Infectious Disorders of the Skin

Lakshi Aldredge, MSN, ANP-BC, DCNP, FAANP
VA Portland Health Care System
Portland, OR

Disclosures

* I am not representing the Veterans Health Administration
* Speakers' Bureaus/Consultant/Advisory Board:
  * AbbVie
  * Lilly
  * Celgene
  * Sanofi Genzyme
  * Regeneron
  * UBC

* Most images are kindly provided by VisualDx

Objectives

* Identify 3 common bacterial infections, their clinical presentations and treatments
* Identify 3 common presentations of fungal and candida infections and treatments
* Identify 3 common viral infections and their clinical presentations and treatments
* Identify 3 common parasitic infections and their clinical presentations and treatments

Approach to the Patient with Suspected Infectious Disease

* Assume all patients have an infectious disease (gloves, masks, biohazard suits)
* History, history, HISTORY!
  * Onset, symptoms, precipitating factors, travel, medications, household contacts, pets, immunosuppression
* Perform appropriate testing to ensure diagnosis PRIOR to treating if possible
* Follow up with patient to ensure treatment is effective

Infectious Disorders:

Bacterial

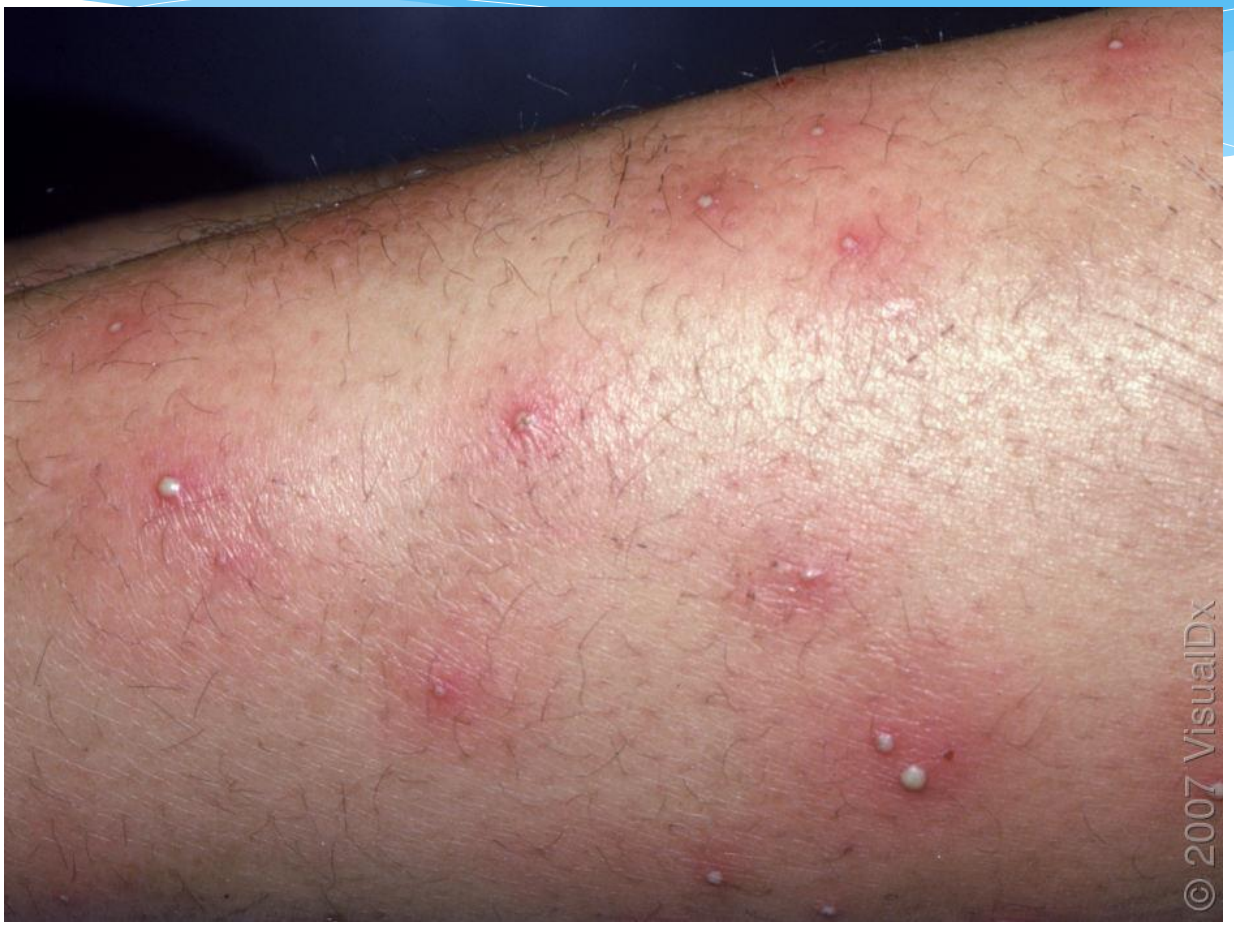
Bacterial infections

- Impetigo (Staph)
- Erysipelas (Strep)
- Necrotizing fasciitis (Strep)
- Erythrasma (Corynebacterium)
- Bacterial folliculitis
- Meningococcemia

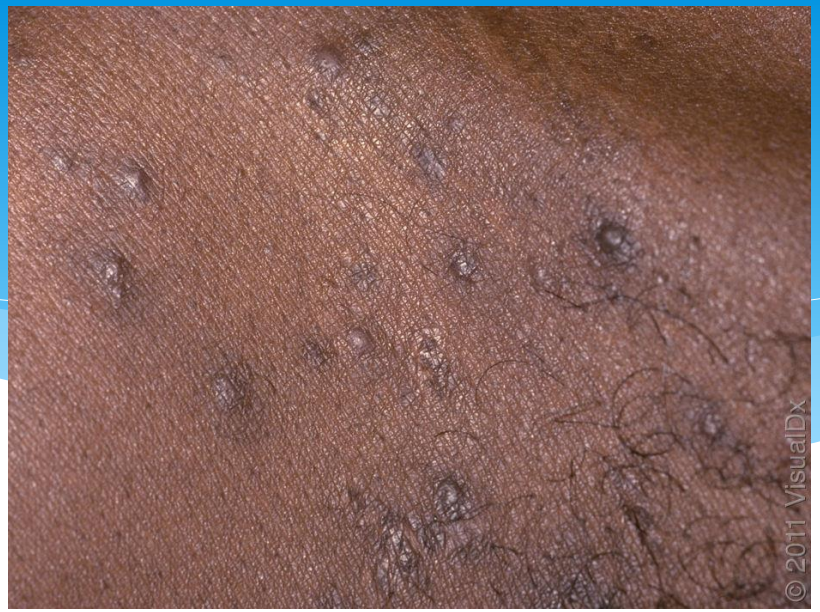
Just the Facts

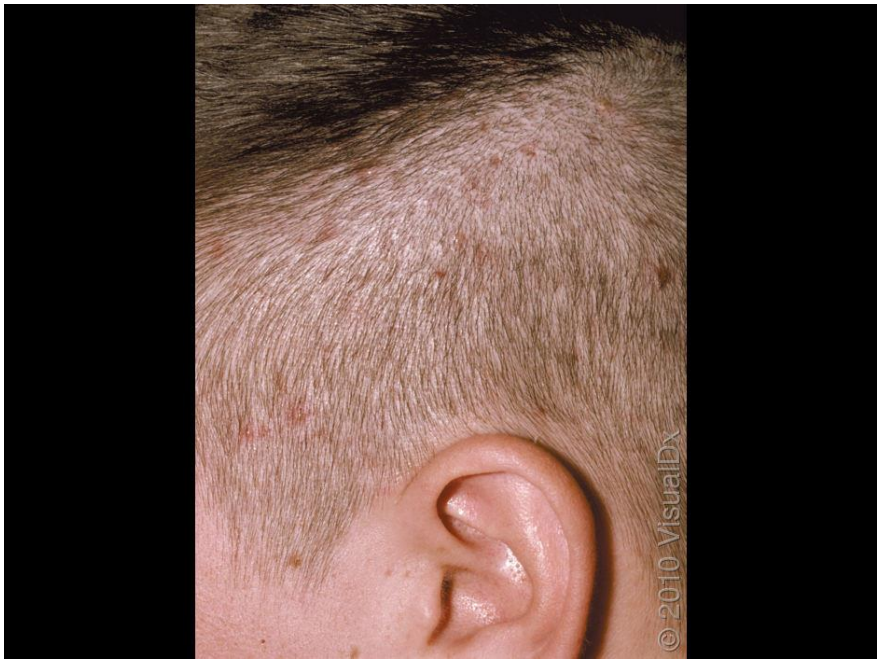
* 1 in 5 dermatologic patients are being seen for bacterial skin infections.
* In most healthy patients, streptococci and staphylococci cause the majority of skin infections.
* Appropriate and thoughtful antibiotic treatment is effective for most of these infections.
* In immunocompromised patients and patients with other systemic disease, treatment of infectious diseases can be more complicated.

Folliculitis



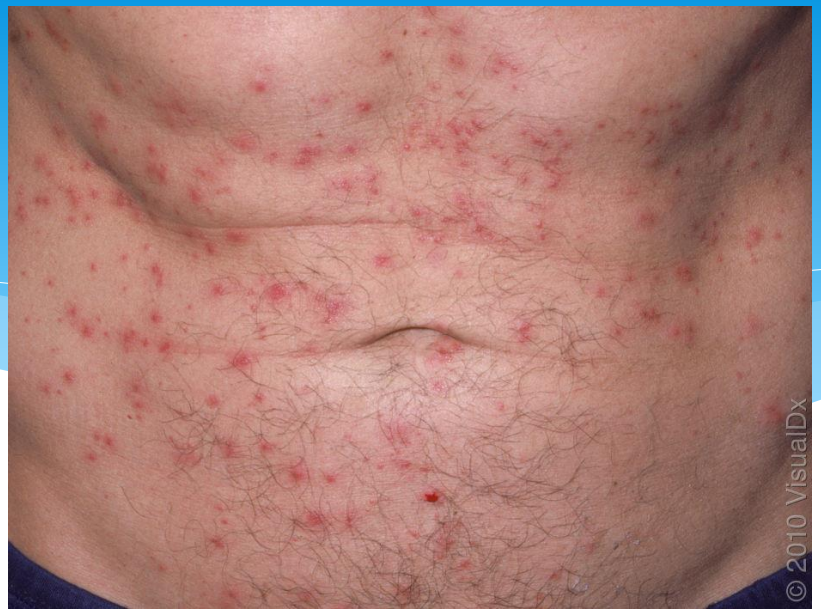
Folliculitis

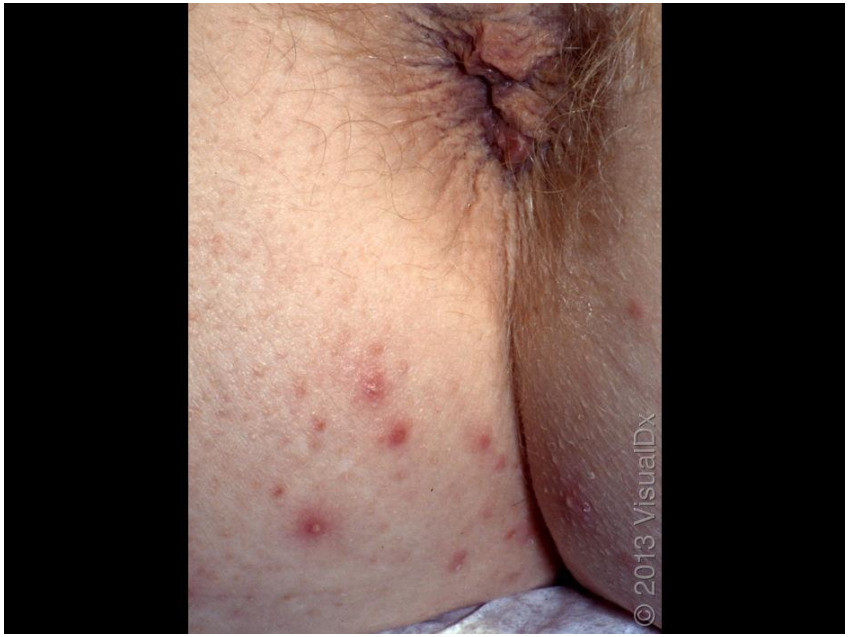




Folliculitis

* Inflammation of the hair follicle
* Papules and pustules
* Staph and strep most common
* Predisposing factors:
  * S. aureus in nares
  * Occlusion
  * Topical meds
  * Shaving
  * Exposure to oils, chemicals, contaminated water





Folliculitis

Tests

* C&S
* Viral swab
* KOH
* Biopsy for recalcitrant ds
* HIV if suspicious

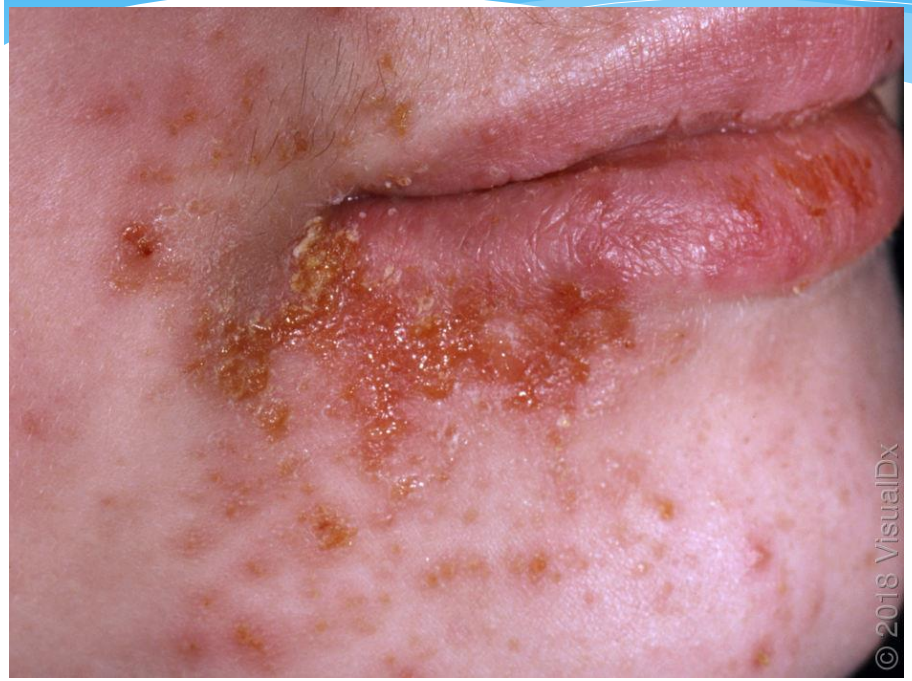
Treatments

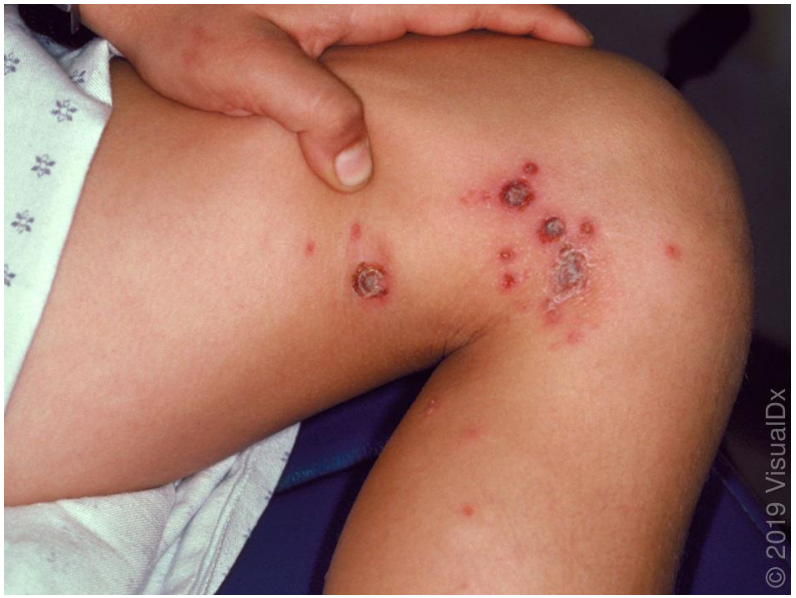
* Dicloxacillin 250 mg po q 6 hrs or
* Cephalexin 250-500 mg po q 6 hrs

MRSA

* Clindamycin 300-450 mg po q 6-8 hrs for 10-14 days, or
* Doxycycline 100 mg BID for 7-10 days, or
* Trimethoprim / sulfamethoxazole (160 mg / 800 mg) 1 DS tablet BID for 7-14 days

Impetigo





Impetigo

* Common, highly contagious, primarily affects children
  * S. aureus
  * Skin-to-skin contact
  * Small papule/vesicle, superficial erosion, honey-colored crusting
  * Face, nose, mouth, exts
  * Mild LAD occasionally

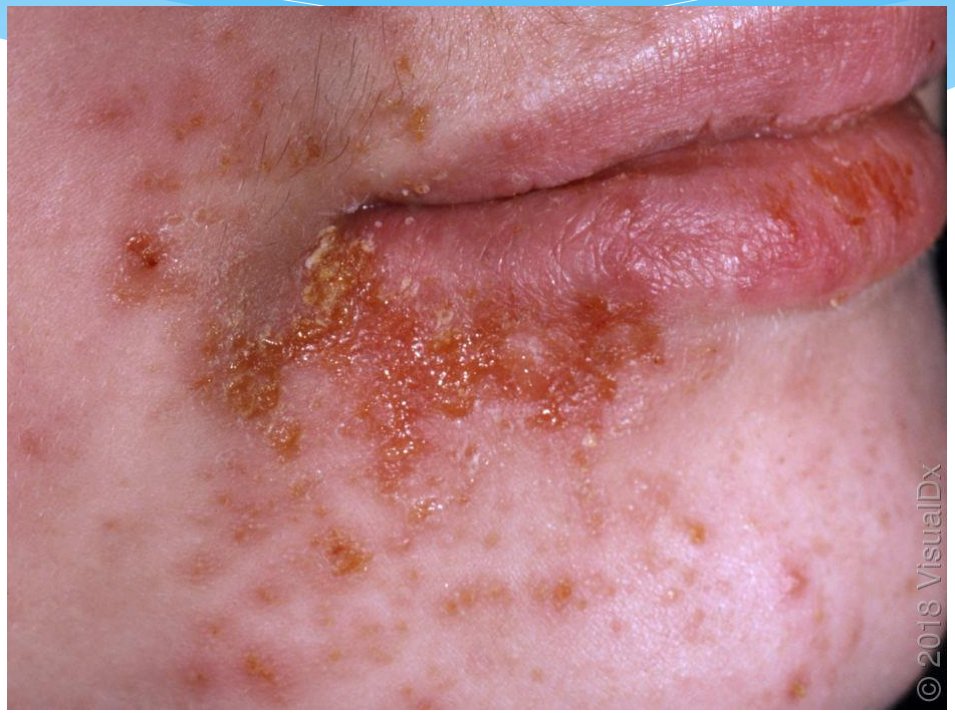
Tests:

* Culture not always necessary, but helpful to check for antibiotic resistance
* Staph aureus

Impetigo

TMT:

* CA-MRSA 1-10%
* Cleanse and remove crusts
* Burow's solution (aluminum acetate
* Treat nasal/perineal carriage



Impetigo Treatments

For widespread infection, the patient needs systemic antibiotics (7-day regimen) to clear the lesions.

