles addressing topical corticosteroids, betamethasone, tinea incognito, corticosteroid adverse reactions, benzodiazepines, clonazepam, long-term prescribing, withdrawal, medication review and deprescribing. Studies specific to other topical corticosteroids or benzodiazepines are considered for class-level context and are not automatically treated as direct evidence for betamethasone or clonazepam individually (Nowowiejska, Baran and Flisiak, 2022; Brandt et al., 2024).

Literature identification was organised around combinations of drug names, therapeutic classes, safety outcomes and healthcare-process terms, including steroid misuse, fungal infection masking, atrophy, corticosteroid phobia, benzodiazepine dependence, tapering, falls, prescribing, counselling and shared decision-making. Journal records and available full-text sources were

examined to select contributions relevant to the seven research questions. Clinical guidelines, pragmatic trials, observational investigations, surveys, qualitative studies, and existing reviews provide different perspectives. Because this design does not aim at exhaustive retrieval, no PRISMA flow diagram, pooled effect estimate or claim of comprehensive ascertainment is offered. The methods should not be construed as systematic screening or formal risk-of-bias scoring (Sidbury et al., 2023; Brunner et al., 2025).

Analytical themes were developed through iterative comparison. First, the literature was grouped by therapeutic mechanism, exposure characteristics, adverse outcomes, patient behaviour and service delivery. Second, claims were examined for drug specificity and level of evidence; causal language was reserved for mechanisms or effects with adequate support, and associations were described as associations. Third, findings were compared across conditions to distinguish common system vulnerabilities from different biological pathways. Fourth, the resulting themes informed a proposed medication exposure-context-harm-stewardship framework. This interpretive process privileges transparency and clinical plausibility while acknowledging that qualitative synthesis involves author judgement and is susceptible to selection and publication bias (Brandt et al., 2024; Schindler et al., 2024).

RESULTS

The first cross-cutting finding is that legitimate efficacy and avoidable risk coexist. Topical corticosteroids remain important for many inflammatory dermatoses, and withholding them reflexively can permit avoidable disease activity. Appropriate treatment involves selecting the right potency and vehicle, specifying body sites and duration, and reassessing atypical or nonresponding lesions. Misuse is more likely when a prescription originally written for a defined episode becomes an unsupervised response to any new rash. The clinical challenge is therefore not to prohibit steroids but to maintain correspondence between diagnosis and exposure across repeated treatment episodes (Sidbury et al., 2023; Egeberg and Thyssen, 2024; Saeki et al., 2025).

In benzodiazepine treatment, context is equally important. Short-term symptom relief can create strong expectations of continued benefit, yet evidence for sustained effectiveness differs among indications, and complications may accumulate in certain populations. Primary-care studies describe persistent long-term prescribing, off-label indications and substantial variation across settings. These patterns cannot be reduced to individual prescriber negligence because they may also reflect shortages of psychological interventions, complex comorbidity and fragmented handovers. Nonetheless, continuation without clear goals, recorded indication or meaningful review should prompt reassessment rather than automatic renewal (Weleff et al., 2024; Peñarrubia-María et al., 2025; Trimm et al., 2025).

Corticosteroid Exposure and Fungal Disease

An especially instructive dermatological pattern is tinea incognito, a dermatophyte infection with altered morphology following inappropriate exposure to corticosteroids or other immunomodulatory treatment. Suppression of inflammation can diminish familiar borders, scaling or erythema, potentially creating diagnostic uncertainty while fungal disease persists. Case series and clinical reviews describe presentations mistaken for eczema or other inflammatory disorders, illustrating the importance of direct mycological assessment when lesions are unusual, recurrent or deteriorating during steroid treatment. This is primarily a problem of masking and modifying an existing infection, not evidence that betamethasone invariably produces an infection de novo (Nowowiejska, Baran and Flisiak, 2022; Zacharopoulou et al., 2024; Ghaderi et al., 2023).

