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pharmacy PRACTICE + BUSINESS

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A Primer on Dermatology

by Robin Andrade, R.Ph.T

Learning objectives

After completing this lesson, the pharmacy technician participant will be able to:

1. Review four dermatological conditions (acne, eczema, psoriasis, rosacea) and their available treatments.
2. Discuss the importance of adherence to medication therapy.
3. Review potential concerns with these conditions being left untreated.
4. Understand how a registered pharmacy technician can assist patients in managing these conditions.

Introduction

Skin conditions such as acne, eczema, psoriasis and rosacea can have a significant impact on a patient's quality of life. Not only can these conditions be physically uncomfortable, but they can also affect social lives, cause embarrassment, and potentially, isolation. With ongoing support from the pharmacy team, these conditions can be successfully managed by the patient, providing a better sense of overall wellbeing.

Acne

Acne vulgaris is an inflammatory disease which can be caused by multiple factors. It is the most common skin condition seen by der-

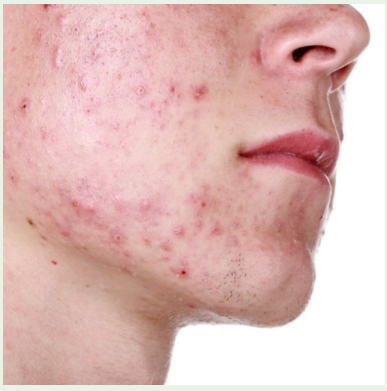
TABLE 1 - Types of Acne[1,3]

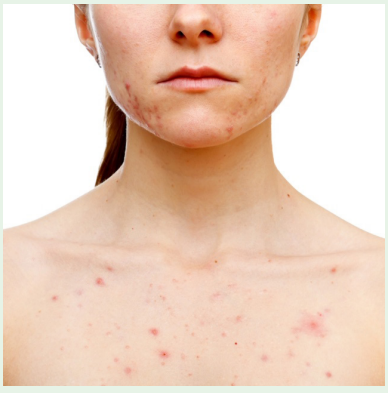
Type	Characteristics
Mild	A few small lesions that are close to skin surface; may be inflamed. Some papules and pustules.
Moderate	Somewhat larger and more extensive number of whiteheads/blackheads and inflamed spots with redness. Several papules and pustules.
Severe	Involves many more acne spots, some deeper lumps called nodules and cysts, redness and scarring. Numerous papules and pustules.

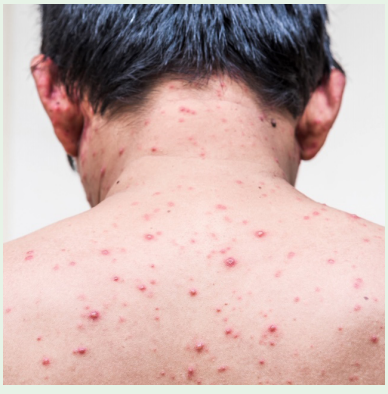
TABLE 2 - Pharmacological Treatments for Acne According to Severity[3]

Acne Severity	Examples of Initial Therapies Used
Mild acne	• Topical benzoyl peroxide 2.5%–10% • Topical retinoids (tretinoin, tazarotene, adapalene) • Topical combination therapy: - Benzoyl peroxide + topical retinoid OR topical antibiotic (clindamycin, erythromycin) - Topical retinoid + topical antibiotic
Moderate acne	• Topical therapy (see mild acne, excluding topical antibiotics) + oral antibiotics (erythromycin, doxycycline, minocycline, others) • For females: topical therapy + combined oral contraceptives (ethinyl estradiol/cyproterone, ethinyl estradiol/drospirenone, ethinyl estradiol/levonorgestrel, others) OR spironolactone
Severe acne	• Oral isotretinoin • Topical therapy (see mild acne, excluding topical antibiotics) + oral antibiotics • For females: topical therapy + combined oral contraceptives OR spironolactone

Images of Acne
Acne can affect, but is not limited to, the face, back, shoulders and neck.
(https://dermatology.ca/public-patients/skin/acne/)







matologists,[1] with a prevalence of 85% among those aged 12 to 24 years.[2] Characteristics of acne include:[2]

- Comedones, which may be open (blackhead) or closed (whitehead)
- Papules small, tender, raised, solid pimple
- Pustules (pimple containing pus)
- Redness
- Swelling
- Scarring

Acne can affect, but is not limited to, the face, back, shoulders and neck.

