Red scaly rash: the papulosquamous eruption

Basic Dermatology Curriculum

Last updated January 2015
The following module contains a number of blue, underlined terms which are hyperlinked to the dermatology glossary, an illustrated interactive guide to clinical dermatology and dermatopathology.

We encourage the learner to read all the hyperlinked information.
Goals and Objectives

- The purpose of this module is to help medical students develop a clinical approach to the evaluation and initial management of patients presenting with red scaling patches or plaques on the body.

- After completing this module, the learner will be able to:
  - Recognize the importance of KOH exam for red, round scaling rashes on the body
  - Identify differentiating features of common papulosquamous eruptions
  - Determine when to refer to a patient with a red scaly rash to a dermatologist
Papulosquamous eruption: differential diagnosis

Common causes:
- Tinea corporis
- Pityriasis rosea
- Secondary syphilis
- Psoriasis
- Nummular eczema
- and others

Patients that are systemically ill and/or eruptions that are rapidly progressing should be referred to dermatology

The morphology and distribution are important clues to determine the diagnosis (see table on next slide, try printing it and using it on the following cases)
# Red Scaling Rashes

**Differential Diagnosis Table**

<table>
<thead>
<tr>
<th></th>
<th>Morphology</th>
<th>Distribution</th>
<th>Diagnostics (KOH, RPR, Biopsy)</th>
<th>Treatment</th>
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<tbody>
<tr>
<td><strong>Psoriasis</strong></td>
<td>Pink-red</td>
<td>Scalp, Elbows, Knees, Nails</td>
<td>consider KOH, biopsy</td>
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<td>Herald patch, “Christmas tree”</td>
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<td>SCLE: Chest, back</td>
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<td>KOH, consider biopsy if KOH is negative and you’re suspicious</td>
<td>Topical or oral antifungal</td>
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A simple approach

- **Is it tinea corporis?** First, do KOH to rule out fungus
- **If KOH is negative, is it psoriasis?**
  - Examine classic areas and ask about strep
  - A biopsy at this point could confirm this diagnosis or another skin disease
- **Could it be pityriasis rosea?**
  - Teens/20s, + herald patch, follows skin lines
  - Rule out secondary syphilis
- **Most other causes are steroid-responsive, either representing eczema, a drug eruption, or cutaneous lymphoma.** Treat with topical steroids if symptomatic and refer to a dermatologist.
Case One

Celia Miner
Case One: History

- **HPI:** Celia is a 31-year-old woman who presents with red circles on her arms and trunk for the past 7 months. They don’t itch.
- **PMH:** none
- **Allergies:** erythromycin (rash)
- **Medications:** none
- **Family history:** noncontributory
- **Social history:** stay-at-home mom
- **ROS:** negative
Case One: Skin Exam
Case One, Question 1

Celia’s exam shows annular *erythematous patches* with scale on the advancing edges and central clearing. Which is the best test to confirm the diagnosis?

a. Bacterial culture  
b. Direct fluorescent antibody (DFA) test  
c. Fungal culture  
d. Potassium hydroxide (KOH) exam  
e. Wood’s light
Case One, Question 1

Answer: d

Mrs. Majocchi’s exam shows annular erythematous patches with scale on the advancing edges and central clearing. Which is the best test to confirm the diagnosis?

a. Bacterial culture (would only get normal skin flora)
b. Direct fluorescent antibody (DFA) test (for herpes virus)
c. Fungal culture (more expensive, takes longer)
d. **Potassium hydroxide (KOH) exam** (can make the diagnosis in the office; inexpensive test)
e. Wood’s light (this does not fluoresce)
Excellent choice. You decide to do a KOH exam in the office.
Scrape the leading edge for fine scale
Click here to learn how to properly perform a KOH exam
Case One, KOH exam

Many translucent, branching, septate hyphae (arrows) in a positive potassium hydroxide preparation
Potassium hydroxide exam

- The first step in diagnosing a scaling annular rash on the body is to perform a KOH exam to rule out fungus
- “All that scales must be scraped” is a common mantra in dermatology
- Rule out dermatophyte infections before moving forward on scaling rashes
Mrs. Majocchi’s KOH exam is positive. Which of the following questions are important to ask?

a. Do you have a rash in your groin?
b. Do you have a rash on your feet?
c. Do you have any pets?
d. Do you take care of young children?
e. All of the above
Answer: e

Mrs. Majocchi’s KOH exam is positive. Which of the following questions are important to ask?