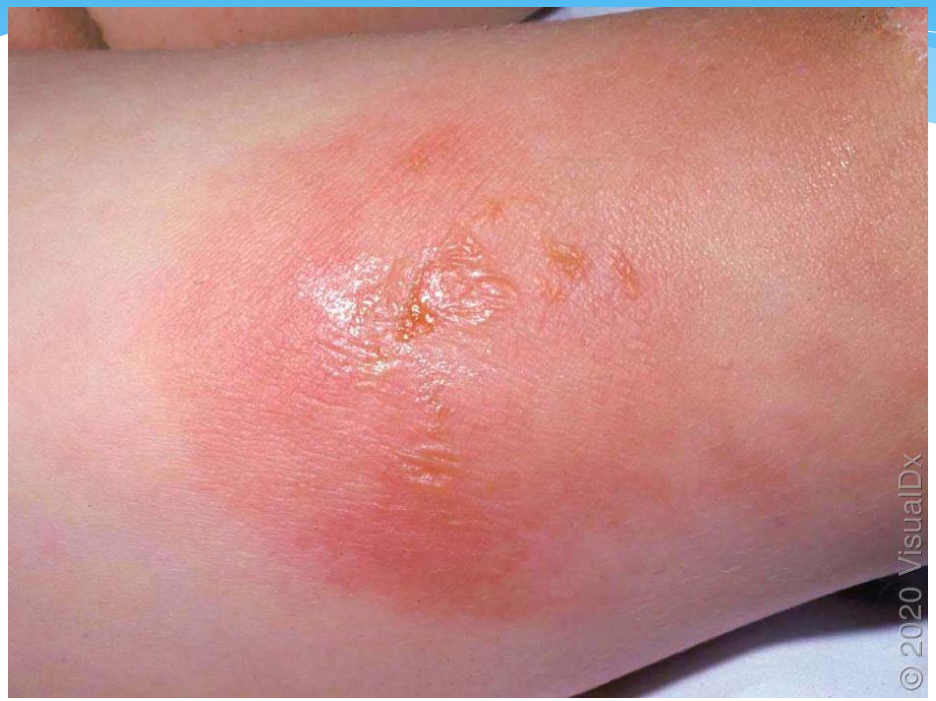
* Dicloxacillin 250mg po QID x 7 days or
* Cephalexin 250mg po QID x 7 days or
* Erythromycin 250mg po QID x 7 days

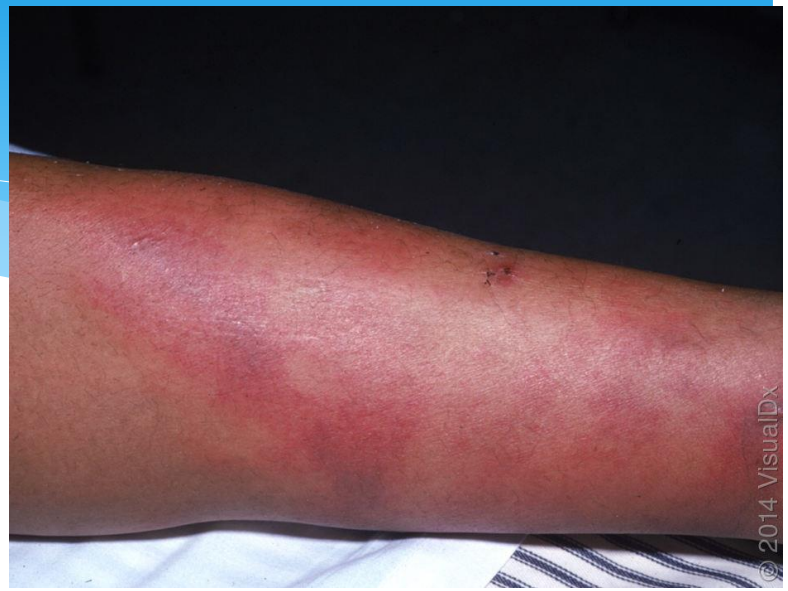
MRSA

* doxycycline 100 mg po BID or
* Bactrim DS i po BID or
* clindamycin 300 mg po TID x 2 weeks
* or as dictated by C and S results

Critically ill patients should be hospitalized and treated with IV antbx (vancomycin or linezolid)

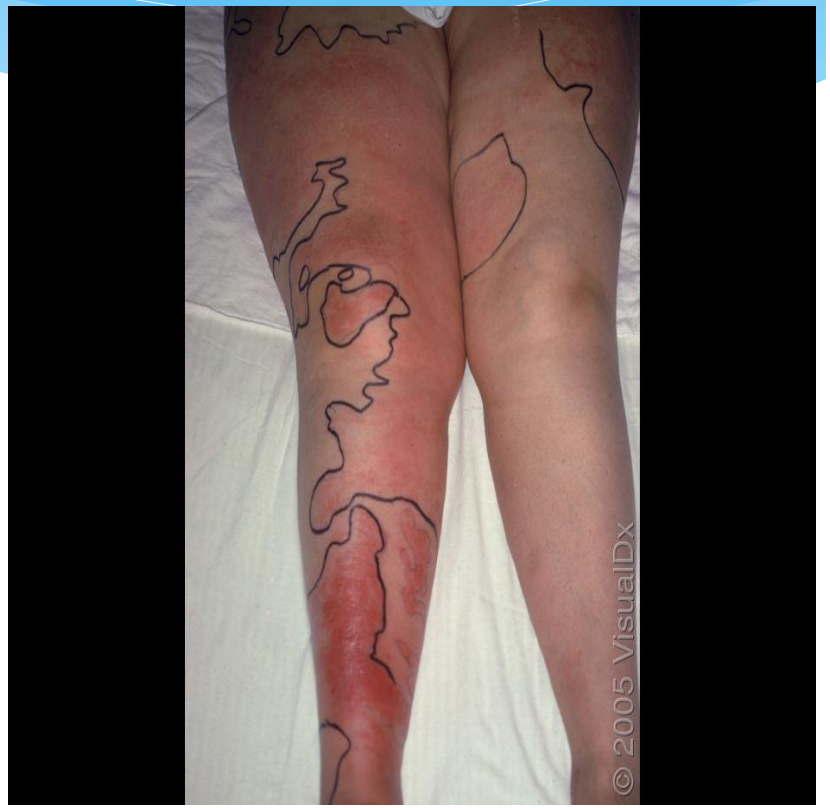
Erysipelas





Erysipelas

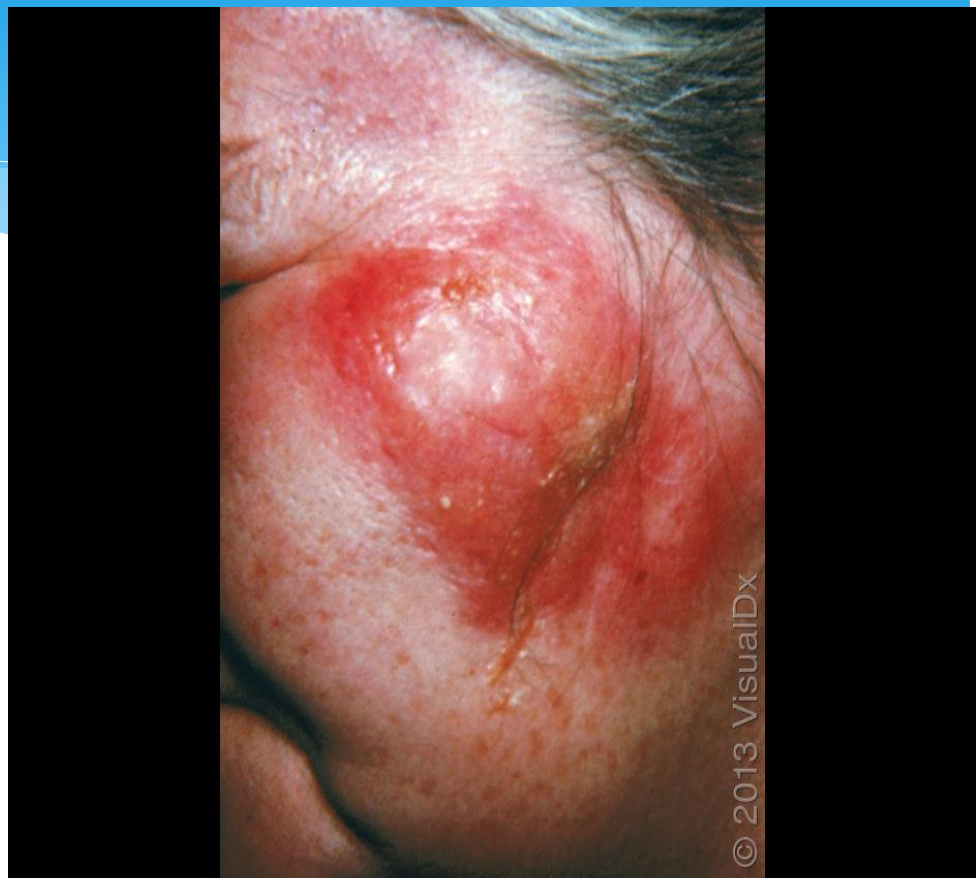
* Infection of the dermis with lymph involvement
* S. pyogenes
* Trauma in skin, tattoos
* Very young, aged, debilitated and those with lymphedema
* High fevers, rigors, fatigue, headache, vomiting: HOSPITALIZE
* Red, swollen, warm, hardened and painful rash, orange peel
* LAD, lymphedema
* Legs are affected most often
* Clinical diagnosis



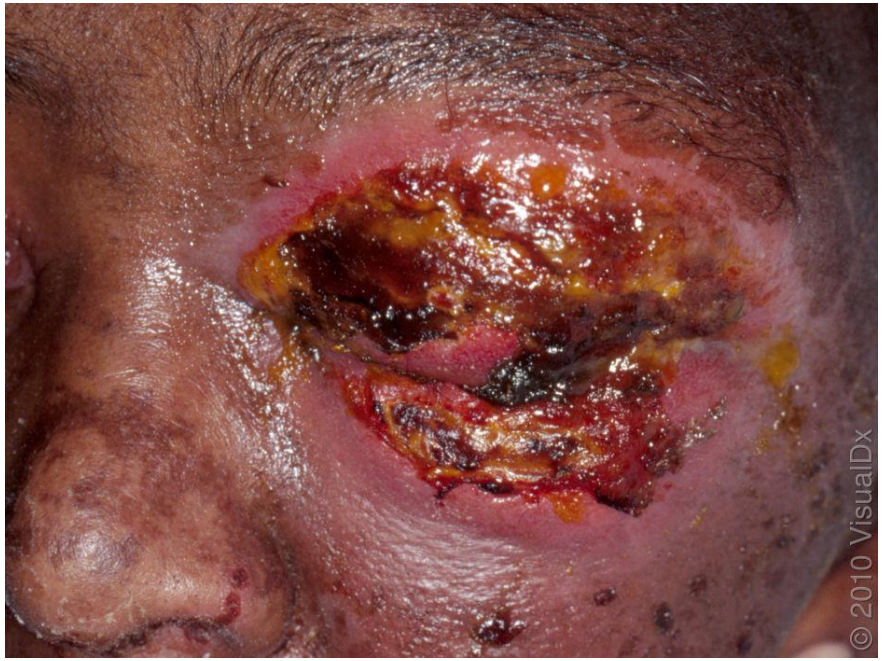
Erysipelas

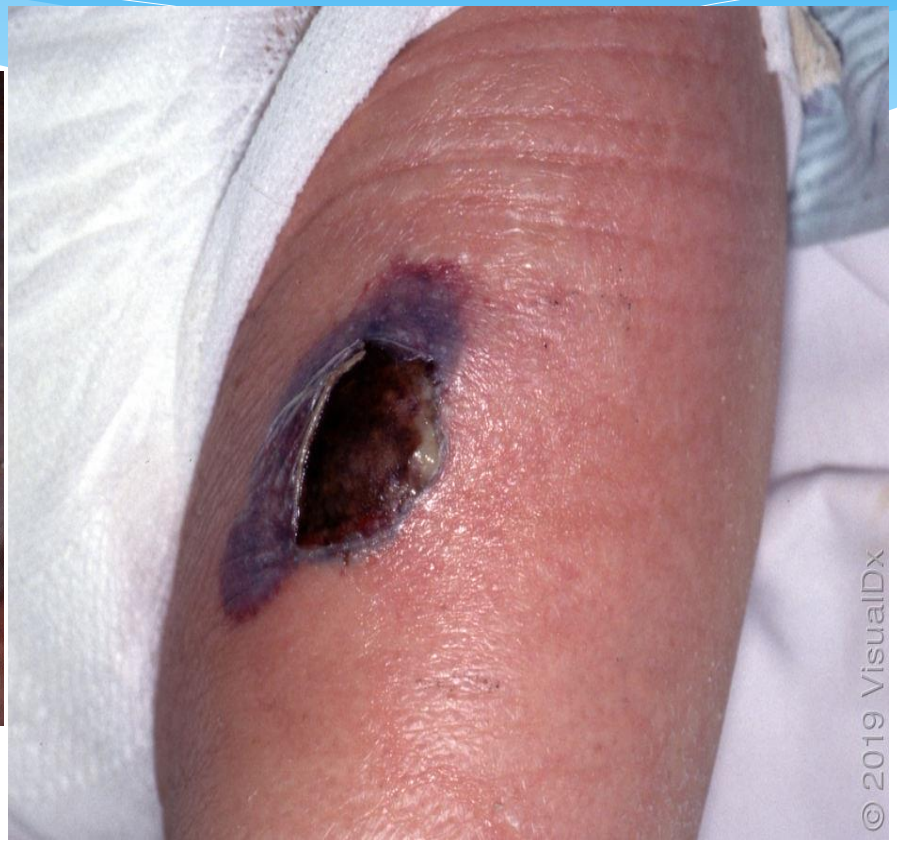
Treatment

* Penicillin V 250-500 mg PO QID for 10-14 days, or
* Penicillin G procaine 0.6-1.2 MU IM BID for 10 days
* Amoxicillin: 500 mg PO TID (or 875 mg BID) for 5-14 days, depending on patient response, infection severity, and/or immune status.
* Cephalexin (alternative): 25-50 mg/kg/day PO divided every 6 hours (maximum dose 500 mg/dose) for at least 5 days.
* Clindamycin (alternative): 300-450 mg by PO QID for 5-14 days, depending response/severity