Causes of Acne

Acne may be caused by a bacterium called Cutibacterium acnes (C. acnes), which produces pore blockage and inflammation[1], as well as increased sebum (an oily substance) production by sebaceous (oil) glands. When pores become clogged with sebum and dead skin cells, acne results. Hormones, genetics, food allergies, stress and the use of cosmetics may also contribute to the development of acne. Acne is classified from mild to severe according to number of acne lesions, including comedones, papules and pustules.[3]

Treatment

Control of acne requires ongoing care. Treatment is pharmacologically based, and focuses on prevention of new lesions, as well as clearing current acne. It is important to let the patient know that sometimes improvement can take two to three months,[3] and some acne medications can initially cause dryness, peeling, flaking, redness, irritation and/or possibly acne flare-ups. In other words, acne can appear worse before getting better. These effects can lead some patients to stop treatment early. Left untreated, physical scarring on the face and body can occur, potentially causing a lifetime of negative psychological effects for the patient.

Non-Prescription Acne Treatment

There are various medicated soaps and non-prescription washes to assist with mild acne. Products containing active ingredients such as salicylic acid, sulfur and benzoyl peroxide (alone or in combination) are available for patient self-care use. Although research on the effectiveness of medicated cleansers is limited, one study found these to be effective in reducing inflammatory and non-inflammatory lesions.[4]

When medicated soaps are not appropriate or desired, patients should wash no more than twice daily with a mild soap or soapless cleanser.[5] Patients with acne may wash too frequently, attempting to remove surface oils; however, there is no

TABLE 4 - Pharmacological Treatments for Eczema[6, 7]

Class/ Dosage form	Examples	Comments
Moisturizers	• Petrolatum (occlusive moisturizer) • Ceramides/cholesterol/ free fatty acids (barrier repair product)	First-line therapy for mild eczema and an important part of treatment for moderate and severe eczema. Frequent use helps seal in moisture. Shown to prolong time to flare and reduce number of flares.[7] Patients with eczema require ongoing moisturizer therapy.
Corticosteroids (topical), various potencies	• Hydrocortisone, triamcinolone acetonide, beclomethasone dipropionate	Also considered first-line for management of eczema
Antibiotic/ corticosteroid (topical) combinations	• Gentamicin / betamethasone valerate • Fusidic acid/ hydrocortisone	Reserved for eczema that is secondarily infected
Calcineurin inhibitors (topical)	• Pimecrolimus • Tacrolimus	
Biologic therapy (subcutaneous injection)	• Dupilumab	For patients who have not responded to topical treatment or those who are unable to tolerate topical therapy.

evidence to suggest this improves acne.[23]

To prevent acne caused by cosmetic products, patients should be advised to discontinue oil-containing cosmetics, moisturizers and sunscreens and to avoid cosmetic programs that advocate applying multiple layers of cream-based cleansers and cover-ups.[23]

Eczema

Eczema, or atopic dermatitis (AD), is a common inflammatory skin condition that affects up to 17% of Canadians at some point in their lives.[5] This condition is characterized by a dry, scaly rash with inflamed skin that is very itchy or sometimes painful.[5] Eczema tends to appear in early childhood, with patches of erythema (redness), inflammation and dryness.[5] While eczema may regress as children grow, years of uncomfortable pruritus (itching) can cause stress on the patient. The extent of eczema can vary from limited to covering most of the body, with the latter being considered severe or complicated eczema. The location of eczema also varies, generally with age, but is most commonly found on the face, elbows and knees of babies, and behind the knees, inside the elbows, on the sides of the neck, and on the wrists, ankles and hands of older children.[5]