Facial and other sensitive-site presentations highlight the difficulty of visually distinguishing steroid-modified infection from steroid-associated inflammatory change. Dermoscopic investigations provide additional descriptive clues, but they do not replace clinical assessment and suitable confirmatory tests when indicated. Earlier treatment history may be unreliable if patients regard a combination cream as a cosmetic product rather than a medicine or cannot identify its ingredients. Consequently, medication reconciliation should explicitly include topical preparations purchased without a prescription, shared within families or applied for skin lightening. Identifying prior exposure is not only an exercise in attribution; it directly shapes the differential diagnosis and appropriate next steps (Kwak et al., 2023; Ankad, Hurakadli and Chigurupati, 2024; Qeyam et al., 2025).

Broader Benzodiazepine Evidence

The clinical literature on benzodiazepines includes intervention syntheses, geriatric safety reviews and critical discussions of specific agents such as alprazolam. These contributions are useful for understanding class-level principles but should not be presented as direct clonazepam-specific trials. In older populations, risk estimates reflect concomitant conditions and selection into treatment, and in deprescribing studies the comparator and intensity of support strongly influence observed results. Researchers must preserve these distinctions rather than generalise uncritically across age groups or agents (Soni, Thiyagarajan and Reeve, 2023; Kozole Smid, Mlakar and Štukovnik, 2024; Cardona-Acosta et al., 2025).

Fears Across Patient Populations

Concern about topical steroid harms is not uniform across age groups or diagnoses. Research involving caregivers of children, adults with eczema and women with lichen sclerosus indicates that apprehension can coexist with chronic symptoms and can affect decisions about adherence. Instruments such as TOPICOP can organise assessment of these concerns, yet cultural context and access to medical advice shape their meaning. The implications extend beyond simple reassurance: clinician communication must identify the specific worry,

explain treatment benefits and harms accurately, and agree on a practical review plan (Nakahara et al., 2025; Borghi et al., 2025).

Economic Consequences and Messaging

Adverse treatment patterns can create costs for patients and health services through consultations, unnecessary products and additional testing. Evidence from comparative work on topical steroid misuse draws attention to financial as well as clinical consequences, although study setting and measurement choices limit generalisability. At the same time, large public surveys show that misinformation may produce both uncontrolled consumption and disproportionate fear. Patient education should distinguish everyday prescribed use from unsupervised cosmetic or prolonged use and should be evaluated for economic and patient-centred outcomes (Besra et al., 2024; Magboul et al., 2025; Promthes et al., 2025).

Other Dermatological Presentations

Published case descriptions expand the range of steroid-modified follicular disorders beyond classical dermatophyte presentations. For example, apparent improvement with a topical corticosteroid may conceal changes in Malassezia-associated folliculitis, while broader clinic-based studies report delayed recognition of diverse infection-related eruptions. The evidence is primarily descriptive, and it would be an error to infer a population risk estimate from individual reports. Nevertheless, such clinical observations reinforce the importance of eliciting precise topical exposure history and reconsidering diagnoses when an eruption changes unexpectedly (Cohen et al., 2020; Dhaher, 2020; Balasubramanian et al., 2023).

Corticosteroid-Associated Tissue Effects

The literature also describes local tissue changes associated with excessive or poorly targeted topical corticosteroid exposure. Cutaneous atrophy and vascular changes are plausible consequences of prolonged corticosteroid effects on dermal integrity, while acneiform lesions, periorificial reactions and altered wound appearance can complicate clinical presentation. Such outcomes depend on multiple factors, including potency, anatomical location and concurrent skin disease. Reports of broad adverse outcomes should not be interpreted as proving equivalent risk for every formulation or patient. Better communication would describe the actual treatment plan, reasons for choice and warning signs requiring reassessment (Egeberg et al., 2024; Makwana et al., 2022; DiRuggiero and DiRuggiero, 2025).

Withdrawal Controversies and Communication

Topical corticosteroid withdrawal has attracted considerable public attention, but the clinical construct is more contested than the well-established phenomenon of dermatophyte masking. Definitions, differential diagnoses and estimates of frequency remain insufficiently standardised. A deteriorating eruption after cessation can reflect returning disease activity, contact allergy, infection or a different pathological process; a single temporal association does

not settle causation. The literature supports taking patient experiences seriously while avoiding premature diagnostic certainty. Clinicians and researchers should describe exposure histories, clinical features and alternative diagnoses carefully, thereby reducing both dismissal and overdiagnosis (Hwang and Lio, 2022; Hamed et al., 2025).