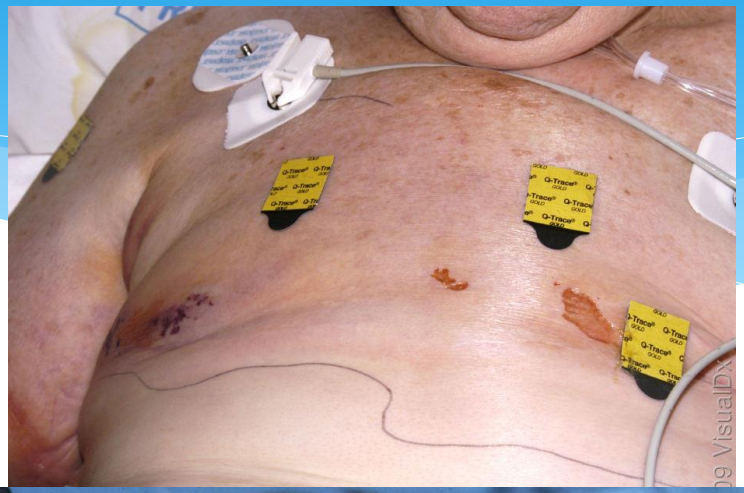
Necrotizing Fasciitis

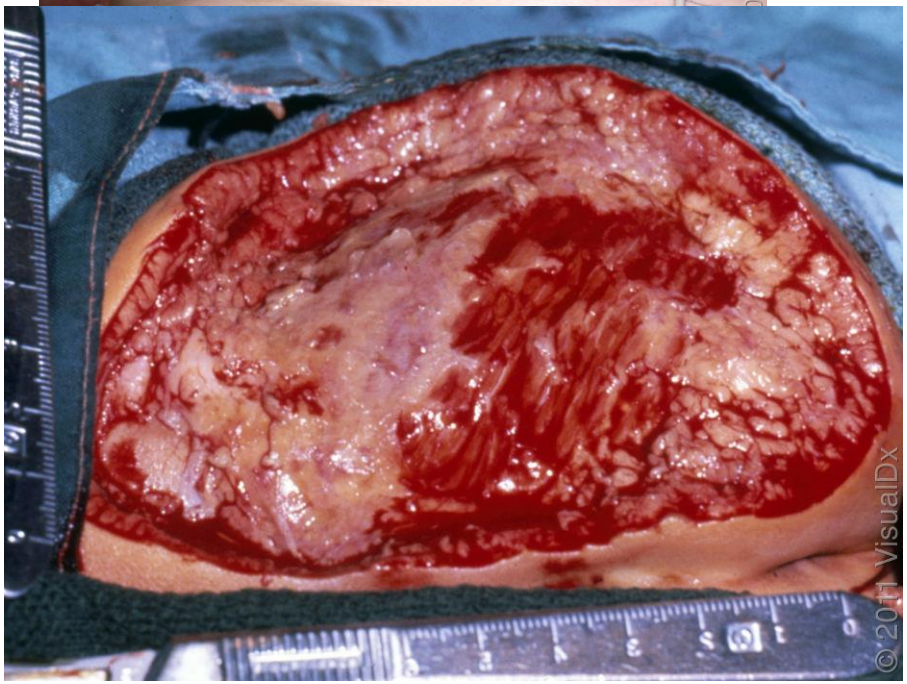




Necrotizing Fasciitis

* Necrotizing fasciitis "flesh-eating bacteria,"
* Deeper layers of skin and subcutaneous
* Many types of bacteria can cause necrotizing fasciitis
* *S. pyogenes* is most common cause
* May start at site of trauma
* Diarrhea and vomiting are common symptoms
* Fever, chills and appear very ill
* More severe cases progress within hours: HOSPITALIZE



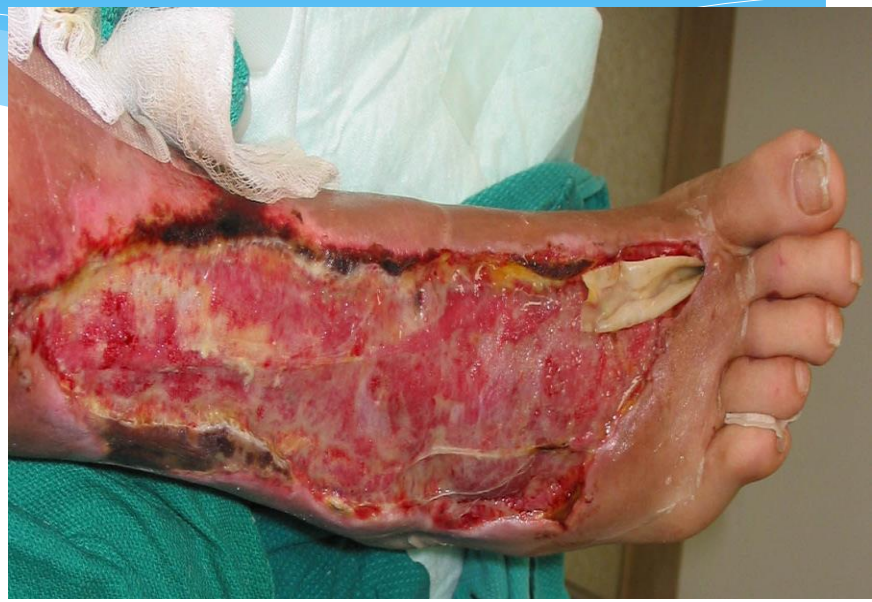


Necrotizing Fasciitis

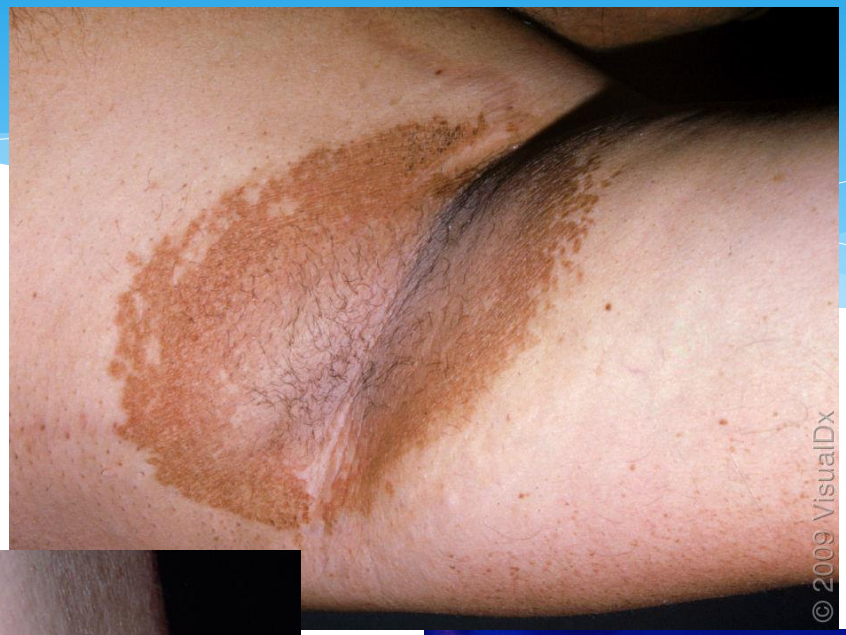
* Confirmed by cultures
* Early medical treatment is crucial and often presumptive
* Antibiotics should be started as soon as this condition is suspected.

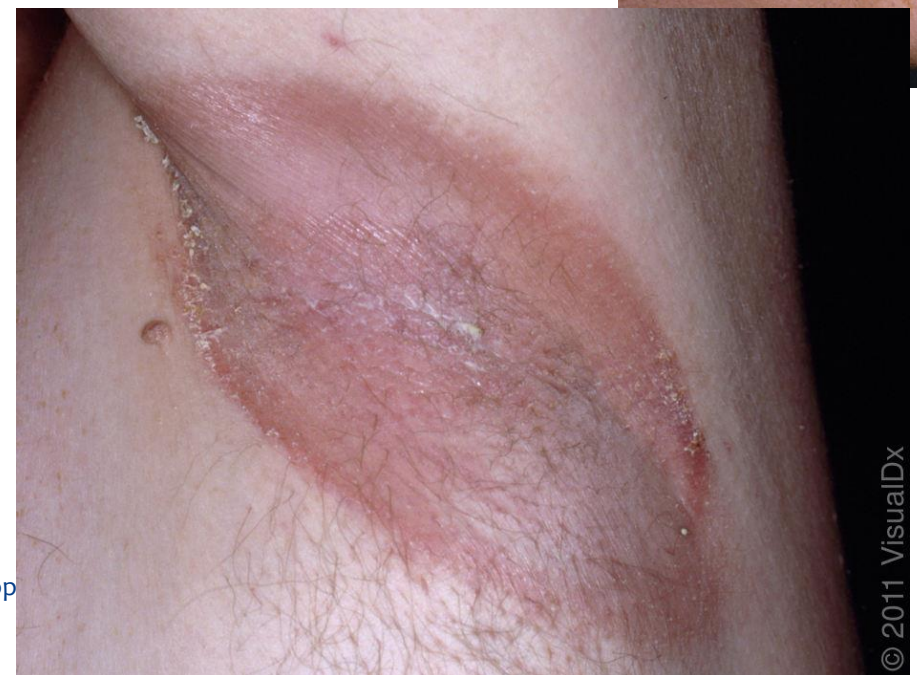
TMT:

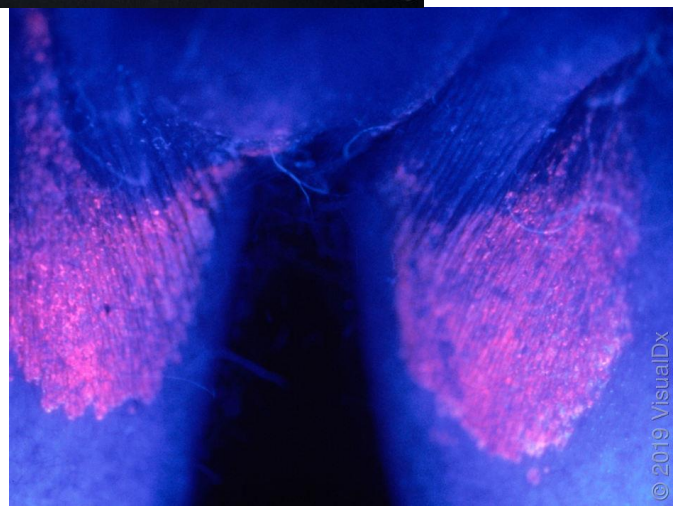
* Initial treatment: combo of IV antbx including PCN, vanco, clinda
* Prognosis can be bleak, with a mortality rate of approximately 25% and severe disfigurement common in survivors



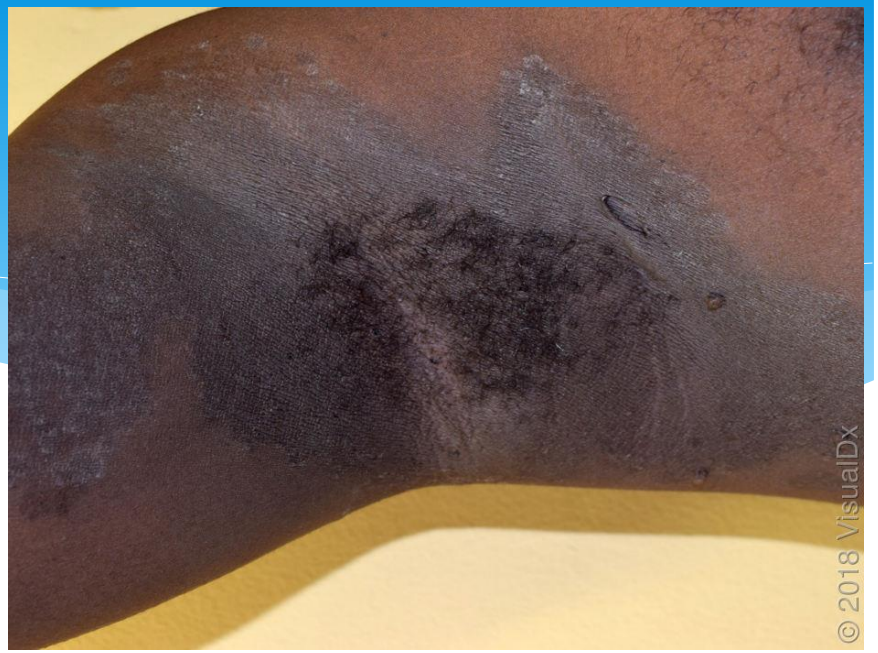
Erythrasma







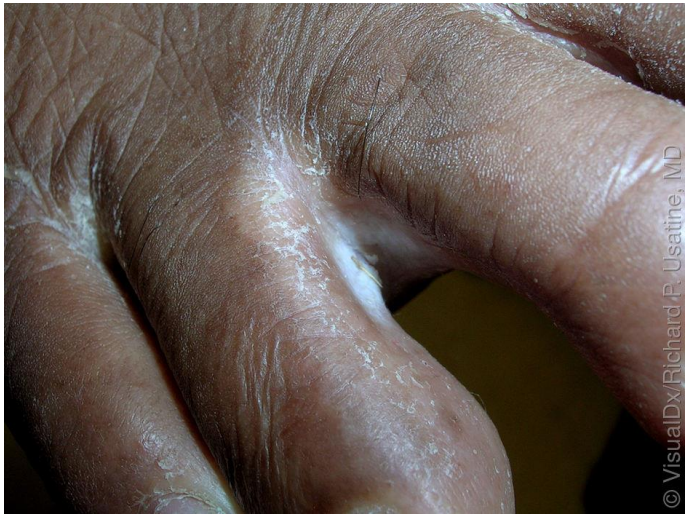
Erythrasma



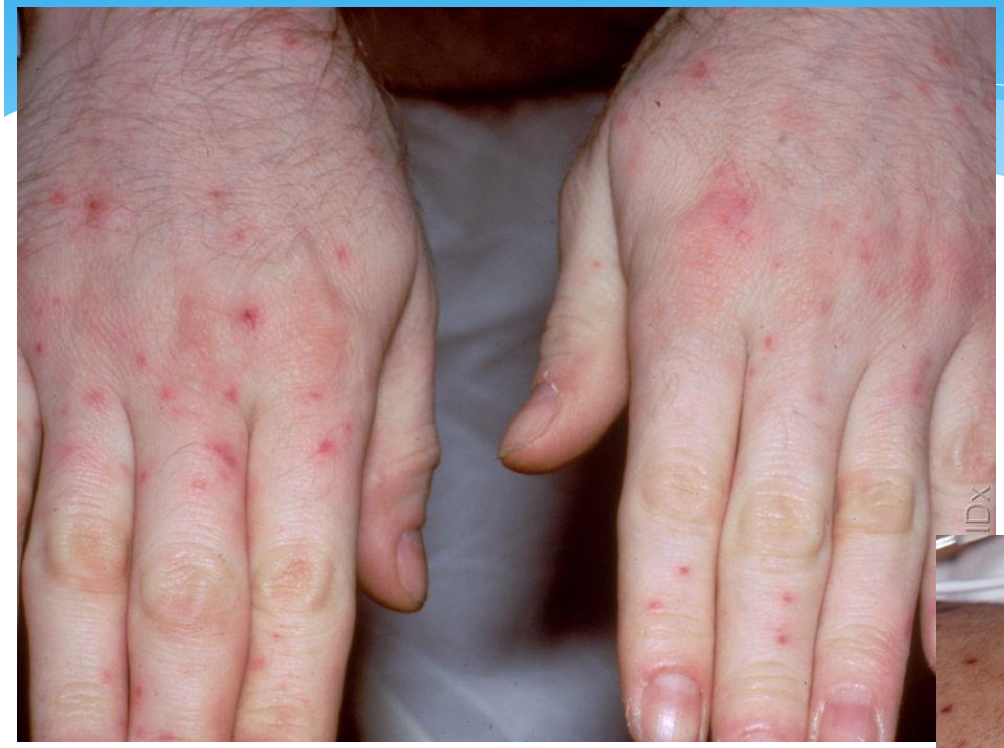
* Pink patches, which can turn into brown scales.
* Corynebacterium minutissimum
* Skin folds is common site
* Wood's lamp causes the organism to fluoresce a coral red color (porphyrin produced by the bacteria)

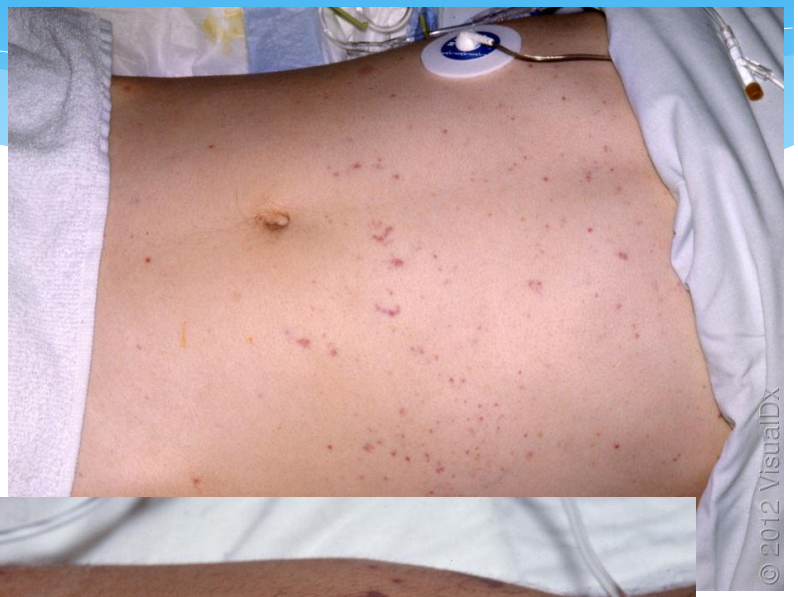
TMT:

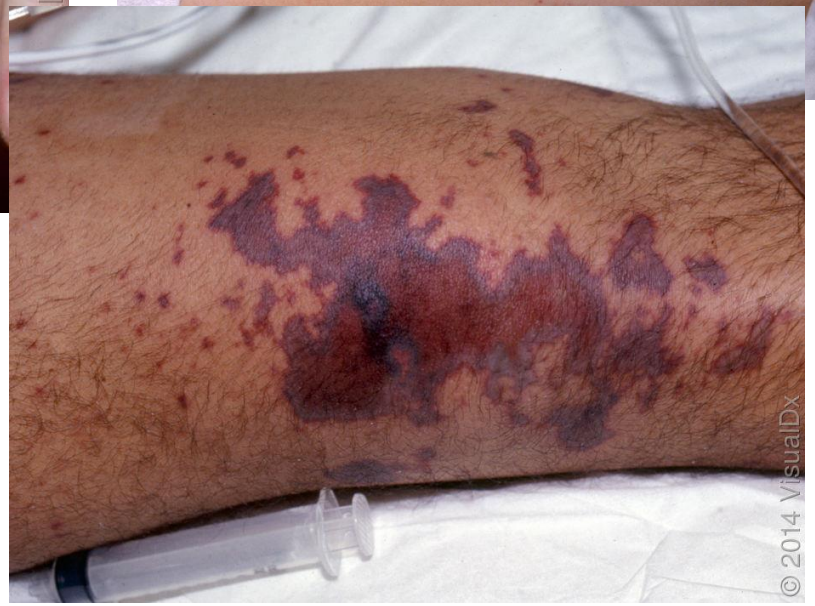
* Topical clindamycin or erythromycin for mild localized disease
* Oral erythromycin 500 mg po BID x 5 days



Meningococcemia

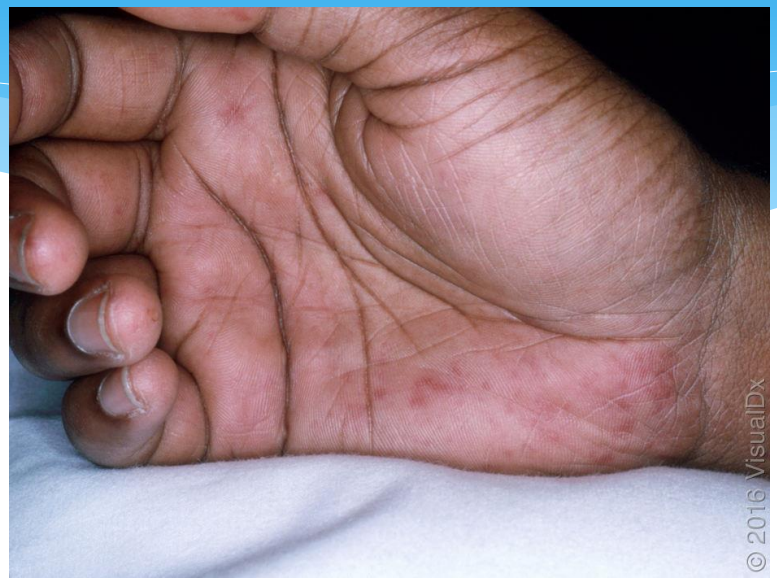


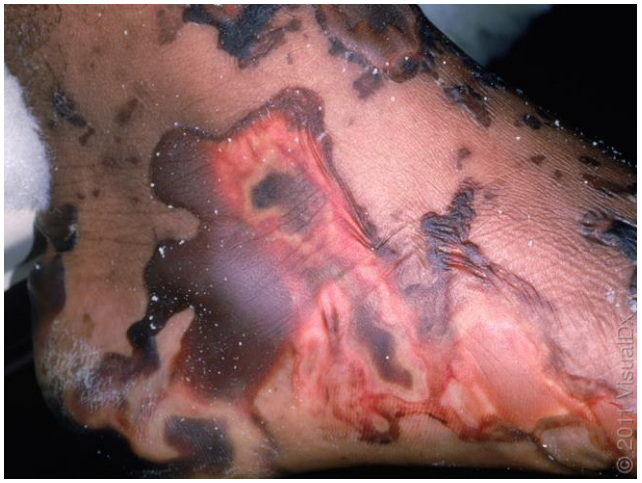




Meningococcemia

* Neisseria meningitidis
* Respiratory droplet transmission
* 5-10% in US
* Rash, pinpoint red spots (petechia)
* High fever
* Severe headache , malaise, nausea and vomiting: EMERGENCY
* Stiff neck
* Photophobia
* Mental status changes





Meningococcemia

* Neisseria meningitidis
* Blood culture, CBC, bx
* TIME IS OF THE ESSENCE!

TMT:

* Ceftriaxone 2 g IV/IM Q12
* Cefotaxime 2 g IV Q4
* Administer for 5-7 additional days after the patient's temperature has returned to normal.
* Prophylaxis for exposed contacts: PCN G, chloramphenicol for pcn-allergic

* Vaccine should be given to college students, military

Prophylaxis for Skin Procedures

* "The risk of IE is minute when incision, excision or biopsy is done through alcohol-prepared skin."

* "No published data demonstrate convincingly that the administration of prophylactic antibiotics prevents infectious endocarditis associated with bacteremia from any invasive procedure."

- *Circulation e-pub April 19, 2007*

DO NOT give antibiotics prophylactically for biopsies.
DO NOT use topical antibiotic to biopsy sites.

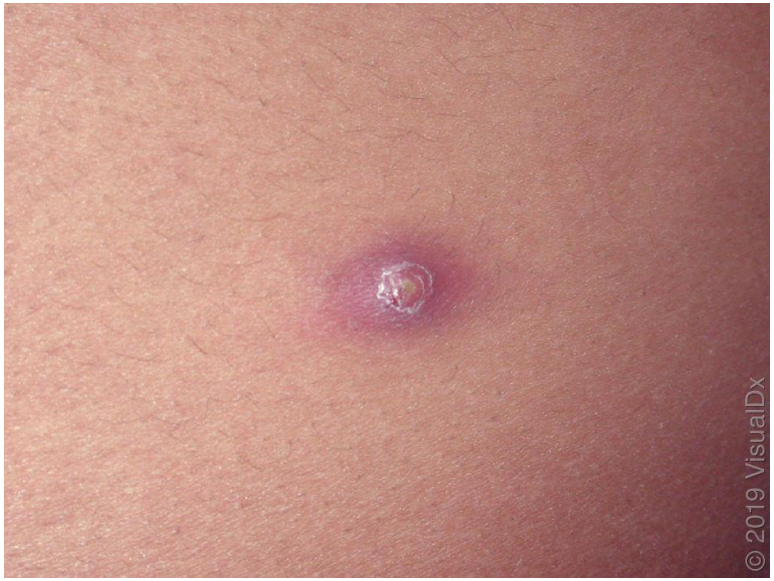
“Superbugs”

* MRSA
* VRE
* VRSA

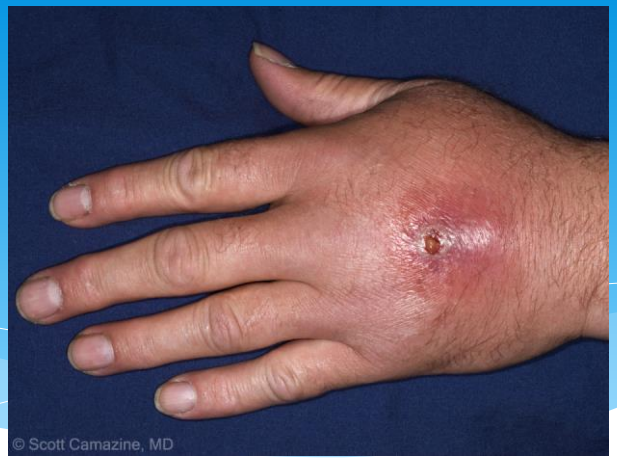
(Resistance is futile….)

MRSA

* Community-Associated MRSA (CA-MRSA): 50% of S. aureus isolates
* Skin and subcutaneous infections (spider bites, tattoos)
* Culture!
* I & D is primary tmt

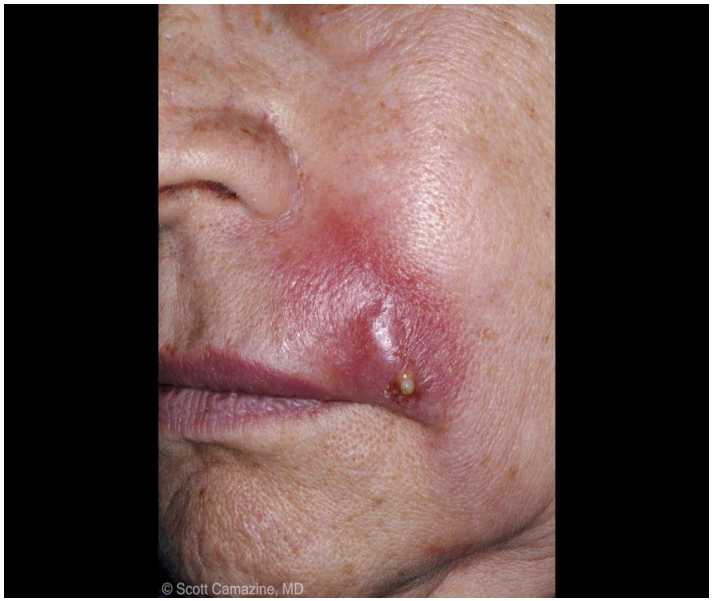


MRSA



Treatment

* Doxy 100mg BID x 10-14 days
* Clindamycin 300-450 mg po q8 5-10 days
* Amoxicillin 500 mg q8 PLUS either TMP-SMX 1-2 DS po q12 hours OR a tetracycline, doxycycline 100 mg po q12 for 5-10 days
* Linezolid 600 mg po q12 hours for 5-10 days



VRE

* *Enterococcus* that is resistant to the antibiotic vancomycin
* Found in the digestive and urinary tracts of some humans
* Particularly dangerous to immunocompromised individuals
* VRE have an enhanced ability to pass resistant genes to other bacteria
* VRE can be carried by healthy people who have come into contact with the bacteria.
* Nosocomial infections

VRSA

* Strain of *Staphylococcus aureus* that has become resistant to vancomycin, which is often a treatment of choice in infections with methicillin-resistant *Staphylococcus aureus* (MRSA).
* Vancomycin resistance is still a rare occurrence
* VRSA may also be resistant to meropenem and imipenem, two other antibiotics used in sensitive staphylococcus strains.

Antibiotic Resistance

* Evolution of "superbugs" and ability to evolve and adapt
* Indiscriminate use of antibiotics

NO TOPICAL ANTIBIOTICS!!!!!

* Lack of public health policy
* Lack of new drugs (not profitable)

Triclosan

* Tea Tree® Therapy Liquid Soap
* Clearasil® Daily Face Wash
* Clean and Clear® Foamy Cleanser
* DermaKleen® Lotion Soap
* CVS antibacterial soap
* Garden Botanika® Powder Makeup
* Movate® Skin Lightening Cream
* Aveeno® Therapeutic Shave Gel
* Gillette® Complete Skin Care Gel

Infectious Disorders:

Fungal

Fungal Infections

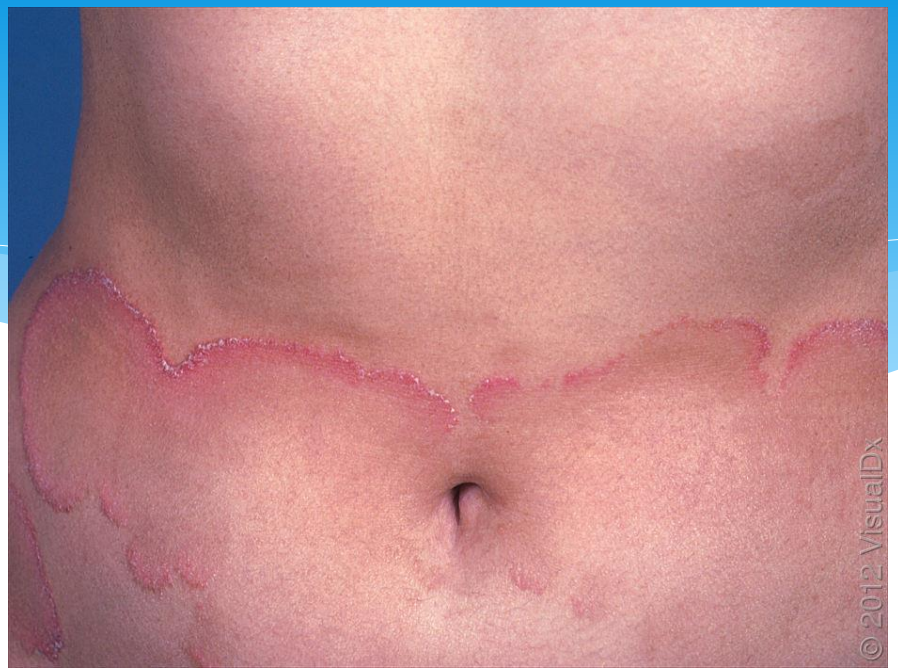
- Tinea infections
- Tinea versicolor
- Candidiasis

Tinea

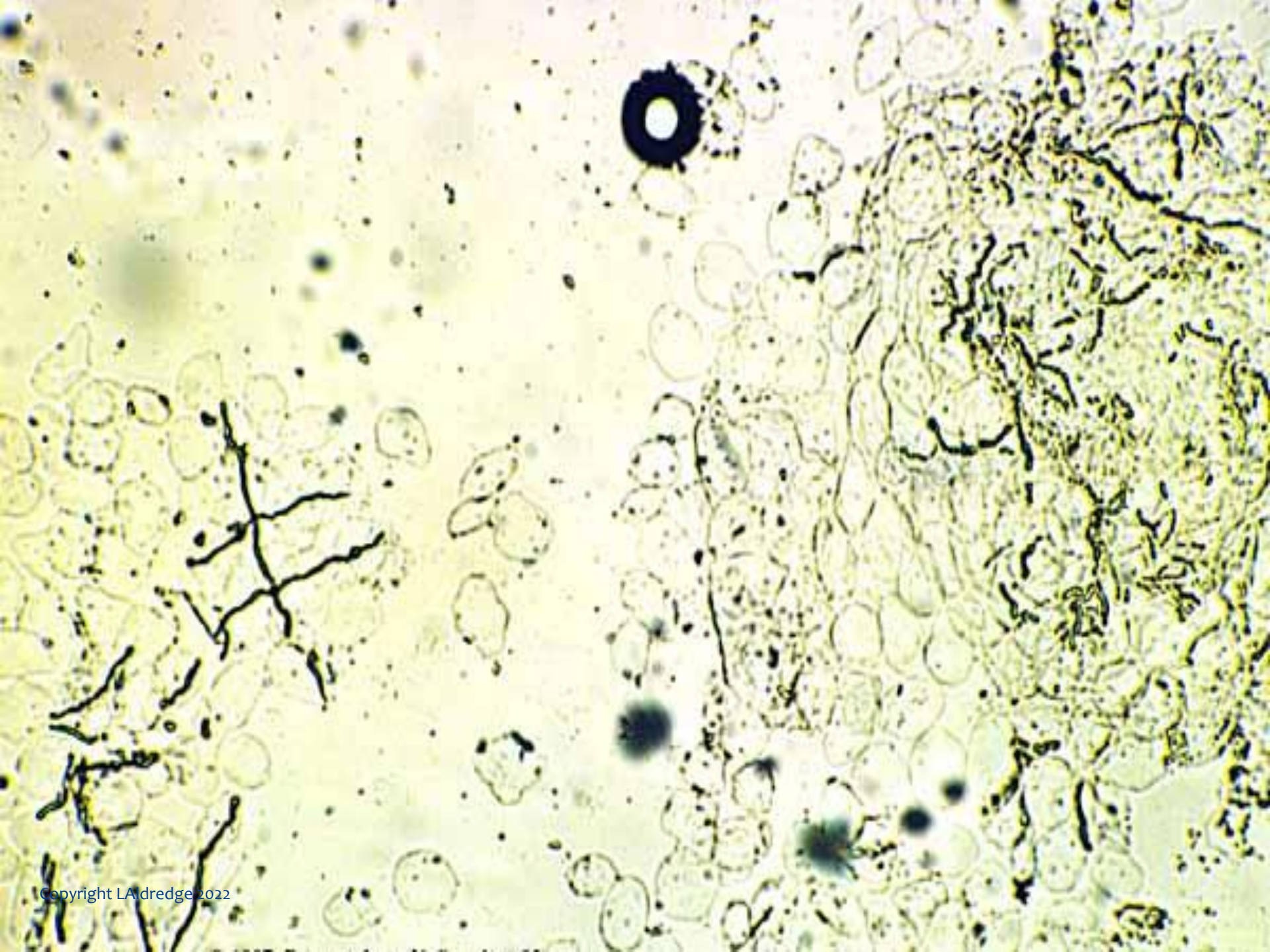
* Well-demarcated, erythematous patches or thin plaques
* Fine or thick scaling
* Most common on feet, toenails, groin

TMT:

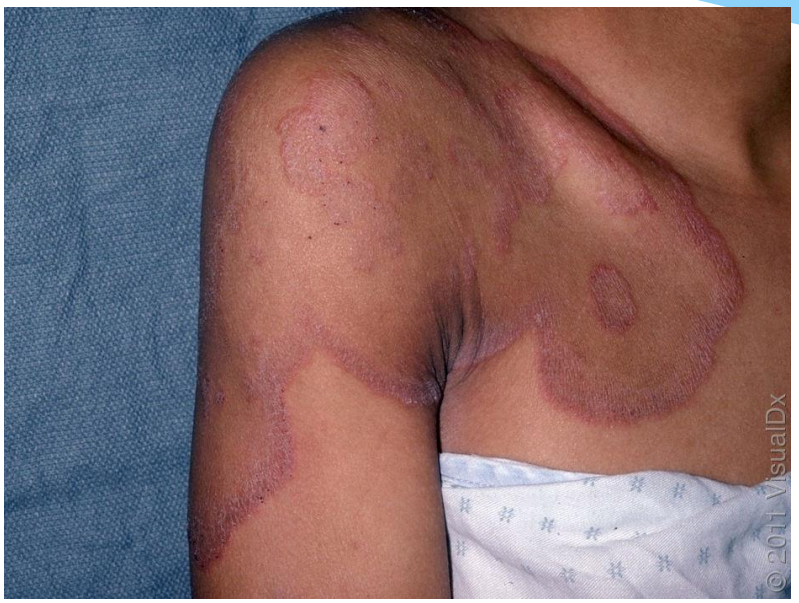
* Clotrimazole cream
* Terbinafine 250mg QD x 30d or 90d (nails)
* Hygiene and skin care

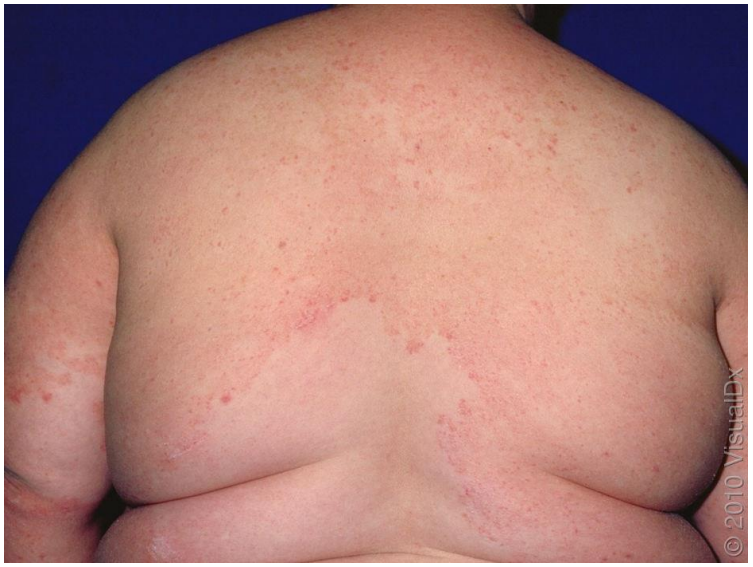


Culture and/biopsy if not improved to rule out other conditions!

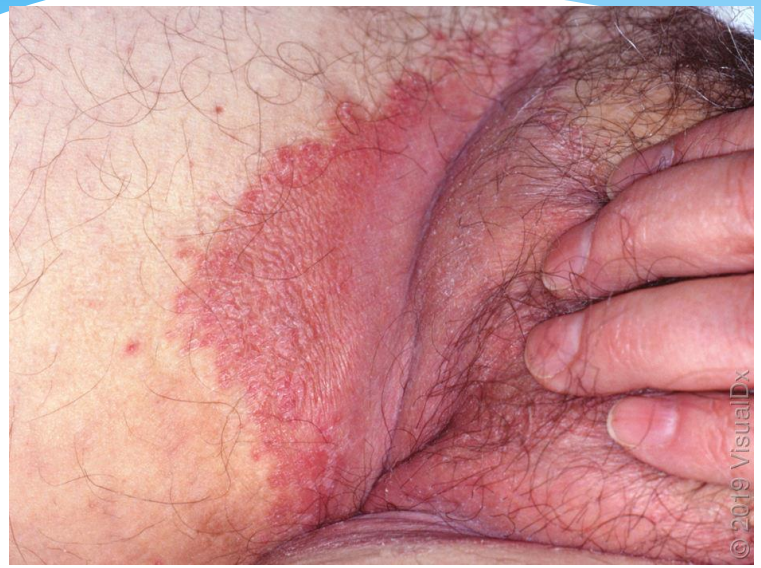


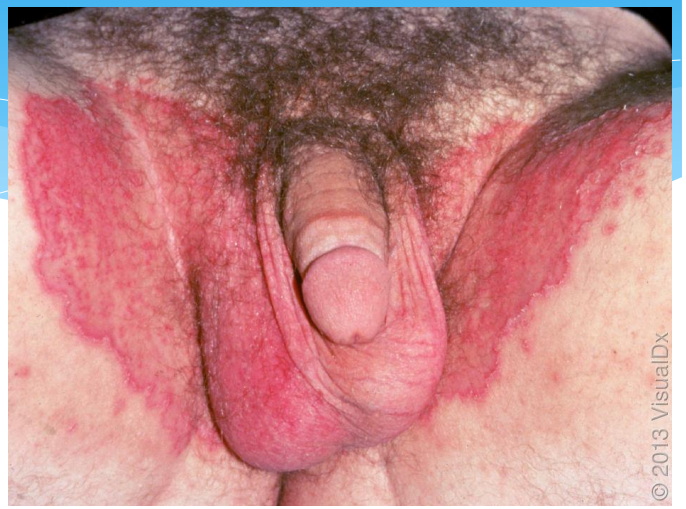
Tinea corporis

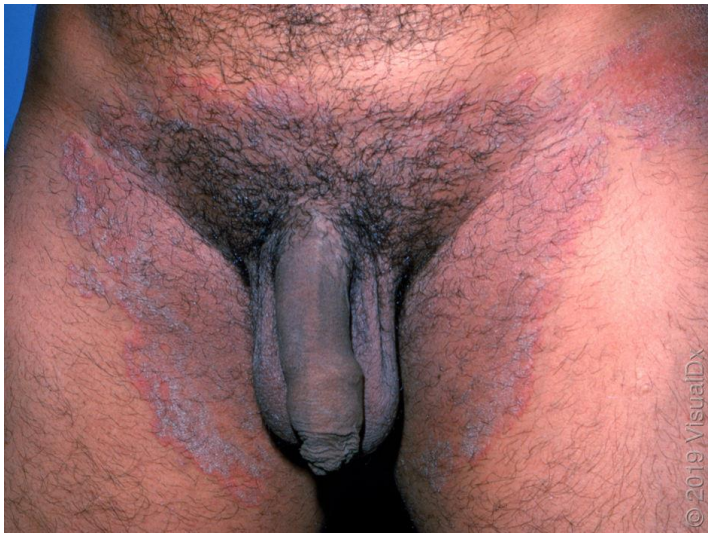




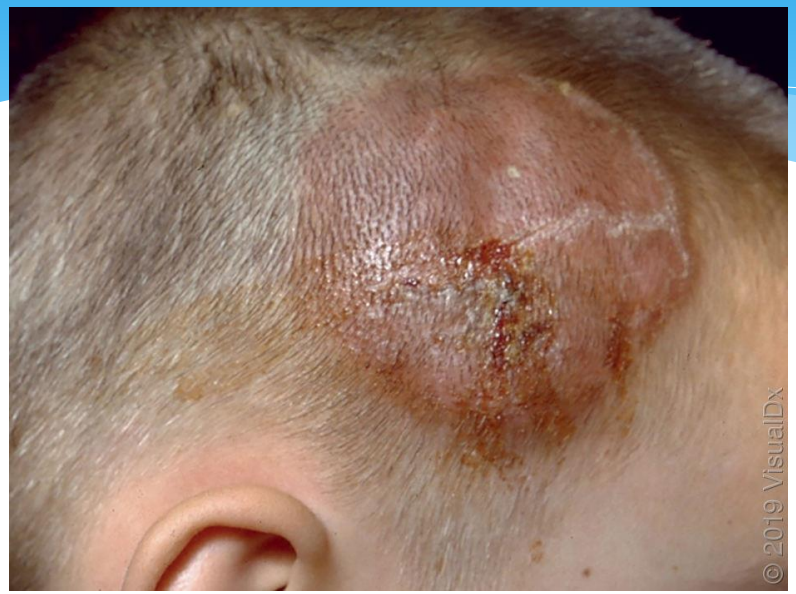
Tinea cruris

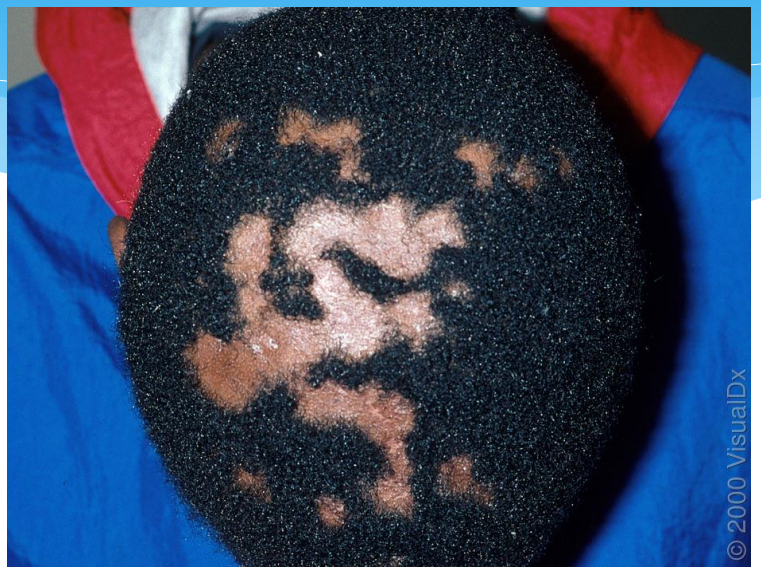


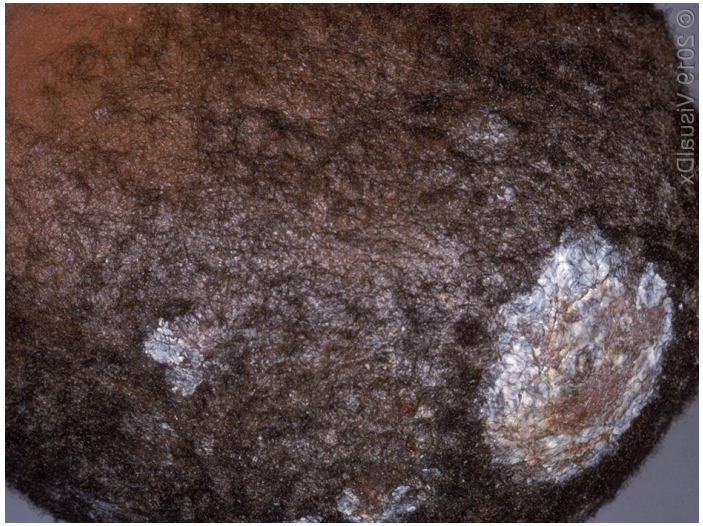




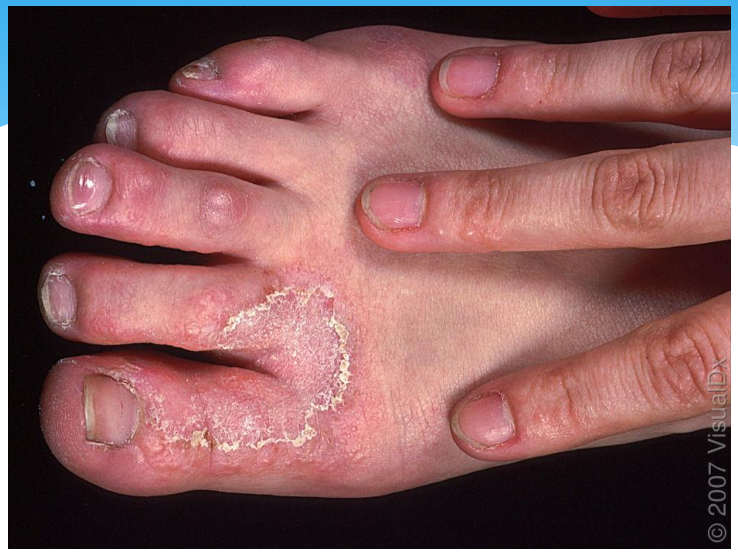
Tinea capitus

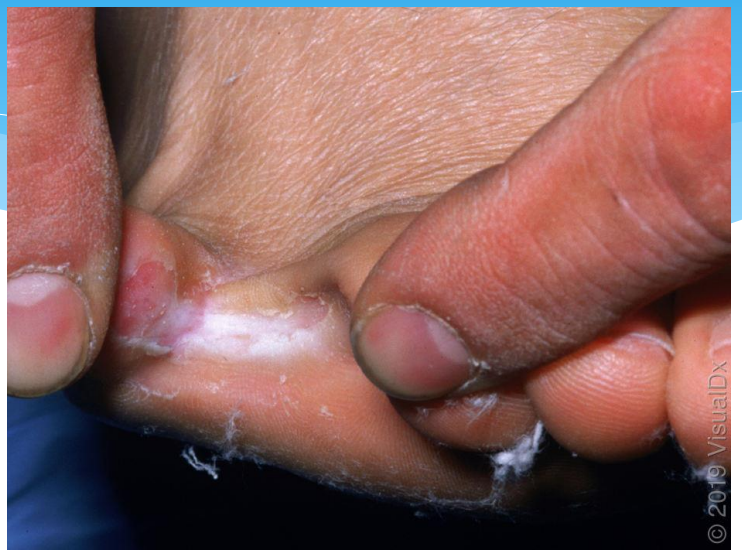


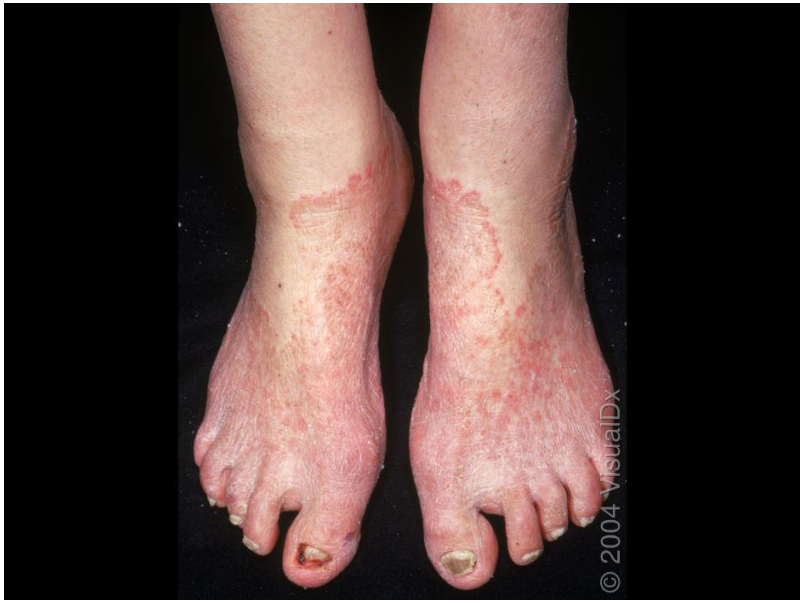




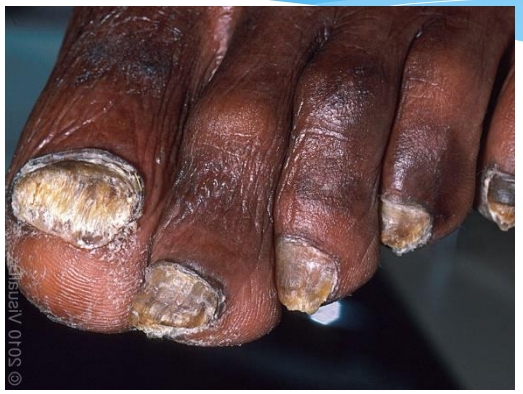
Tinea pedis

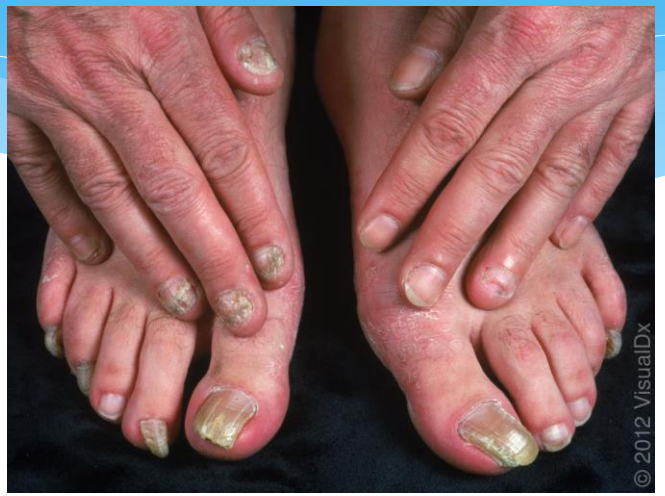


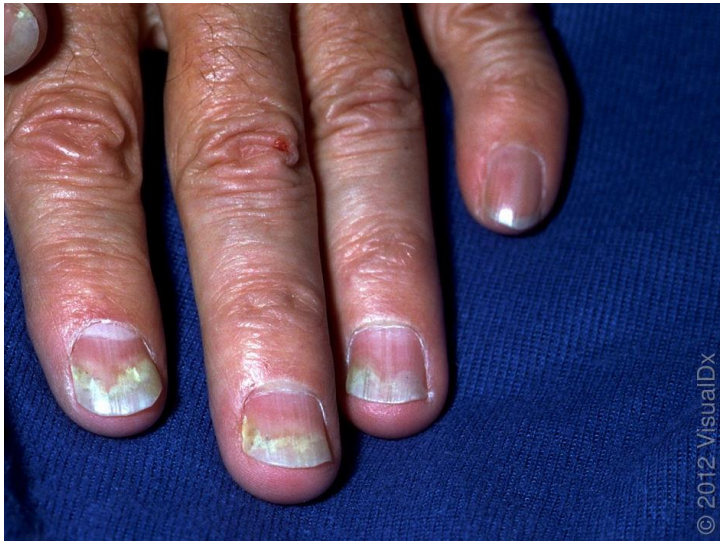




Tinea unguium (Onychomycosis)