a. Do you have a rash in your groin? (associated tinea cruris)
b. Do you have a rash on your feet? (associated tinea pedis)
c. Do you have any pets? (cats can transmit a type of ringworm)
d. Do you take care of young children? (kids may have fungal infections on the scalp)

e. All of the above
Tinea corporis

- **Tinea corporis** (“ringworm”) classically presents as annular patches with peripheral scaling at the advancing edge and central clearing
  - Complete skin exam often reveals tinea cruris (“jock itch”) and tinea pedis (“athlete’s foot”). **Check these areas on full skin exam.**
- Tinea corporis is usually caused by *Trichophyton* and *Microsporum* species.
  - These dermatophytes appear as branching, septate hyphae. They do not have yeast forms as seen in tinea versicolor, caused by *Malassezia* spp.
Tinea cruris
Tinea pedis

Vesicles and bullae on the feet can be caused by tinea, eczema and other types of dermatoses.

*American Academy of Dermatology*
Tinea capitis
Mrs. Majocchi has athlete’s foot and extensive tinea corporis on her abdomen, chest, back, and arms. What is the best therapy for her?

a. Nystatin cream
b. Oral terbinafine
c. Terbinafine cream
d. Triamcinolone cream

a. Ultraviolet B (UVB) phototherapy
Case One, Question 3

Answer: b

Mrs. Majocchi has athlete’s foot and extensive tinea corporis on her abdomen, chest, back, and arms. What is the best therapy for her?

a. Nystatin cream (only works for Candida species)
b. Oral terbinafine (necessary for extensive tinea corporis)
c. Terbinafine cream (not good for extensive involvement)
d. Triamcinolone cream (could worsen infection or create tinea incognito)
e. Ultraviolet B (UVB) phototherapy (will not kill fungus)
Tinea incognito: fungus in disguise

- Even fungus gets less red with topical steroids
- Dermatophyte infections that appear better with steroids are called tinea incognito
- For scaly rashes not responding to steroids, do KOH exam
Tinea corporis treatment

- Counsel on foot care to prevent recurrence
- Localized involvement
  - Azoles (miconazole, clotrimazole) are *fungistatic* and must be used BID
  - Allylamines (terbinafine, naftifine) and benzylamines (butenafine) are *fungicidal*
    - These have higher cure rates and lower recurrence rates than azoles
- Extensive involvement may require oral antifungals (14-28 days of terbinafine)
Case Two

Jacques Gibert
Case Two: History

- HPI: Jacques Gibert is a 21-year-old French foreign exchange student visiting the United States. He presents for a routine college physical but mentions a scaly patch on his abdomen for the past few days. It itches a little bit.
- PMH: tonsillectomy as a child
- Allergies: penicillin (rash)
- Medications: none
- Family history: noncontributory
- Social history: college student; plays lacrosse; sexually active; moderate alcohol intake
- ROS: recent cold symptoms after moving into dorms
Case Two: Skin Exam
Case Two, Question 1

Jacques’s exam shows a single erythematous oval plaque with scaling. What is the first test should you get during his office visit?

a. Bacterial culture  
b. Gonorrhea culture  
c. Potassium hydroxide (KOH) exam  
d. Rapid plasma reagin  
e. Shave biopsy
Case Two, Question 1

Answer: c

Jacques’s exam shows a single erythematous oval plaque with scaling. What is the first test should you get during his office visit?

- a. Bacterial culture
- b. Gonorrhea culture
- c. Potassium hydroxide (KOH) exam
- d. Rapid plasma reagin
- e. Shave biopsy
Potassium hydroxide preparation

- Great job! You remembered that “All that scales must be scraped”
- Rule out dermatophyte infections before moving forward on scaling rashes
Potassium hydroxide preparation

• Negative KOH
In this case, the KOH exam is negative.
This does not bother him much, so you give him a mid-potency topical steroid cream to use BID as needed for itching.
Case Two, continued

- Jacques returns in 3 days for a rash on his chest, abdomen, and back (larger picture next slide)
- It only itches a little bit
- Exam shows oval salmon-colored patches with minor scale; the oval patches follow skin tension lines on the back
- Palms and soles are normal
- Repeat KOH exam is negative
Case Two
Jacques’s exam shows oval, salmon-colored scaling plaques on his trunk. What is the most likely diagnosis?

a. Guttate psoriasis
b. Nummular dermatitis
c. Pityriasis rosea
d. Secondary syphilis
e. Tinea corporis (tinea incognito)
Answer: c