Recent evidence-mapping research identifies gaps in the consistency and quantity of published data on topical steroid withdrawal syndrome, particularly where case definitions and alternative diagnoses are insufficiently established. A UK dermatologist survey further illustrates the divergence between clinical experience and established diagnostic consensus, while paediatric literature highlights the scarcity of systematically documented cases. Taken together, these sources support cautious interpretation, prospective study and empathetic patient communication rather than categorical assertions that withdrawal syndrome is either universal or nonexistent (Barlow, Proctor and Moss, 2024; Orr et al., 2024; Ahuja and Lio, 2025).

Benzodiazepine-Related Neuroadaptation

The second principal clinical theme concerns the consequences of sustained benzodiazepine exposure. Adaptations in inhibitory neurotransmission and related systems can underlie physiological dependence and withdrawal following reduction. Symptoms may involve anxiety, insomnia, autonomic disturbance and perceptual symptoms, with severe outcomes including seizures in susceptible circumstances. These risks explain why a general public-health message encouraging immediate cessation would be unsafe. A patient using clonazepam for a seizure disorder also requires specialist assessment of the original condition and potential recurrence. Contemporary guidance instead emphasises a patient-specific benefit-risk review, shared planning and avoidance of abrupt discontinuation where dependence is likely (Baldwin, 2022; Brunner et al., 2025).

Physical dependence and addiction must remain separate analytical categories. An individual may take the prescribed dose, experience no compulsive use, and still encounter distressing withdrawal when treatment is reduced. Conversely, escalating consumption, impaired control and drug-seeking behaviour may indicate an additional disorder requiring distinct assessment. Stigmatising all prolonged users as addicted discourages disclosure and can obscure why medication was continued. Qualitative accounts describe the importance of identity, therapeutic relationships and trust in prescribing decisions, supporting language that is clinically precise and respectful. Such conceptual clarity should be maintained in patient materials as well as professional guidance (Silvernail and Wright, 2022; Krüger et al., 2025; Brunner et al., 2025).

Sedation, Injuries and Interactions

Sedation and psychomotor effects introduce a separate set of benzodiazepine risks. Older adults, people with frailty and patients taking other sedating agents may be more vulnerable to falls, confusion and injury.

Concomitant opioid exposure is especially concerning because additive central nervous system depression can increase respiratory risk. These mechanisms warrant medication reconciliation and attention to changing health status, but observational findings do not justify attributing every fall or cognitive event to benzodiazepines. Severity, treatment duration, dose, illness and prescribing indication may confound comparisons between exposed and unexposed populations (Schindler et al., 2024; Wang et al., 2024; Hughes et al., 2026).

Evidence Heterogeneity

The published evidence contains important inconsistencies. Research comparing benzodiazepine exposure with dementia outcomes is particularly susceptible to reverse causality because anxiety, sleep disruption or behavioural symptoms can precede the formal recognition of cognitive decline. Different exposure definitions and follow-up periods further limit simple causal interpretation. Similarly, a retrospective study of fall outcomes after discontinuation cannot conclusively determine the intervention effect without considering selection and competing risks. A sound qualitative review should therefore report the presence of associations, articulate alternative explanations and prioritise stronger designs when making recommendations. Acknowledging heterogeneity increases the credibility of the clinical synthesis (Aldaz et al., 2021; Gerlach et al., 2022; Schindler et al., 2024).

Patient Perceptions and Self-Medication

A third cluster of findings concerns the formation of medication habits. In topical dermatology, easy availability, cosmetic motivations, repeat self-treatment and confusion about active ingredients can facilitate use without a current diagnosis. For clonazepam, continuation may arise through successive prescription renewals and understandable fear that untreated symptoms or withdrawal will be unmanageable. These are not identical behaviours: topical steroid overuse often involves repeated local application, whereas benzodiazepine continuation may be reinforced by physiological adaptation. Yet both demonstrate how limited counselling and inconsistent follow-up can transform a time-limited plan into habitual exposure (Qeyam et al., 2025; Alamri and Al Satti, 2024; Peñarrubia-María et al., 2025).