Causes of Eczema

Eczema is often hereditary,[5] and patients can be affected at any age, although it is predominantly a disease of childhood.[7] Several factors can aggravate eczema or cause disease flares, including stress, environmental allergens, climate, and dietary influences.[7] Eczema in adults may be associated with other serious chronic conditions that contribute to poor health including diabetes, obesity, autoimmune disease, high blood pressure and heart disease. Risk for these conditions increases with eczema severity.[9]

Treatment

Failure to follow treatment recommendations is the most significant barrier to successful management of eczema, with only about 24% of patients properly following treatment recommendations.[5] Eczema is a chronic condition with no known cure. Treating symptoms, such as pruritus and dry skin, is key to patient comfort. If left untreated, eczema may become extremely uncomfortable or secondarily infected.[6]

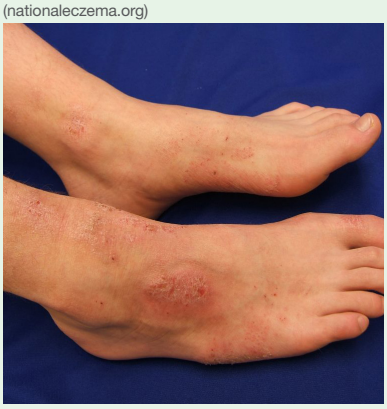
Nonpharmacologic therapy

Many nonpharmacological treatments are available for eczema. Effectiveness may vary depending on severity of symptoms.

- Bathing may be useful in rehydrating the skin and removing irritants and allergens. Water should be warm, and the bath brief, limited to five to 10 minutes once daily. Skin should be patted dry and moisturizer should be applied within three minutes to minimize the potential drying effects of bathing.[10]
- The Canadian Dermatological Association and National Eczema Association suggest that soaking in

Images of Eczema

(nationaleczema.org)



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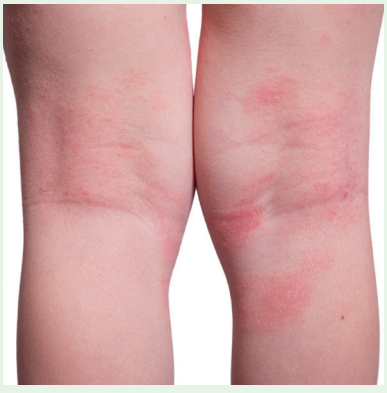

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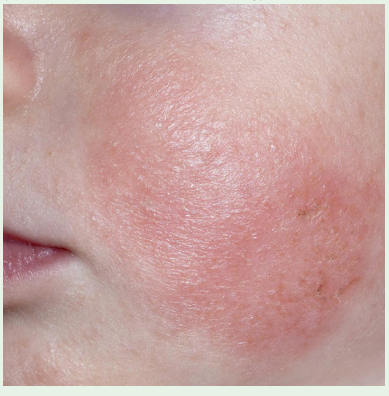


bleach baths (a full tub of lukewarm water with a half-cup of household bleach added) for five to 10 minutes twice weekly may be effective in those susceptible to frequent infections,[8] which can worsen eczema.[9] However, there is conflicting evidence regarding the effectiveness of bleach baths vs. water baths.[24] Patients should determine what works best for their eczema.

- Cool compresses relieve inflammation and itching.[5]
- Phototherapy. In those with severe eczema who have failed on topical therapy, regular exposure to specific rays of ultraviolet light may be effective in reducing symptoms.[5,11] This treatment should only be done under the supervision of a dermatologist.

Psoriasis

Psoriasis is a chronic, inflammatory, skin condition, which affects approximately one million Canadians.[12] It often appears between the ages of 15-25 and both men and women are equally susceptible.[13] There are five types of psoriasis–the two most common are reviewed in Table 5. Psoriasis can have a significant impact on a patient's quality of life, as multiple body areas can be affected, from the soles of their feet to their face and scalp. Psoriatic arthritis is a form of chronic arthritis that may affect up to one-third of patients with psoriasis, further impairing quality of life.[13]

Causes of Psoriasis

The exact cause of psoriasis has not been determined, but researchers believe it involves a combination of environmental and immune factors, and genetics.[12] One-third of sufferers have at least one family member with the condition.[12] Psoriasis develops when there is a malfunctioning of the immune system which causes inflammation. White blood cells (T cells) in the immune system are triggered, causing inflammation, which leads to skin cell shedding at 10 times the normal rate.[12]