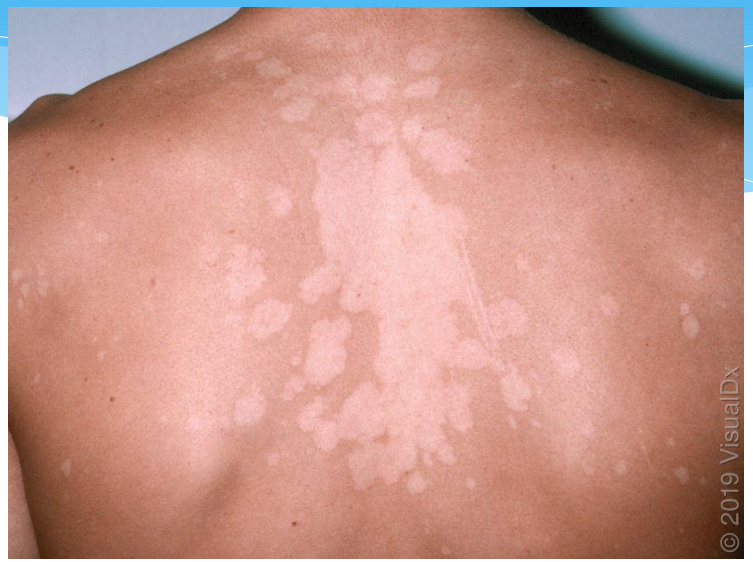




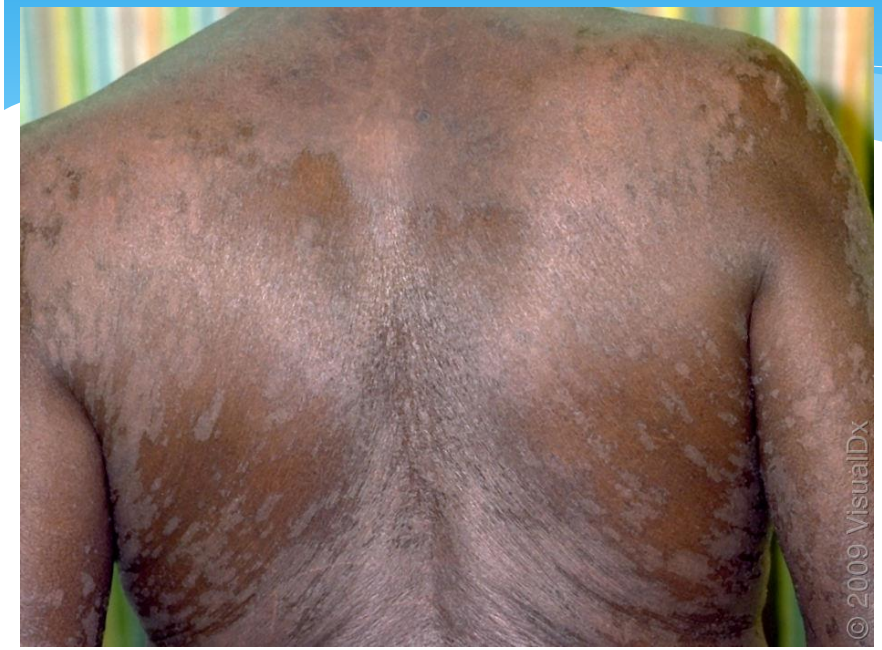


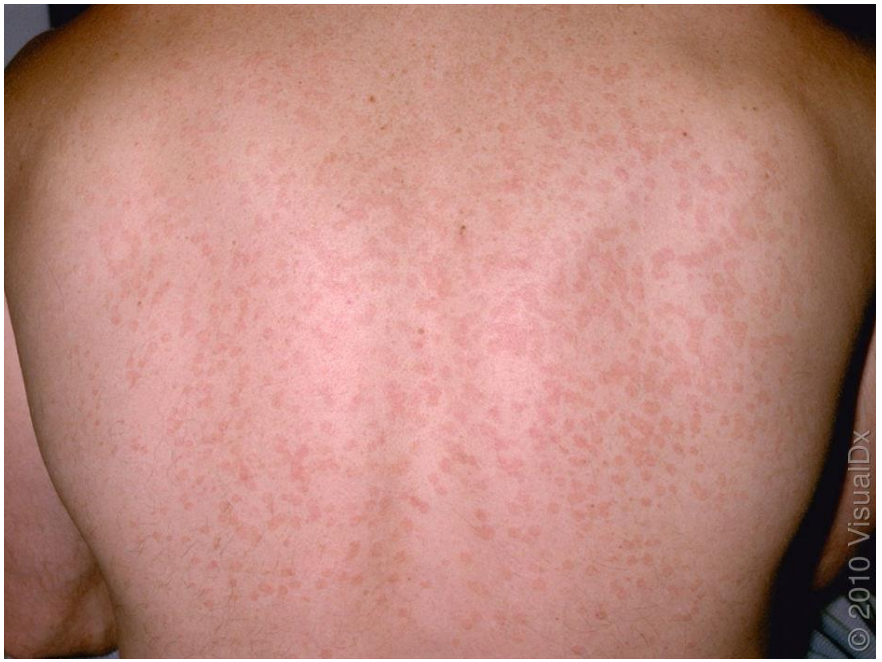
Tinea versicolor

* Asymptomatic, common, chronic
* Multiple macular patches of all sizes and shapes, and varying in pigmentation from white, tan, pink brown
* Lipophilic yeast, Malassezia furfur (normal flora of human skin)
* Most commonly seen in young adults



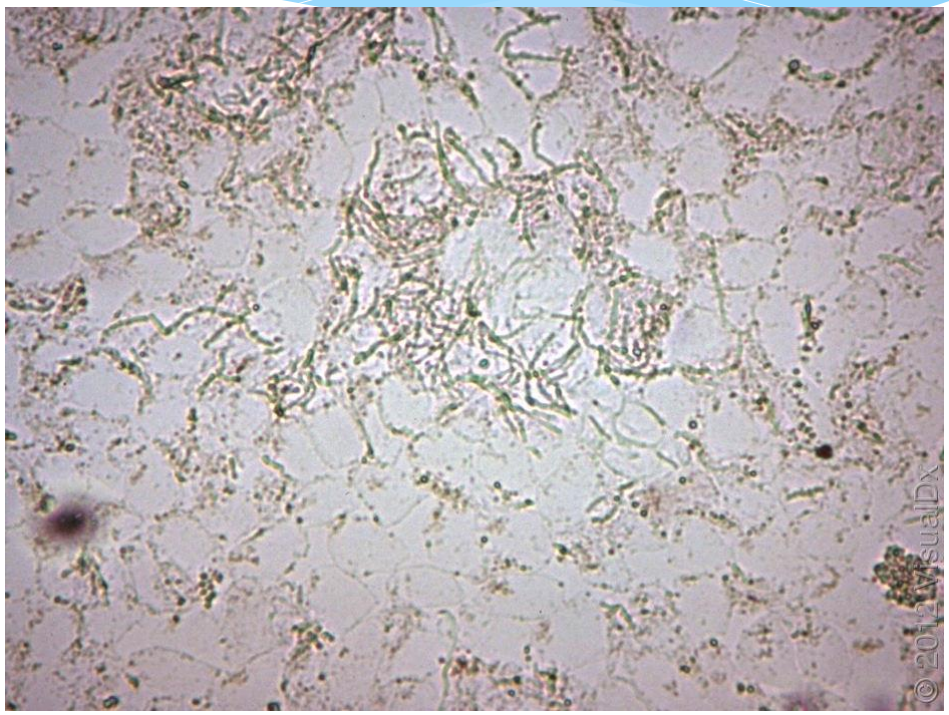
Tinea Versicolor





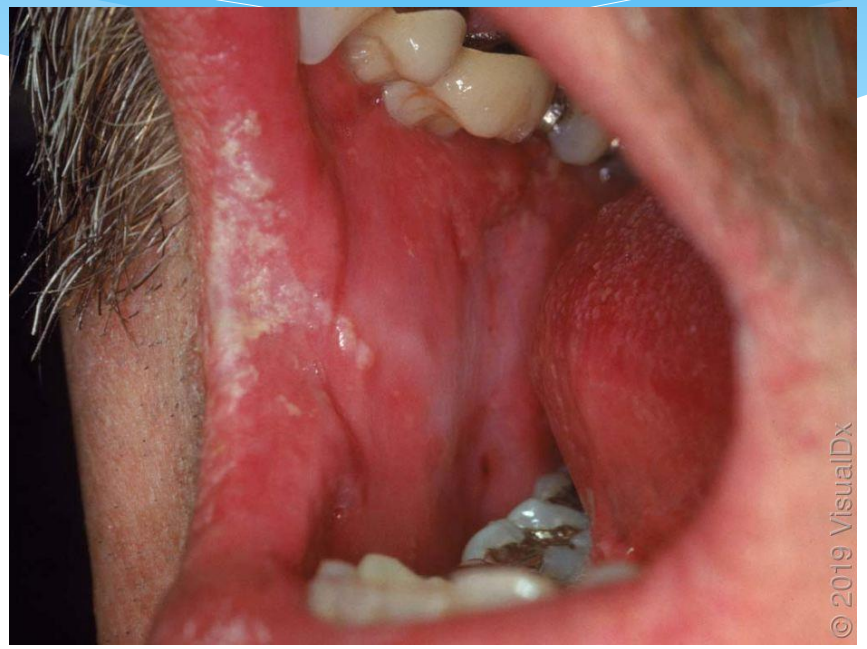
Tinea Versicolor Treatment

* Topical antifungal creams (ketoconazole) for mild localized disease
* Selenium sulfide shampoo
* Single day dosing of either oral ketoconazole, fluconazole, or itraconazole

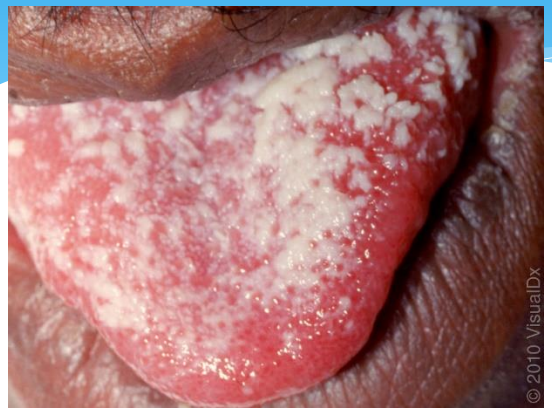


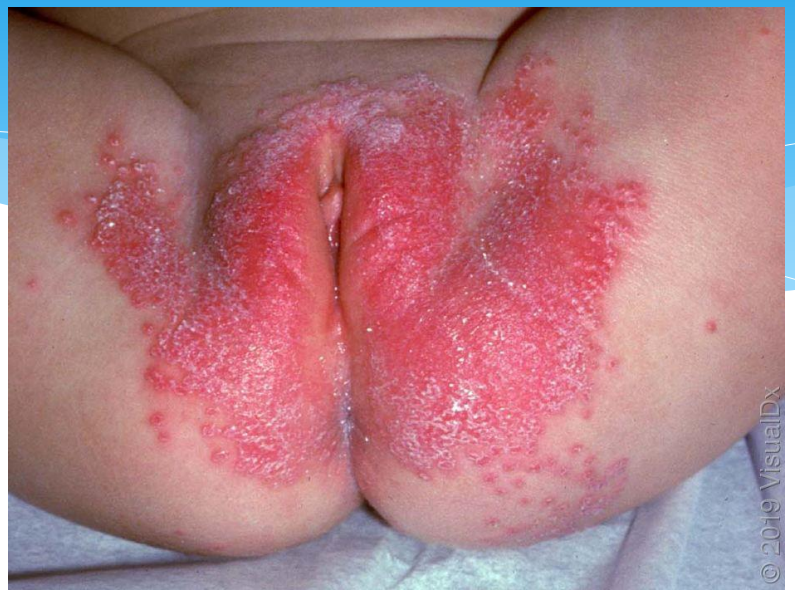
Candidiasis

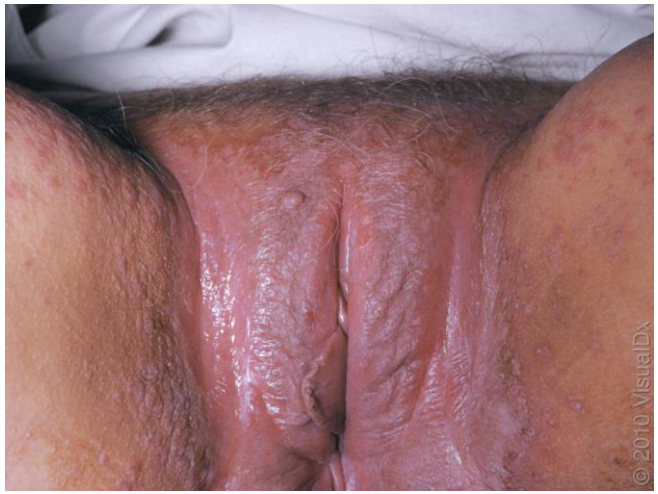
* Creamy, crumbly, whitish exudate
* When removed, leave an underlying erythematous base
* Common in the first weeks of life and there is significant association with vaginal Candida carriage in the mother
* Associated with immunosuppression or ill-fitting dentures



Candidiasis







Candida Treatment

* Topical antifungal creams (clotrimazole, ketoconazole, etc.) for mild localized disease
* Measures to decrease heat and moisture
* Oral fluconazole or itraconazole for more severe disease

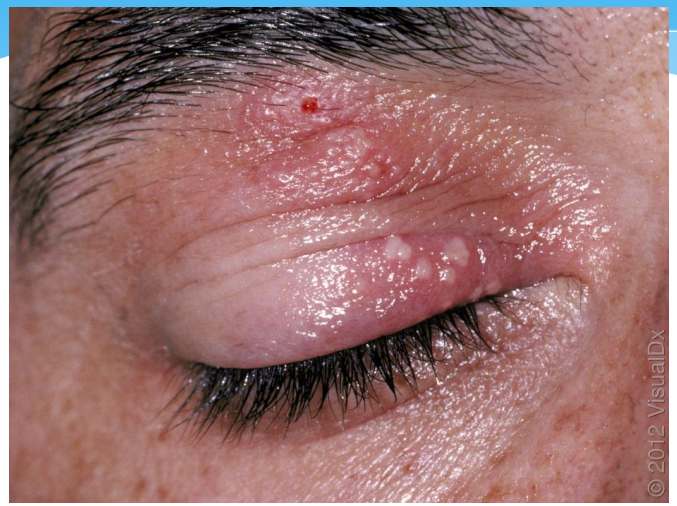
Infectious Disorders:

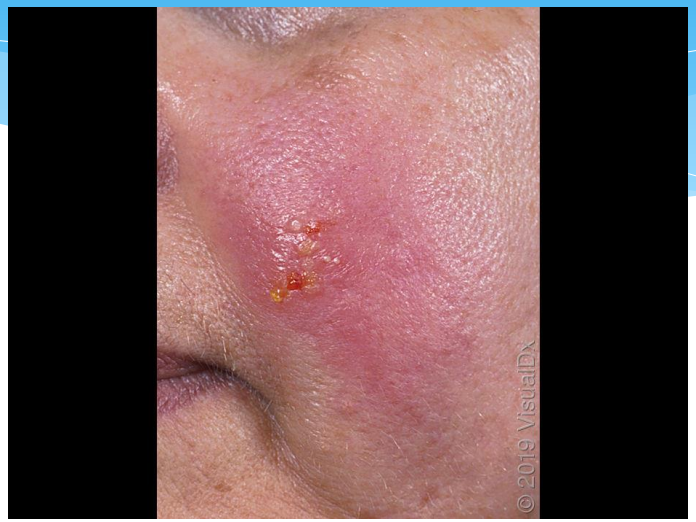
Viruses

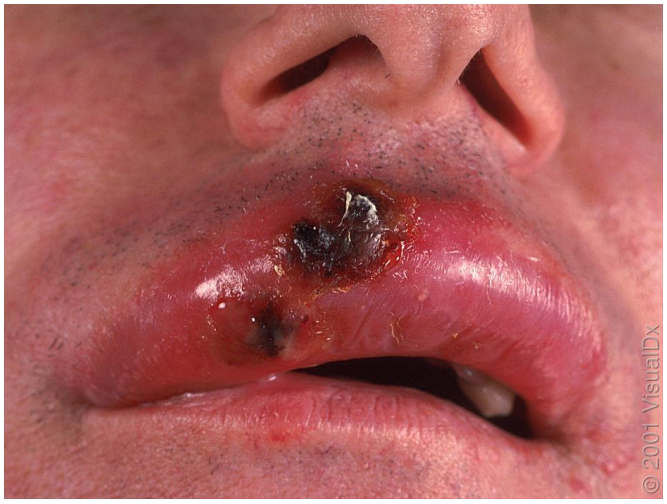
Viral Infections

- Herpes simplex (HSV-1, HSV-2)
- Molluscum contagiosum
- Warts (HPV)
- Herpes zoster (VZV)
- COVID