Jacques’s exam shows oval, salmon-colored scaling plaques on his trunk. What is the most likely diagnosis?

a. Guttate psoriasis (doesn’t follow skin tension lines)
b. Nummular dermatitis (doesn’t follow skin tension lines)
c. Pityriasis rosea
d. Secondary syphilis (possible but not as common and does not have a herald patch)
e. Tinea corporis (tinea incognito) (KOH negative)
Pityriasis rosea (PR) is an acute exanthematous eruption that mainly occurs in young people

- Most patients are between the ages of 10 and 35
- The peak incidence is in late teens and early 20s
- Some studies suggest a possible viral etiology, but this has not been definitively proven

Usually asymptomatic, but patients may have associated flu-like symptoms

- Malaise, nausea, loss of appetite, gastrointestinal upset, upper respiratory symptoms
- Less commonly fever, swollen lymph nodes, pain, or sore throat are noted
Pityriasis rosea

- Classically starts with a “herald patch”
  - Annular erythematous 2-10 cm patch anywhere on the body, with peripheral scaling and central clearing
  - Patients often don’t remember or never had a herald patch

- The secondary phase erupts in a “Christmas tree” pattern
  - Similar oval patches and plaques erupt symmetrically over trunk and proximal extremities
  - They follow relaxed skin tension lines, thus giving the appearance of a “Christmas tree” on the back
  - The color is classically described as salmon-colored, but in darker skin types, it will be shades of purple, brown, or gray
  - Inverse pityriasis rosea is similar but localized to groin and axilla
Now let’s look at a few examples of pityriasis rosea
The elusive “herald patch”
Pityriasis rosea

- Note that in darker skin types the color varies in shades of brown, gray, or purple
- Some call it lilac or violaceous
Pityriasis rosea treatment

- Pityriasis rosea is self-limiting
  - The mean duration is about 5 weeks
  - More than 80% resolve by 8 weeks without treatment
  - Most patients only need to be reassured
- About 25% request treatment for mild to severe pruritus
  - Soothing anti-itch lotions available over-the-counter, topical steroids, and oral antihistamines may help
  - Quality evidence for these treatments is lacking
- Erythromycin given for 2 weeks helped improve the rash in one study, but subsequent studies failed to validate this
Case Three

Melvin Biette
Case Three: History

- HPI: Melvin Biette is a 46-year-old man who presents with a scaly red rash on his chest, abdomen, and back, for the past week. It does not itch.
- PMH: back pain
- Allergies: none
- Medications: ibuprofen as needed
- Family history: noncontributory
- Social history: works in office administration
- ROS: vague symptoms of headache, lack of appetite
Case Three: Skin Exam

[Image: back of the body with red rash]

[Image: feet with red rash]
Mr. Biette’s exam shows an eruption that looks like pityriasis rosea, but his soles and palms are involved. The office KOH is negative. What is the next test you should get during his office visit?

a. Bacterial culture
b. Fungal culture
c. Gonorrhea culture
d. Rapid plasma reagin
e. Shave biopsy
Case Three, Question 1

Answer: d

Mr. Biette’s exam shows an eruption that looks like pityriasis rosea, but his soles and palms are involved. The office KOH is negative. What is the next test you should get during his office visit?

a. Bacterial culture (no crusts to suggest impetigo)
b. Fungal culture (not likely positive if KOH negative)
c. Gonorrhea culture (joint pain, petechiae suggest this)
d. Rapid plasma reagin
e. Shave biopsy (not the best screening test for this)
Secondary syphilis

- Primary syphilis begins with a painless chancre
  - Patients often do not notice or recall the chancre
- The secondary phase comes weeks later
  - Prodrome may include malaise, fever, headache, stiff neck, myalgias, arthralgias, runny nose and eyes, and mental changes
  - The clinical rashes created by secondary syphilis are highly variable. Consider secondary syphilis in a patient with a new onset red scaly eruption.
Secondary syphilis

- Often presents as round to oval papules and plaques on the trunk and extremities, or a “papulosquamous” eruption similar to PR
- Variations include nodules, annular plaques, macules, follicular papules, oral erosions, flat verrucous perianal papules (*condyloma lata*), and others
- Involvement of **palms and soles** is characteristic, with round macules that may have collarettes of scale
Secondary syphilis

Notice the difference in the color of the rash when the patient’s skin color varies.
Secondary syphilis
Secondary syphilis: testing and treatment