Common Comorbidities

Patients with psoriasis may be at an increased risk of developing other chronic and serious health conditions. Left undiagnosed and untreated, these conditions can have negative implications for health and wellbeing. As such, patients with psoriasis should be regularly screened for potential comorbidities, including:[14]

- Cancer
- Cardiovascular disease
- Crohn's disease
- Depression
- Diabetes
- Obesity
- Osteoporosis
- Uveitis (inflammatory disease of the eye)
- Liver disease

TABLE 5 - Most Common Types of Psoriasis[13]

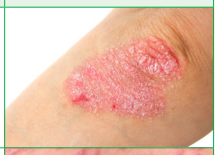
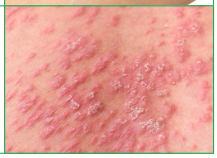
Type	Characteristics	Images
Plaque (most common)	Appears as raised, red patches covered with a silvery white buildup of dead skin cells.	
Guttate (second most common)	Appears as small, dot-like lesions. Guttate psoriasis often starts in childhood or young adulthood, and can be triggered by a strep infection.	

TABLE 6 - Pharmacological Treatments for Psoriasis According to Severity[16]

Psoriasis Type	Treatment Examples
Mild to moderate psoriasis	• Topical therapy*, such as: - Corticosteroids (hydrocortisone, betamethasone) - Coal tar - Anthralin - Vitamin D derivatives (calcipotriol, calcitriol) - Tazarotene - Salicylic acid *Topical therapies may be used alone or in combination. Choice is often dependent on body site involved
Moderate psoriasis	• Topical therapy + UV phototherapy
Chronic moderate to severe psoriasis	• Intravenous or subcutaneous biologic response modifiers (adalimumab, brodalumab, etanercept, guselkumab) • Oral immunosuppressives (methotrexate, apremilast) • Oral acitretin

Triggers

Scientists believe that at least 10% of people inherit one or more genes that could lead to psoriasis. However, only 2%–3%[15] of the population actually develops the disease. This may be because patients must not only have the genes that cause psoriasis, but also be exposed to certain triggers. These triggers may also be responsible for disease flare-ups. Potential triggers include:[15]

- Dry winter weather that causes the skin to become irritated and itchy.
- Stress (note: decreasing potential stressors can improve a patient's quality of life. Keeping a diary of stressors can assist the patient in identifying triggers).
- Obesity or smoking cigarettes can increase psoriasis complications.
- Infections such as strep throat or bronchitis.
- Certain medications such as lithium, indomethacin, propranolol, quinidine, and antimalarials.[12]
- Skin injury (known as the Koebner phenomenon; psoriatic lesions form in uninvolved skin after cutaneous trauma).[22]

Treatment

To date, there is no known cure for psoriasis. Current focus is on management of symptoms and reducing the risk of comorbidities. Poor long-term adherence is a common issue in psoriasis management and may be attributed to complicated

treatment regimens, inconvenience, and the use of medications that are malodorous or cause staining.[16] Common treatments for psoriasis include topical and systemic therapies (Table 6). Ultraviolet (UV) phototherapy is also an option for management when topical therapies alone have failed.[17]

Rosacea

Often mistaken for adult acne, rosacea is a chronic and progressive vascular skin disorder that affects over three million Canadians.[18] It is the fifth most common diagnosis made by dermatologists and patients usually present between the ages of 20-40.[19] Signs and symptoms commonly reported with rosacea include facial redness, burning, swelling, skin thickening and stinging. These symptoms affect overall self-esteem and confidence, and may cause patients to avoid social situations. Eye symptoms, such as irritation, dryness and conjunctivitis, can also occur, with 50% of patients being affected.[20] If left untreated, inflammatory bumps and pimples often develop, and in severe cases—particularly in men—the nose may become swollen and bumpy from excess tissue.[20]

Causes of Rosacea

The exact cause of rosacea is unknown, but genetic and environmental factors are likely involved. Recent studies have shown that the facial redness is likely to be the start of an inflammatory continuum initiated by neurovascular dysregulation and the innate immune system. A microscopic mite called Demodex folliculorum has also been implicated. This mite is a normal inhabitant of human skin, but is substantially more abundant in the facial skin of rosacea patients.[20] Four types of rosacea have been defined by the National Rosacea Society; please refer to Table 7.