Pharmacist and Clinician Roles

Pharmacists are strategically positioned to clarify product identity, dosing, treatment duration and possible adverse effects. For topical therapy, counselling can focus on indication, site, amount and the need to revisit unexpected rashes. For benzodiazepines, pharmacists can help identify duplicate therapy, dangerous interactions, refill patterns and the need for prescribing review without independently imposing abrupt changes. Surveys of pharmacists reveal opportunities for improving topical steroid counselling, while primary-care studies highlight the need for coordinated benzodiazepine oversight. System design should facilitate, rather than merely exhort, these professional activities through shared medication records and workable referral channels (Kurdi et al., 2024; Nishimura et al., 2024; Van Ngoc et al., 2025).

Interventions and Outcomes

Evidence-informed intervention strategies differ by medicine. Appropriate corticosteroid management begins with diagnostic accuracy and selection of a suitable regimen, followed by review if symptoms persist or infection is suspected. For benzodiazepines, intervention may involve discussion of continued benefits, alternative therapy, co-medications and the patient's preference. Deprescribing trials, comparative reviews and multidisciplinary initiatives suggest that structured support can assist selected patients; however, reported effects depend on populations, clinical setting, intervention intensity and the outcomes measured. Success is not simply the number of prescriptions stopped but includes safety, symptom control, functioning and patient experience (Fung et al., 2024; Zeraatkar et al., 2025; Ferrer López et al., 2025).

A randomised clinical trial involving a masked taper combined with behavioural treatment for insomnia provides controlled evidence that how dose reduction is communicated and supported can matter for discontinuation outcomes. Its results apply to the populations and benzodiazepine-receptor agonists studied, rather than constituting a universal clonazepam tapering regimen. This distinction is important when translating trial evidence into individual clinical practice, particularly for patients with epilepsy or complex comorbidities (Fung et al., 2024; Brunner et al., 2025).

Individualised Treatment Change

Contemporary benzodiazepine tapering guidance provides an illustration of structured clinical judgement. It recommends regular risk-benefit reassessment, coordination with patients, appropriately paced adjustments and monitoring for withdrawal, with flexibility to modify the plan. The existence of a published dose-reduction framework does not imply that a generic schedule is suitable for all patients, especially those with seizure disorders, complex psychiatric comorbidity or unstable medical conditions. The central lesson for medication safety is procedural rather than numerical: treatment changes need informed consent, continuity, monitoring and capacity to respond to emerging symptoms (Brunner et al., 2025; Zgierska, Boyle and Conigliaro, 2025; McEvoy et al., 2025).

Measurement Challenges in Epidemiology

Measurement limitations also explain why reported rates of medication-associated harm differ among studies. Administrative prescribing records identify supply but often cannot determine actual ingestion, application technique or clinical intention. Surveys can measure perceptions yet are vulnerable to recall and social-desirability bias. Case reports document unusual patterns but provide no denominator from which population incidence can be calculated. In topical therapy, variability in strength and application site is frequently incompletely captured; in benzodiazepine research, treatment indications and withdrawal trajectories may be absent from electronic data. These limitations should be considered before ranking risk across medicines or geographical settings (Egeberg et al., 2024; Weleff et al., 2024; Trimm et al., 2025).

Patient-Defined Outcomes

Safety interventions can succeed by different definitions, and outcomes must match the purpose of care. A patient with recurrent eczema may value restored sleep and work capacity more than the lowest possible cumulative steroid exposure. A long-term benzodiazepine user may prioritise function, stability and an absence of disabling withdrawal over rapid discontinuation. For both groups, safety planning should incorporate clinical outcomes and patient-reported goals, rather than substitute a single exposure metric for treatment quality. Evidence on adherence concerns and supported tapering demonstrates the importance of engaging patients throughout a changing treatment journey (Kew et al., 2023; Fung et al., 2024; Krüger et al., 2025).