- Consider syphilis with papulosquamous eruptions that look like pityriasis rosea
  - Especially if palms, soles, or mouth involved
- Confirm with serologic tests for syphilis
- Treatment for early syphilis remains intramuscular benzathine penicillin G
Case Four

Chris Koebner
Case Four: History

- **HPI:** Captain Chris Koebner is a 35-year-old Air Force pilot who presents with one week of small pink scaly round spots on his chest, abdomen, back, upper arms, thighs, and forehead. They itch somewhat.
- **PMH:** none
- **Allergies:** none
- **Medications:** none
- **Family history:** daughter had strep throat a month ago
- **Social history:** lives with wife and three children (ages 3, 7, and 9) on military base. Recent travel to Japan, Singapore, and Thailand, on military mission.
- **ROS:** mild sore throat for past two weeks
Case Four: Skin Exam
Captain Koebner’s exam shows many guttate (raindrop-like) scaly pink to bright red papules. They do not follow skin tension lines, and there is no oral, palm, or sole involvement. What is the first test you should perform?

a. Fungal culture
b. Potassium hydroxide (KOH) exam
c. Rapid plasma reagin
d. Shave biopsy
Answer: b

Captain Koebner’s exam shows many guttate (raindrop-like) scaly pink to bright red circinate papules. They do not follow skin tension lines, and there is no oral, palm, or sole involvement. What is the first test you should perform?

a. Fungal culture
b. Potassium hydroxide (KOH) exam
c. Rapid plasma reagin
d. Shave biopsy
You perform a KOH exam to rule out tinea corporis, and it is negative. What is the most likely diagnosis for Captain Koebner?

a. Guttate psoriasis
b. Nummular dermatitis
c. Pityriasis rosea
d. Secondary syphilis
e. Tinea corporis
Answer: a

You perform a KOH exam to rule out tinea corporis, and it is negative. What is the most likely diagnosis for Captain Koebner?

a. **Guttate psoriasis**

b. Nummular dermatitis (not associated with strep throat)

c. Pityriasis rosea (follows skin tension lines)

d. Secondary syphilis (can present this way and it is never wrong to order a screening test; no strep throat)

e. Tinea corporis (should have positive KOH)
Psoriasis

- Psoriasis is a common, chronic, inflammatory multi-system disease that mostly involves skin and joints.
- Classic plaque psoriasis presents as pink to bright red, well-demarcated plaques with silvery scale:
  - Usually located on extensor knees and elbows
  - Commonly involves scalp, umbilicus, gluteal cleft, and nails
- Guttate psoriasis presents as small “drop-like” scaly papules and plaques mostly on the trunk and extremities:
  - Often follows group A beta hemolytic streptococcal infections
Now let’s look at a few examples of different psoriasis presentations
Psoriasis vulgaris favors the extremities, nails, and interestingly, the umbilicus and the gluteal cleft.
Guttate psoriasis
Inverse psoriasis (in the folds)

In moist skin folds psoriasis will not be scaly
You correctly suspect guttate psoriasis, and obtain a throat culture. What treatment would you recommend for Captain Koebner’s psoriasis?

a. Desonide cream  
b. Oral prednisone  
c. Oral terbinafine  
d. Ultraviolet B (UVB) phototherapy
Answer: d

You correctly suspect guttate psoriasis, and obtain a throat culture. What treatment would you recommend for Captain Koebner’s psoriasis?

a. Desonide cream (not strong enough)
b. Oral prednisone (makes worse upon withdrawal)
c. Oral terbinafine (not fungal)
d. Ultraviolet B (UVB) phototherapy
Psoriasis treatment

- For limited psoriasis (less than 5% of BSA), topical therapies are first-line choices
  - **Potent topical steroids** should be used once or twice daily for thickened plaques on the body
- For extensive psoriasis, systemic therapy is often necessary
  - Narrow-band ultraviolet B phototherapy is very helpful in guttate psoriasis; it does not suppress immunity
  - Phototherapy usually requires office visits 2-3 times per week
- Patients with extensive psoriasis should be referred to dermatology to optimize treatment outcomes
Case Five

Jay Sulzberger
Case Five: History

HPI: Jay Sulzberger is a 35-year-old man who presents with three months of an extremely itchy red rash on his arms and legs.