Treatment

Untreated rosacea can worsen over time, so it is important that patients see a physician as soon as possible. Treatment adherence is critical, as discontinuation of therapy can result in the resurgence of rosacea symptoms.[21] Engaging in regular conversations with patients to ensure they understand this may facilitate adherence. Treatment includes both nonpharmacologic strategies (below) and pharmacologic therapy (Table 8).

TABLE 7 - Types of Rosacea[18]

Type	Characteristics
Erythematotelangiectatic	Rosacea sufferers often experience flushing and persistent facial redness. Small blood vessels may also become visible in some patients, and stinging, burning, swelling and roughness or scaling may occur.
Papulopustular	In addition to persistent redness, bumps (papules) and/or pimples (pustules) are common in many rosacea sufferers. Some patients may also experience raised red patches known as plaques.
Phymatous	In some individuals, rosacea may affect oil glands and connective tissue causing skin tissue to thicken (appearing enlarged) and become bumpy. Phymatous rosacea most commonly affects the nose.
Ocular	In addition to skin symptoms, rosacea may affect the eyes and eyelids. It can cause redness in skin tissue surrounding the eyes, ocular burning or stinging, dryness, light sensitivity, blurred vision and watery, bloodshot eyes.

TABLE 8 - Pharmacological Treatments for Rosacea[19]

Rosacea Type	Medication Examples
Erythematotelangiectatic	• Topical therapies (brimonidine)
Papulopustular	• Topical therapies (metronidazole, azelaic acid, ivermectin) • Oral antibiotic therapy (doxycycline, tetracycline) • Low-dose isotretinoin
Phymatous	• Oral therapy (low-dose isotretinoin) • Oral antibiotic therapy (doxycycline, tetracycline) • Topical retinoids
Ocular	• Topical therapies (cyclosporine eye drops, artificial tears) • Oral antibiotic therapy (doxycycline, tetracycline)

Nonpharmacologic treatments

- Educate patients on rosacea triggers and lifestyle factors, such as sun exposure, stress and alcohol, which can worsen the condition.
- Encourage regular use of a broad-spectrum, high SPF (30 or above) sunscreen to help prevent rosacea flare-ups.
- Provide skincare tips, such as avoiding products with astringents or fragrances, which might cause further irritation.
- Avoid certain foods that may cause flushing, such as hot drinks and spicy foods.
- Use green-tinted foundation to reduce redness.
- Undergo treatment with vascular lasering systems or broadband intense light for management of certain phenotypes.
- Use eyelid hygiene measures (e.g., gently washing eyelids BID with warm water and diluted baby shampoo) if there is ocular involvement.

Role of the Pharmacy Technician in Dermatological Care

Pharmacy technicians (RPhTs) can play a pivotal role in the circle of care for patients with dermatological conditions. If the patient is new to the pharmacy, gathering lifestyle information (e.g., smoking status, diet, exercise) and a best possible medication history (BPMH) can assist in identifying potential disease triggers. For example, in the case of psoriasis, if it is identified that the patient smokes cigarettes, a discussion on smoking cessation could follow, where the RPhT explains how the pharmacist can assist in quitting and how quitting may reduce disease severity. Since obesity is

also linked to psoriasis severity, a RPhT could gather information related to diet and exercise to assist the pharmacist in counselling the patient.

Discussing insurance coverage with the patient may also be critical, as some treatments can be costly. If a patient is struggling to afford their medications, adherence can be negatively affected. Using less medication and/or using the medication less frequently than prescribed (e.g., applying a topical product once daily instead of twice daily) to make it last longer may reduce product efficacy. Such non-adherence, or discontinuation of treatment, can potentially be avoided if RPhTs monitor patients' refills, and continue conversations regarding the importance of adherence for successful disease management. If cost becomes an issue, the RPhT could ask the pharmacist to intervene and potentially recommend a cheaper alternative for the patient.