DISCUSSION

Population-level prescribing and injury studies provide essential context for interpreting individual cases. Observational work following stroke and longitudinal studies of prescription patterns illuminate settings in which patient vulnerability or clinical routines can change the balance of risk. National prescribing analyses also identify shifts over time that cannot be attributed to one clinical policy without more rigorous evaluation. The most appropriate use of such evidence is to guide targeted questions and surveillance priorities rather than claim uniform causality for all benzodiazepine users (Sun et al., 2025; Mattsson et al., 2025).

1. Comparing Two Pharmacological Pathways

The evidence indicates that the phrase medication misuse conceals diverse mechanisms. With a topical corticosteroid, harm may follow direct local exposure, insufficient diagnosis and the suppression of inflammatory signs that ordinarily prompt recognition of an infection. With clonazepam, adverse outcomes may reflect systemic central nervous system effects, interactions, changing functional vulnerability and neuroadaptation after repeated use. Accordingly, identical monitoring tools would be inappropriate: mycological reassessment and skin examination cannot substitute for withdrawal-risk assessment or neuropsychiatric review. A useful comparative framework must show where pathways diverge before identifying common points for prevention (Nowowiejska, Baran and Flisiak, 2022; Ankad, Hurakadli and Chigurupati, 2024; Brunner et al., 2025).

What connects the cases is the temporal dimension of prescribing. An appropriate decision at initiation is not permanently justified merely because it was appropriate once. Rashes evolve, differential diagnoses change, seizures may require re-evaluation and patients acquire additional illnesses or medications. This creates a need for dynamic benefit-risk assessment rather than binary categories of safe and unsafe drugs. The proposed concept of exposure-context fit describes whether current therapy still corresponds to a valid indication, acceptable cumulative risk, realistic monitoring and the patient's goals. In this interpretation, stewardship is the activity of maintaining or restoring that fit (Sidbury et al., 2023; Brandt et al., 2024; Brunner et al., 2025).

2. Distinguishing Prevention from Therapeutic Avoidance

A poorly designed safety campaign can generate harm through overtreatment and undertreatment. Dramatic photographs of steroid-related skin damage may deter some users from unnecessary cosmetic application, yet they may also frighten patients away from indicated eczema treatment. Similarly, messages about benzodiazepine dependence may prompt some people to discard tablets despite serious withdrawal or seizure risks. Risk communication should therefore be conditional, specifying which exposures are concerning, what monitoring is necessary and when professional review is indicated. This approach acknowledges real complications without converting a nuanced clinical decision into an alarming slogan (Kew et al., 2023; Albogami et al., 2023; Egeberg and Thyssen, 2024; Brunner et al., 2025).

3. Health Literacy as Relational Practice

Health literacy is frequently described as an individual capacity to understand instructions, but clinical communication also determines what information patients can reasonably use. A medication label may contain a dose without explaining the anatomical site, expected treatment interval or symptoms that warrant re-examination. A repeat clonazepam prescription may be technically correct while failing to clarify plans for review or alternatives. Effective counselling requires eliciting patients' existing explanations, using understandable language and verifying practical comprehension. This relational approach is more likely to distinguish deliberate non-adherence from misunderstanding, financial barriers and uncertainty about the original diagnosis (Tangthanapalakul et al., 2023; Kew et al., 2023; Weleff et al., 2024).

4. The Role of Diagnostics

Accurate diagnosis is particularly important in the dermatological pathway. The temptation to interpret every red or itchy lesion as inflammation can lead to repeated symptomatic steroid use and delay identification of dermatophyte disease. Treatment response alone is not a reliable diagnostic test because inflammation may diminish even when an infectious process remains. Where clinical features are atypical, direct examination, microscopy or other suitable diagnostic approaches may be necessary. The generalisable lesson is that symptom suppression and disease resolution are not synonymous, although the precise diagnostic tools differ by therapeutic field (Nowowiejska, Baran and Flisiak, 2022; Kwak et al., 2023; Zacharopoulou et al., 2024).