PMH: seasonal allergic rhinitis, childhood eczema

Allergies: peanuts

Medications: loratadine

Family history: brother with asthma

Social history: lives with wife and two children

ROS: negative
Case Five: Skin Exam
Case Five: Skin Exam
Case Five

- Since this rash is scaly, you correctly start with a KOH exam, which is negative.
- The round eczematous plaques are on his arms, legs, and back.
- His scalp, umbilicus, nails, palms, and soles are unaffected.
Case Five, Question 1

Mr. Sulzberger’s exam shows erythematous, coin-like, scaling, weeping, crusted plaques on his arms and legs. What is the most likely diagnosis?

a. Guttate psoriasis
b. Nummular dermatitis
c. Pityriasis rosea
d. Secondary syphilis
e. Tinea corporis
Case Five, Question 1

Answer: b

Mr. Sulzberger’s exam shows erythematous, coin-like, scaling, weeping, crusted plaques on his arms and legs. What is the most likely diagnosis?

a. Guttate *psoriasis* (usually not weeping, crusted)

b. **Nummular dermatitis**

c. *Pityriasis rosea* (does not last this long, or weep)

d. Secondary *syphilis* (does not last this long, or weep)

e. *Tinea corporis* (KOH is negative, no central clearing)
Nummular dermatitis

Nummular dermatitis presents as multiple coin-shaped eczematous plaques on the extremities and trunk

- May be scaly but lacks the central clearing seen in tinea corporis and is KOH negative
- Very pruritic
- May exhibit weeping, cracking, vesicles, or crusts
- Pathology shows spongiotic dermatitis
Now let’s look at a few examples of nummular dermatitis
Nummular dermatitis
Nummular dermatitis
Nummular dermatitis

Red round scaling is seen in psoriasis and eczema
Case Five, Question 2

You diagnose Mr. Sulzberger with nummular dermatitis. What treatment would you recommend?

a. Desonide cream
b. Fluocinonide ointment (potent steroid)
c. Oral erythromycin
d. Oral terbinafine
e. Ultraviolet B (UVB) phototherapy
Case Five, Question 2

Answer: b

You diagnose Mr. Sulzberger with nummular dermatitis. What treatment would you recommend?

a. Desonide cream (not strong enough)

b. Fluocinonide ointment (potent steroid)

c. Oral erythromycin (for pityriasis rosea)

d. Oral terbinafine (not fungal)

e. Ultraviolet B (UVB) phototherapy (for guttate psoriasis)
Nummular dermatitis

- Treat like atopic dermatitis or any other eczema
- Potent topical steroids are necessary to control this type of eczematous eruption
- Apply emollients twice a day
Wrap-Up: After managing the previous five patients, can you fill in the missing information?

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# Wrap-Up: Red Scaling Rashes

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<td>Multifactorial inflammatory immune condition, with genetic and environmental influence. Favors Th17, 22-mediated immunity</td>
<td>consider KOH, biopsy</td>
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<td>Multifactorial inflammatory immune condition, with genetic and environmental influence. Favors Th2-mediated immunity</td>
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<td>Pink, annular Fine trailing scale Papules, patches, plaques</td>
<td>Herald patch, “Christmas tree”</td>
<td>Possibly a reaction to a viral infection (HHV-6 or 7)</td>
<td>KOH RPR</td>
<td>Observe Topical steroid Antibiotics</td>
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<td><strong>Lupus</strong></td>
<td>Pink-Red-Brown, Annular Variable scale SCLE: Chest, back</td>
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<td>Classical autoimmune disease (B-cell mediated)</td>
<td>Biopsy ANA, etc</td>
<td>SPF Topical steroids Antimalarials</td>
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<td><strong>Tinea</strong></td>
<td>Pink annular, patches and plaques with advancing scale</td>
<td>Anywhere with stratified squamous epithelium</td>
<td>Fungal infection (dermatophyte) of the epidermis</td>
<td>KOH, consider biopsy if KOH negative and you’re suspicious</td>
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Guidelines for consulting dermatology on the red scaly rash

1. The morphology and distribution are clues to the diagnosis, so it helps to critically inspect the individual lesions and perform a full skin exam.

2. “If it scales, scrape it”
   - For scaly patches, especially annular patches, perform a KOH
   - KOH can be difficult to interpret at first – you will get better with time & experience (and enough scale on the slide)

3. Try to avoid combination steroid-antifungal creams. Steroids can exacerbate cutaneous fungal infections.
Acknowledgements

- This module was developed by the American Academy of Dermatology Medical Student Core Curriculum Workgroup from 2008-2012.
- Primary author: Patrick McCleskey, MD, FAAD.
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References

To take the quiz, click on the following link:

https://www.aad.org/quiz/red-scaly-rash-learners-