RPhTs can ensure moisturizers are always in stock and readily available to newly diagnosed patients and those continuing treatment. Inventory issues can disrupt skincare regimens, potentially causing a disease flare-up.

RPhTs can also help organize in-house patient education sessions. These sessions would allow patients to interact with other individuals with similar dermatological conditions, reinforce appropriate medication administration and the importance of adherence, and provide an opportunity for patients to ask questions. Inviting different practitioners (dermatologist, dietician, nurse practitioner) to speak can assist patients in identifying important care providers who can help them manage their condition, and understand how different professions work together to provide comprehensive and quality care.

At each refill, RPhTs can play an important role in identifying patients that might need referral to the pharmacist. Asking open-ended questions, such as "what questions or concerns do you have about this medication?" and "how do you take/use this medication?" can reveal adverse effects or medication administration difficulties that can be addressed by the pharmacist.

By understanding common dermatological conditions and their treatments, RPhTs can help facilitate the successful management of these conditions, improving health outcomes and quality of life for patients.

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QUESTIONS

Please select the best answer for each question and answer online at eCortex.ca for instant results.

1. Which type of rosacea commonly affects the nose?
a) Ocular
b) Papulopustular
c) Phymatous
d) Erythematotelangiectatic

2. Which of the following skin conditions is most commonly seen by dermatologists?
a) Psoriasis b) Rosacea
c) Acne d) Eczema

3. How many Canadians are affected by psoriasis?
a) 5 million b) 1 million
c) 20% d) 5%

4. Which of the following is a known cause of eczema?
a) Genetics
b) Contact with an environmental irritant
c) Stress
d) All of the above

5. Which condition commonly begins in early childhood?
a) Rosacea
b) Acne
c) Psoriasis
d) Eczema

6. How can a pharmacy technician assist a patient with a dermatological condition?
a) Demonstrate how to apply topical medication

b) Take a best possible medication history
c) Change a topical medication from a cream to an ointment
d) Communicate with the prescriber about the best treatment care plan for the patient.

7. What is another name for eczema?
a) atypical dermatitis
b) atopy dermatitis
c) allergic dermatitis
d) atopic dermatitis

8. Which of the following is recommended to prevent rosacea flare-ups?
a) Using a sunscreen with an SPF of 30 or higher
b) Using a sunscreen with an SPF of 60 or higher
c) Using astringents
d) Using corticosteroids

9. In patients with eczema, bathing should be limited to which of the following durations?
a) 1–2 minutes
b) 20 minutes
c) 5–10 minutes
d) 30 minutes

10. Biologic response modifiers are used for treatment of which condition?
a) Acne
b) Rosacea and psoriasis
c) Psoriasis and eczema
d) Eczema

11. In this article, scarring was discussed as a potential outcome for which of the following conditions?
a) Acne
b) Rosacea
c) Psoriasis
d) Eczema

12. Which is not a comorbidity commonly seen with psoriasis?
a) Depression
b) Obesity
c) Kidney disease
d) Liver disease

13. How long may it take for improvement to be seen with acne treatment?
a) 3–6 months
b) Immediately after starting treatment
c) 2–3 months
d) 6 months or longer

14. Which of the following conditions can be treated with phototherapy?
a) Acne and psoriasis
b) Psoriasis and eczema
c) Rosacea and acne
d) Eczema and acne

15. Which of the following conditions can be treated with isotretinoin?
a) Psoriasis and acne
b) Rosacea and eczema
c) Eczema and psoriasis
d) Acne and rosacea

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A Primer on Dermatology

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1. a b c d	**4.** a b c d	**7.** a b c d	**10.** a b c d	**13.** a b c d
2. a b c d	**5.** a b c d	**8.** a b c d	**11.** a b c d	**14.** a b c d
3. a b c d	**6.** a b c d	**9.** a b c d	**12.** a b c d	**15.** a b c d

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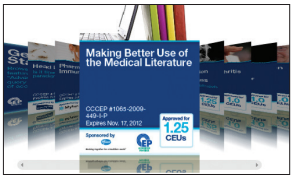

For information about CE marking, please email canadianhealthcarenetwork@halldata.com.
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