5. Continuity of care

Continuity of care is the corresponding cornerstone for prolonged benzodiazepine treatment. Where care moves between primary physicians, specialists and emergency settings, the reasons for initiation and earlier treatment decisions can become difficult to reconstruct. Automated renewals may preserve a regimen while allowing the underlying therapeutic question to disappear. Longitudinal review should document the current indication, patient-reported benefit, functional effects, competing treatments, interaction risks and preference

about future care. Programmes that focus exclusively on reducing prescription counts can underestimate the importance of withdrawal safety and therapeutic relationships (Peñarrubia-María et al., 2025; Ferrer López et al., 2025; Krüger et al., 2025).

6. Integrating Patient Safety and Justice

The social distribution of medicine-related harm also matters. Rural residents, low-income patients and people with limited access to specialist care may face different pathways to inappropriate exposure. Some purchase topical products through informal channels; others depend on repeated sedative prescriptions because behavioural therapies are inaccessible. Yet broad restrictions imposed without adequate alternatives may displace rather than resolve risks. Equity-oriented policies should pair rational regulation with clinician training, affordable assessment, patient education and accessible treatment options. The relevant policy outcome is safer care, not simply reduced sales of selected drugs (Van Ngoc et al., 2025; Roncero et al., 2025; Qeyam et al., 2025).

7. The Proposed Integrative Framework

Figure 1 presents the review's overarching conceptual model. The first layer concerns therapeutic exposure, including drug selection, dosage, anatomical site where relevant, treatment duration and clinical indication. A second layer contains drug-specific pathways of harm: local skin changes or altered infectious presentation for corticosteroids, and systemic sedation or neuroadaptation for benzodiazepines. A third layer identifies factors capable of amplifying or moderating risk, including literacy, access, co-medication, social conditions and continuity of care. The final layer consists of prevention processes, including diagnosis, counselling, regular review and safe treatment change (Brandt et al., 2024; Brunner et al., 2025).



Figure 1. Author-Developed Conceptual Framework Relating Exposure, Context, Potential Harm, and Stewardship

The framework does not claim that every patient progresses linearly toward harm. In fact, intervention at one stage can disrupt the sequence: an appropriate fungal diagnosis may prevent repeated corticosteroid application, while a careful benzodiazepine review may identify a compelling reason for

continued specialist-supervised treatment. Exposure-context fit can improve through modifying a regimen, treating an underlying disease, introducing an alternative intervention or reinforcing existing appropriate therapy. The model is intended to guide questions for care teams and researchers, not replace clinical judgement or quantify an individual patient's probability of complications (Sidbury et al., 2023; Nowowiejska, Baran and Flisiak, 2022; Brunner et al., 2025).

5.8 Dermatological pathway figure

Figure 2 details the dermatological pathway. The diagram distinguishes inappropriate corticosteroid exposure, local immunomodulation, changes in lesion appearance and downstream diagnostic or tissue consequences. Its arrows represent plausible conceptual connections rather than incidence estimates. A steroid-modified fungal rash is depicted as a separate outcome from skin atrophy, because the former requires underlying fungal disease while the latter relates principally to tissue effects of exposure. The figure should help readers recognise why the label infection risk is too imprecise without an explanation of the starting diagnosis and the mechanism by which treatment complicates infection recognition (Nowowiejska, Baran and Flisiak, 2022; Egeberg et al., 2024).

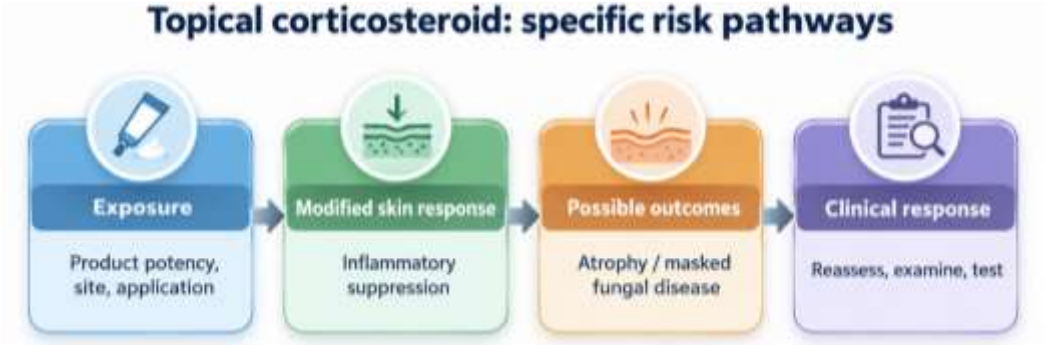

Figure 2. Conceptual Mechanisms of Dermatological Complications Following Inappropriate Topical Corticosteroid Exposure