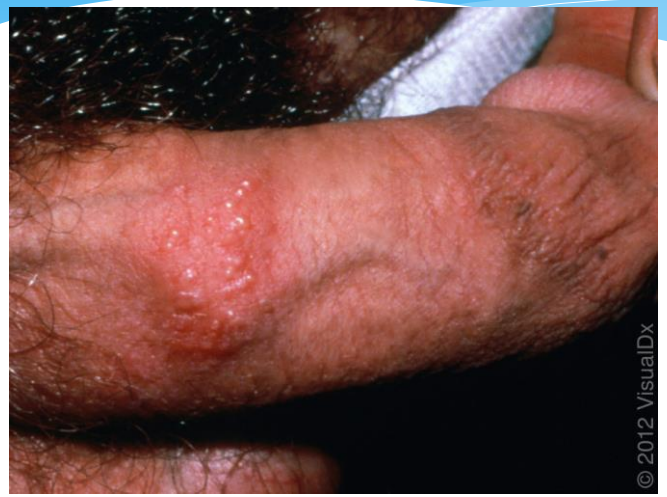
Herpes Simplex I

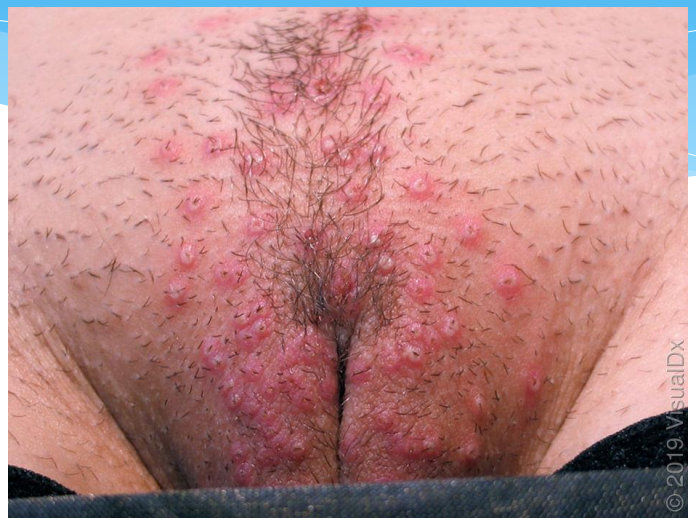


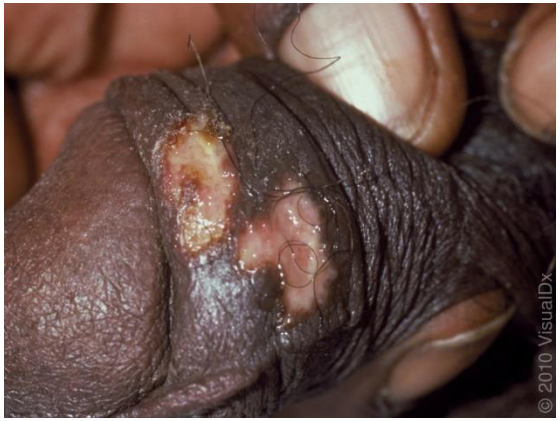




Herpes Simplex II







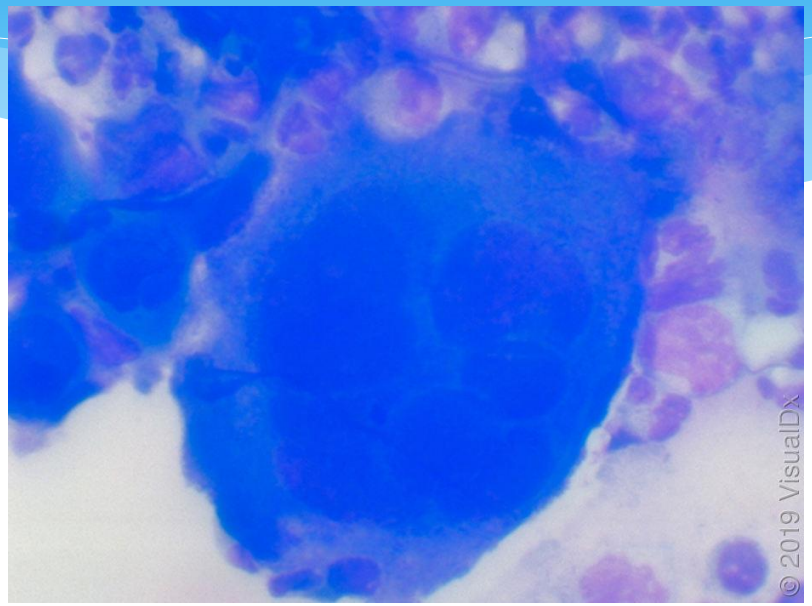
Herpes Simplex Treatment

TEST

* Skin swab PCR HSV
* Tzank smear

TMT CDC 2015 Treatment Guidelines

* Normally resolve 5-10d
* Acyclovir 400 mg po TID for 7-10d or 200mg po 5/day for 7-10d
* Famciclovir 250 mg po TID for 7-10d
* Valacyclovir 1 gm po BID for 7-10 days
* Foscarnet or cidofovir IV for acyclovir-resistant disease



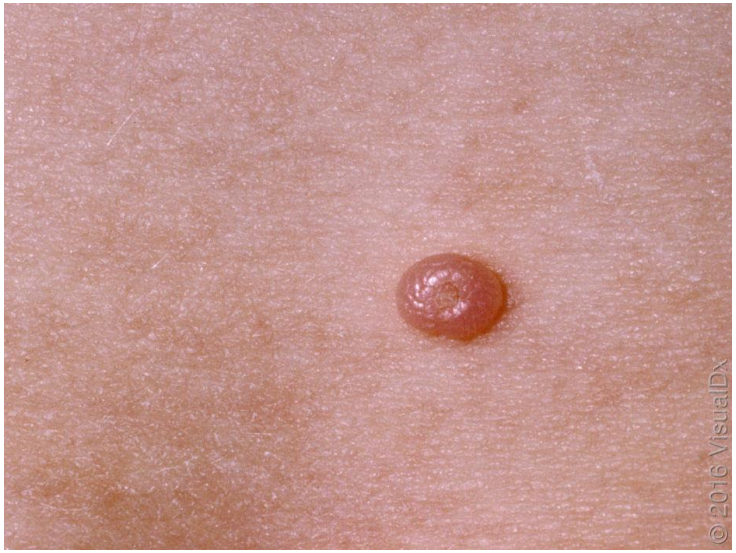
PROPHYLAXIS

* Acyclovir 400 mg po
* Famciclovir 250mg po BID
* Valacyclovir 500mg po qd
* Valacyclovir 1 gm po qd

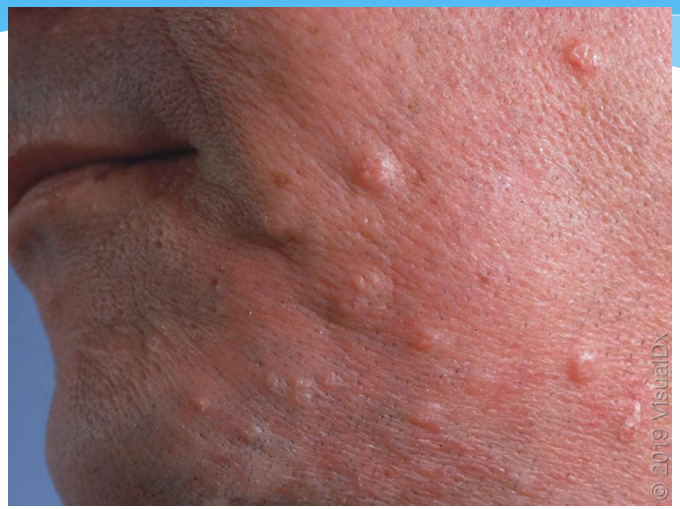
- Symptomatic partners should be treated
- HSV is reportable in some states
- Screen for other STDs

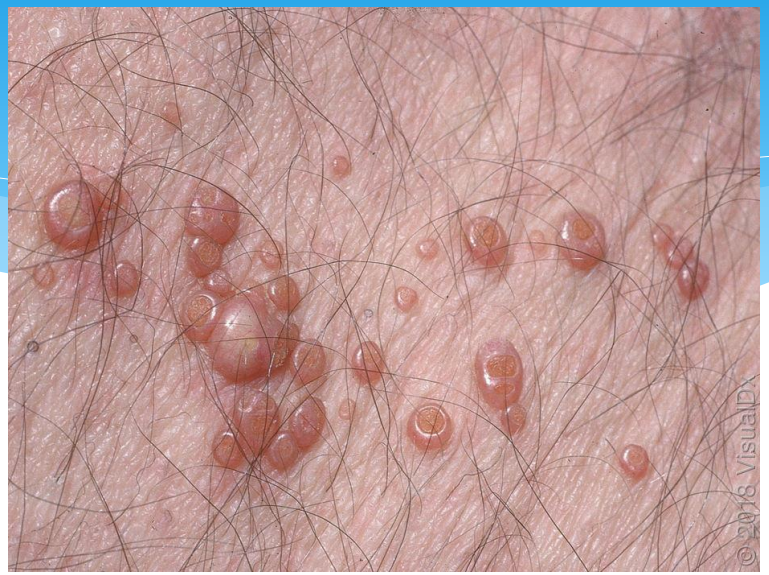
Molluscum Contagiosum

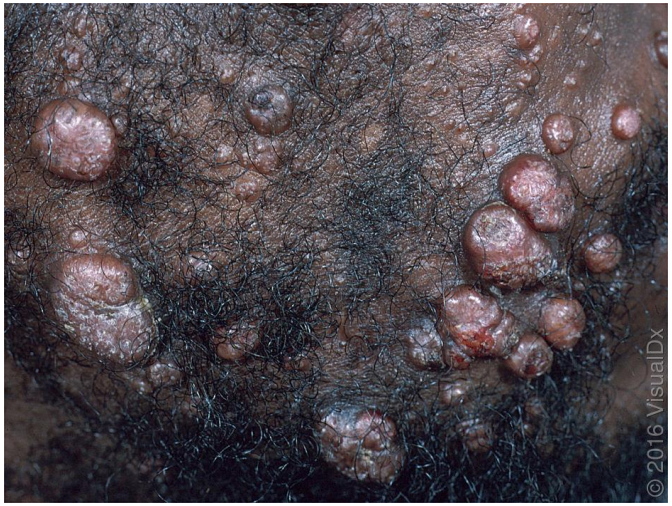
* Discrete flesh-colored umbilicated papules
* Pox virus group
* Children between the ages of 3 and 16, this disorder my appear at any age
* Contagious and auto-inoculable



Molluscum Contagiosum







Molluscum Treatments

TEST

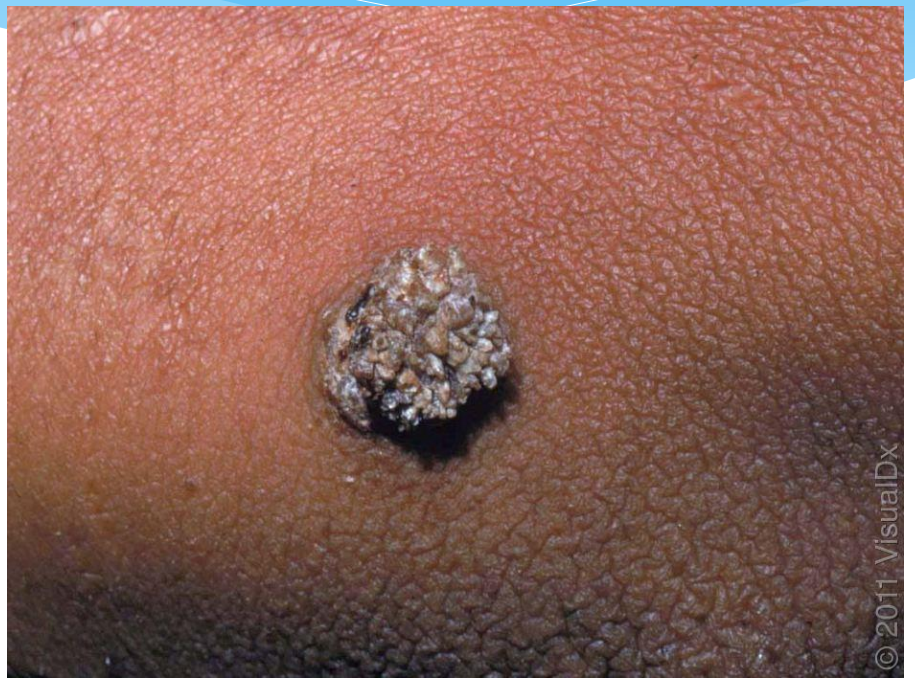
* Clinical dg
* Biopsy: Henderson-Paterson bodies

TMT

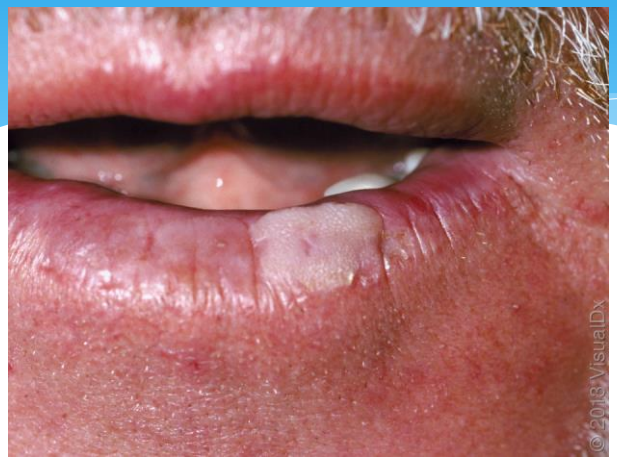
* Liquid nitrogen
* Electrodessication and curettage
* Cantharidin
* Trichloroacetic acid 100%
* Tretinoin
* Imiquimod 5% cream

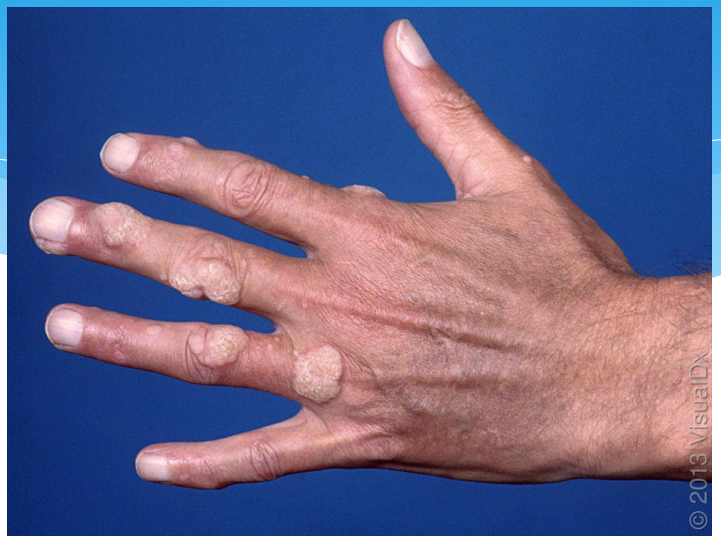
Verucca Vulgaris

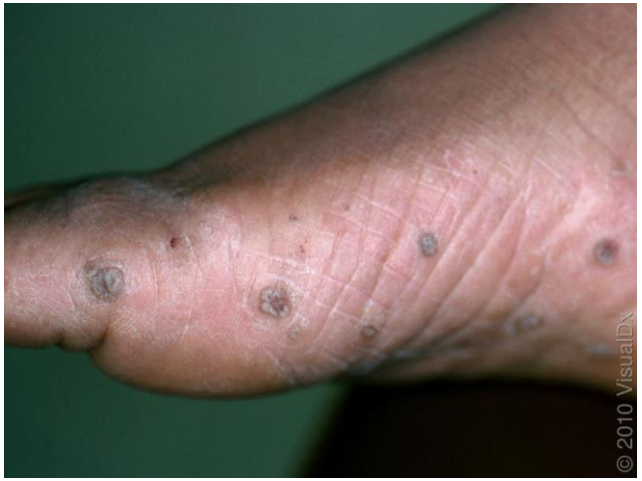
* Papilloma virus
* Round, discrete, skin-colored , pinpoint hemorrhage
* Roughened surface
* Spread by direct or indirect contact
* Primarily seen on feet, hands, and elbows; can occur anywhere