9. Neurological Pathway Figure

Figure 3 contrasts therapeutic benzodiazepine exposure with two partially distinct outcome streams: direct sedative effects and neuroadaptation-associated dependence or withdrawal risk. It also explicitly separates physiological dependence from a substance use disorder. This distinction matters for stigma, diagnosis and safe management. The figure highlights additional modifiers such as age, competing conditions and opioid co-exposure rather than implying that clonazepam inevitably produces addiction or that withdrawal occurs uniformly. Its conceptual boundaries follow modern guidance calling for individualised assessment rather than automatic discontinuation (Baldwin, 2022; Brandt et al., 2024; Brunner et al., 2025).



Figure 3. Conceptual Distinction Between Benzodiazepine Sedative Effects and Neuroadaptation-Related Dependence

10. Implementation Figure

Figure 4 translates the synthesis into a clinical and organisational cycle: verify indication, classify exposure risk, discuss benefits and concerns, monitor meaningful outcomes, reconsider treatment and document follow-up. Pharmacists, clinicians and patients contribute at different stages, with attention to service capacity and equitable access. This model can support quality-improvement discussions, but the present review does not establish its effectiveness in prospective trials. Future evaluation should include not only prescription duration and adverse-event counts but also symptom control, patient-reported wellbeing, therapeutic alliance and unintended harms caused by intervention (Fung et al., 2024; Ferrer López et al., 2025; Van Ngoc et al., 2025).



Figure 4. Proposed Patient-Centred Medication Stewardship Cycle

11. Research implications and limitations

The comparative approach reveals several gaps. Betamethasone-specific risk estimates may be obscured by broad class-level categories, heterogeneous formulations and poor exposure measurement. Benzodiazepine studies likewise combine distinct agents, indications and populations, limiting direct inference about clonazepam. Cross-sectional surveys measure attitudes and reported behaviours but rarely establish direction of causation. Evidence on cosmetic steroid misuse may not transfer directly across regulatory environments, while discontinuation outcomes depend on treatment context. Better longitudinal data, clearer diagnostic definitions and stronger intervention evaluations would

improve clinical interpretation (Ankad, Hurakadli and Chigurupati, 2024; Schindler et al., 2024; McEvoy et al., 2025).

Future studies could compare medication-safety interventions across unrelated drug classes while retaining outcome measures appropriate to each medicine. For topical corticosteroids, priorities include verified exposure histories, diagnostic delay, dermatoscopic or microbiological confirmation and safe disease control. For clonazepam, priorities include functional outcomes, withdrawal trajectories, patient-defined goals and the effect of supported review programmes on safety. Mixed-method and implementation studies could explore how clinicians act on alerts, which counselling strategies change understanding, and whether supportive deprescribing services reduce inequities. Such work would provide empirical tests of the proposed framework instead of treating conceptual agreement as demonstrated effectiveness (Fung et al., 2024; Trimm et al., 2025; Van Ngoc et al., 2025).

12. Clinical Recommendations

The review supports a proportionate approach to clinical action. Dermatological services should make medication history and disease reassessment routine when treatment fails or morphology is unusual, while ensuring that patients with established inflammatory conditions receive adequate therapy rather than fear-driven undertreatment. Neuropsychiatric services should distinguish appropriate continuation from unreviewed maintenance and discuss tapering only in the context of individual benefit-risk assessment. Across both settings, accessible instructions, medication reconciliation, pharmacy communication and documented follow-up create opportunities for harm prevention. None of these recommendations should be interpreted as patient-specific instructions to stop or modify a prescribed medicine without professional oversight (Sidbury et al., 2023; Brandt et al., 2024; Brunner et al., 2025).

13. Digital Medication Governance

Digital prescribing and dispensing systems could strengthen stewardship if designed around usable clinical decisions. Alerts can flag duplicate sedatives, high-risk combinations or unusual refill patterns; structured dermatological records can capture previous topical agents and treatment sites. Yet alert fatigue, incomplete pharmacy histories and false assumptions about actual medicine use limit automated solutions. Digitisation is not a substitute for conversation and examination. Research should test whether decision support changes meaningful outcomes, protects privacy and reduces disparities instead of merely generating more warnings for busy clinicians (Kurdi et al., 2024; Weleff et al., 2024; Van Ngoc et al., 2025).

14. Balanced Regulation

Regulation provides another opportunity and risk. Restrictions may reduce inappropriate access but can also disrupt legitimate patients when substitute care or specialist advice is unavailable. For topical corticosteroids,

enforcement should be accompanied by accessible diagnostic services and evidence-based patient education. For benzodiazepines, prescribing oversight should protect people from unmanaged interactions and unsafe indefinite continuation while avoiding coercive or abrupt discontinuation. These objectives require coordination between professional societies, pharmacy networks, policymakers and patient representatives. A carefully evaluated stewardship programme is more likely to achieve sustainable safety improvements than a strategy based solely on medicine volume reduction (Brandt et al., 2024; Brunner et al., 2025; Van Ngoc et al., 2025).

15. Implications for Training

Interprofessional education should cultivate the ability to recognise both under- and over-treatment. Dermatology training can use cases of steroid-modified fungal disease to demonstrate the danger of relying on symptom suppression as diagnostic confirmation. Primary-care and pharmacy education can use clonazepam cases to distinguish dependence from substance use disorder and to practise non-stigmatising discussions about risk review. Simulation, case discussion and shared protocols may support consistent practice, but their outcomes need evaluation rather than assumption. Successful training should be assessed through decision quality and patient outcomes, not simply self-reported confidence (Nowowiejska, Baran and Flisiak, 2022; Brandt et al., 2024; Brunner et al., 2025).

16. Limits of Comparison

The strengths of the cross-class comparison should not obscure its limitations. Topical glucocorticoids and benzodiazepines have markedly different tissue distribution, primary indications, adverse-effect mechanisms and termination risks. Their legal status and supply channels also differ. Thus, the conceptual framework can identify shared process failures but cannot supply a universal numeric risk score, a common treatment-duration threshold or an interchangeable deprescribing protocol. Any application of the model must incorporate drug-specific guidance and specialist judgement. This boundary is especially important when public communication reduces complex clinical issues to a juxtaposition of photographs and simplified labels (Sidbury et al., 2023; Brunner et al., 2025).

CONCLUSIONS AND RECOMMENDATIONS

Topical betamethasone and clonazepam illustrate different biological and clinical pathways through which useful treatments may become associated with avoidable harm. Inappropriate topical corticosteroid use can complicate diagnosis, modify fungal disease presentation and produce local tissue effects, whereas prolonged benzodiazepine exposure may contribute to sedation, physiological dependence and difficult withdrawal. Their shared lesson is not that all long-term or potent medication is unacceptable, but that appropriate therapy requires continuing correspondence between current indication, exposure, monitoring and patient circumstances. Medication safety is best understood as an ongoing process rather than a one-time prescribing decision.

The proposed exposure-context-harm-stewardship framework connects drug-specific mechanisms with modifiable determinants such as health literacy, diagnostic uncertainty, medication access and continuity of care. Practical priorities include accurate assessment, transparent counselling, shared decisions, regular review and safe treatment adjustment when indicated. Policies should support professional judgement and access to appropriate alternatives rather than encourage indiscriminate restrictions or sudden withdrawal. Future research should test integrated approaches in diverse health systems using patient-centred outcomes and designs capable of distinguishing association from causation. Ultimately, minimising therapeutic harm requires protecting appropriate treatment while reducing preventable departures from safe practice.

FURTHER STUDY

This research still has limitations, so further studies on the topic 'When Treatment Becomes Harm: Topical Corticosteroid Misuse, Long-Term Benzodiazepine Dependence, and the Challenges of Medication Safety—A Review' are needed to improve this research and provide more insights for both the authors and the readers.

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