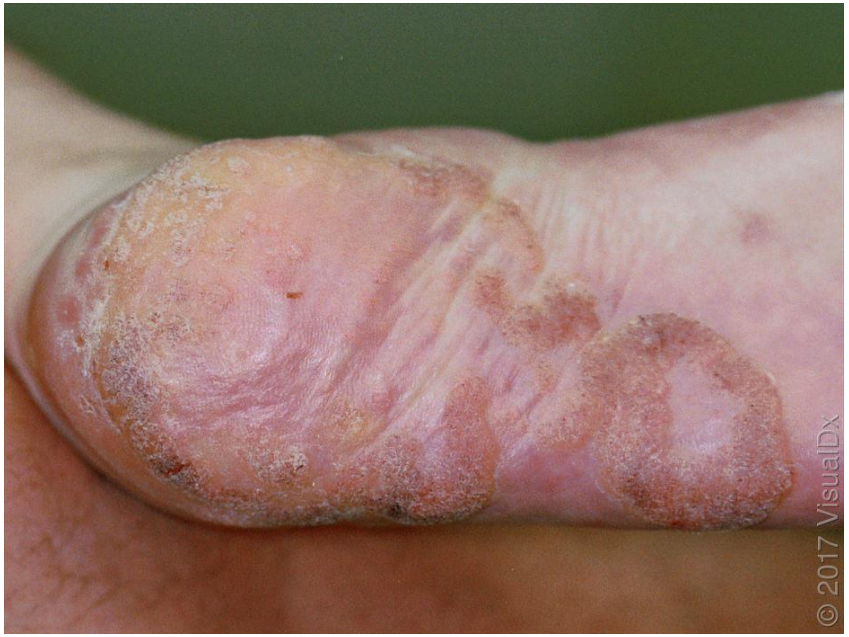


Verruca vulgaris

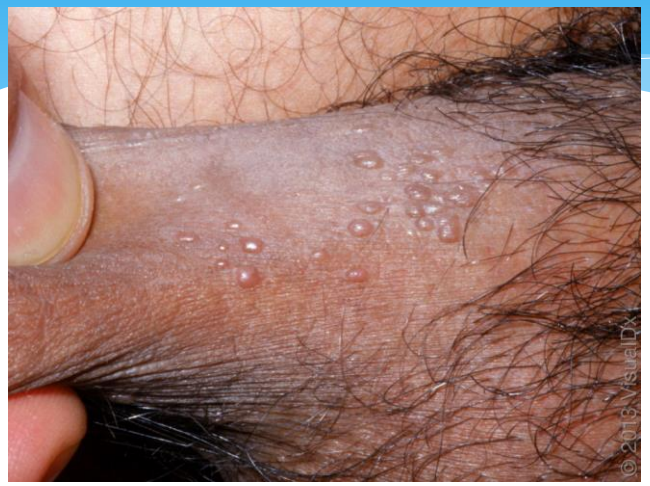


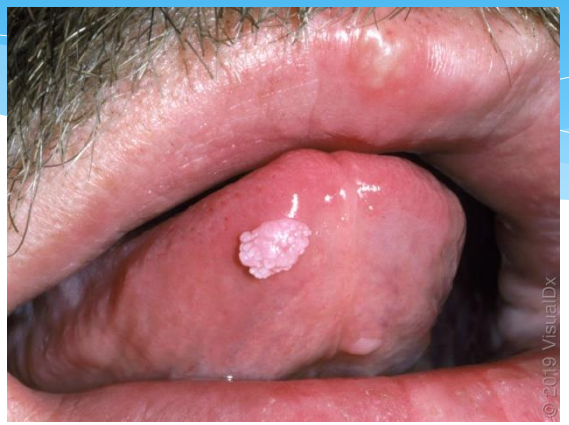


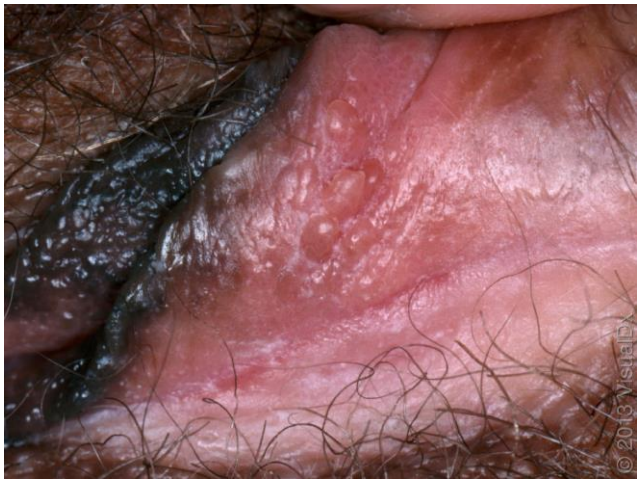


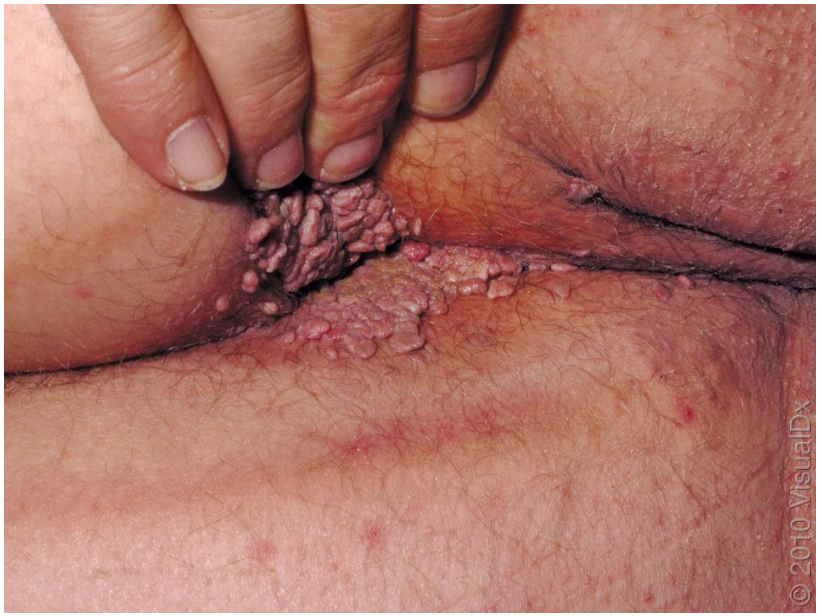


Condyloma acuminata









Wart Treatments

TEST
* Clinical diagnosis
* PAP smear (false-negs can happen)
* Acetic acid to whiten lesions

TMT
* Podophyllotoxin
* Imiquimod 5%
* Sinecatechins 10% oint TID x 16W
* Efudex 5% cream BID 2-4W
* Cidofovir 1% gel qd
* Retinoids
* Sodium nitrite 6% with citric acid 9% BID
* Liquid nitrogen
* Trichloroacetic acid
* Surgical excision
* Laser
* PPD inj
* Bleomycin

COUNSELING
- May grow rapidly in pregnancy and immunosuppression.
- Smoking cessation counseling.
- Condom use
- STD screening

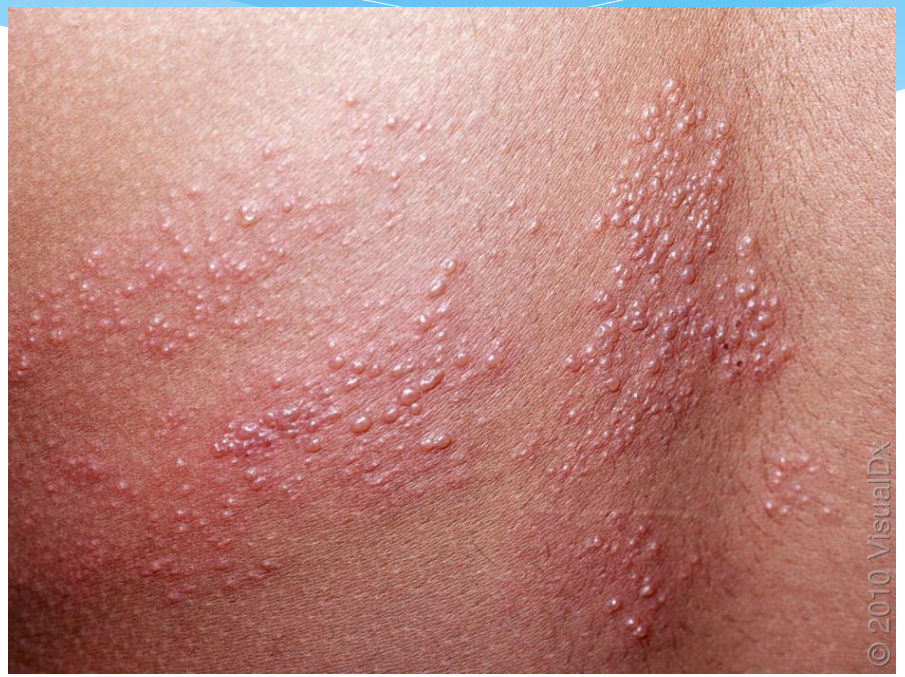
VACCINATION
- 9-valent HPV
- 2-dose schedule for boys/girls for ages 9-14
- 3-dose schedule for ages 15-26
- Approved for those 27-45
- HIV: 3-dose vaccine regardless of age

Herpes Zoster

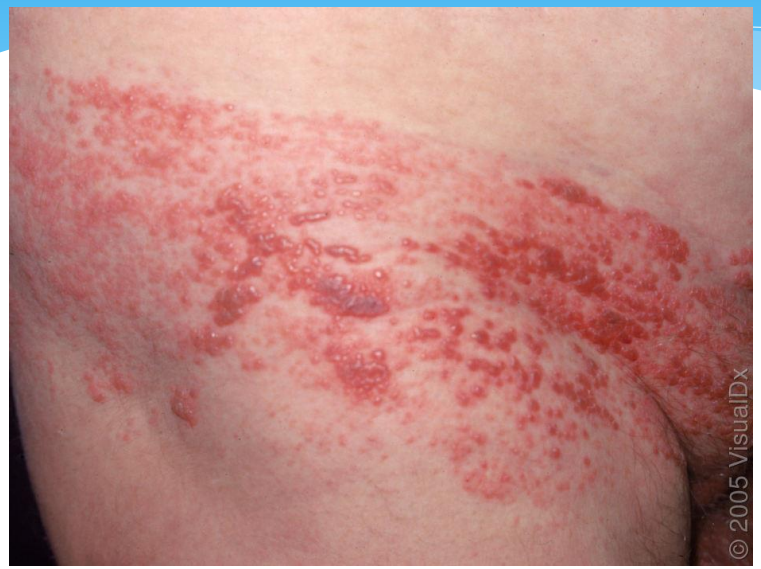
* "Shingles"
* Painful and pruritic
* Dermatomal pattern
* Exposure to HSV, varicella

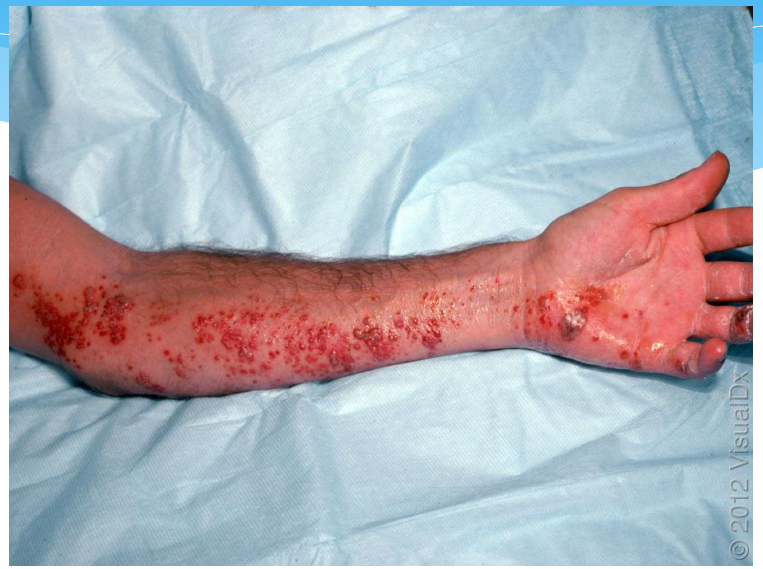
TMT:

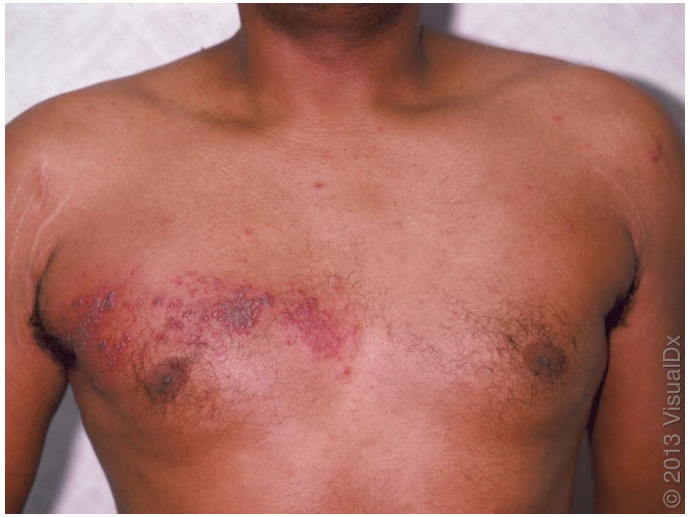
* Can treat with anti-virals but mostly supportive therapy



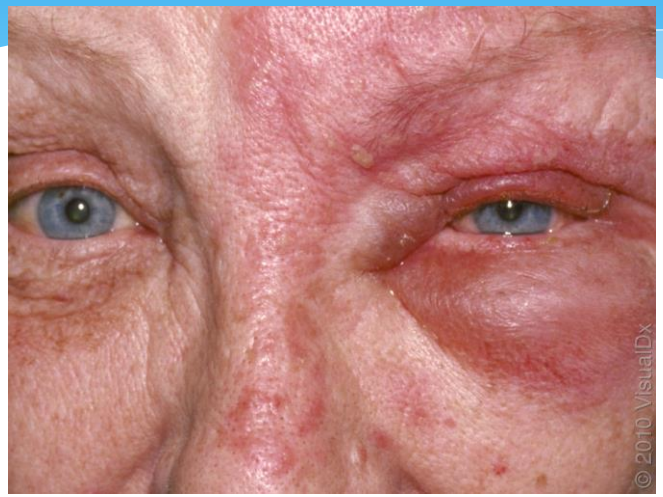
Herpes Zoster

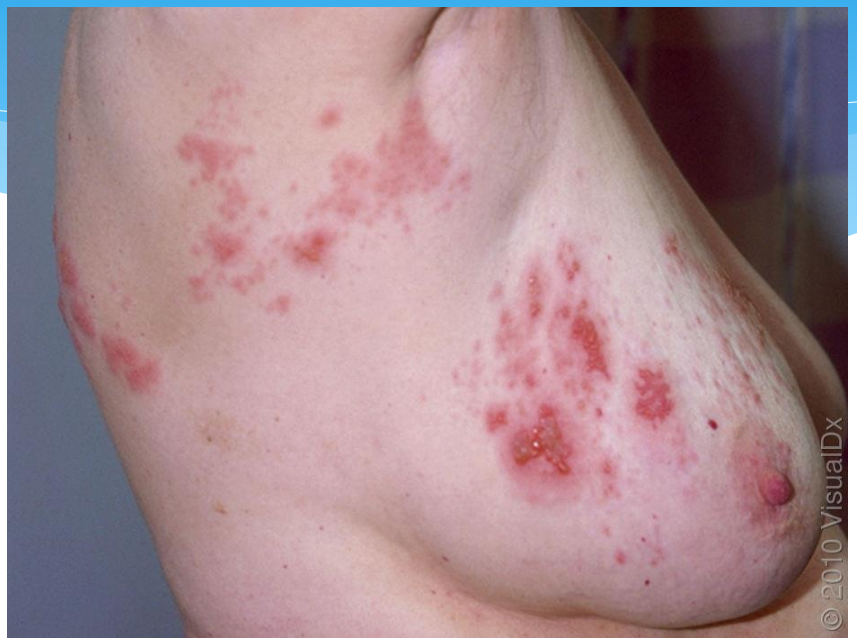


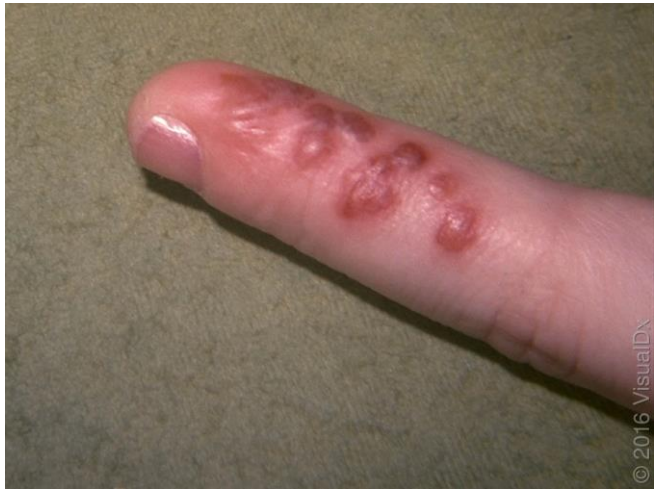




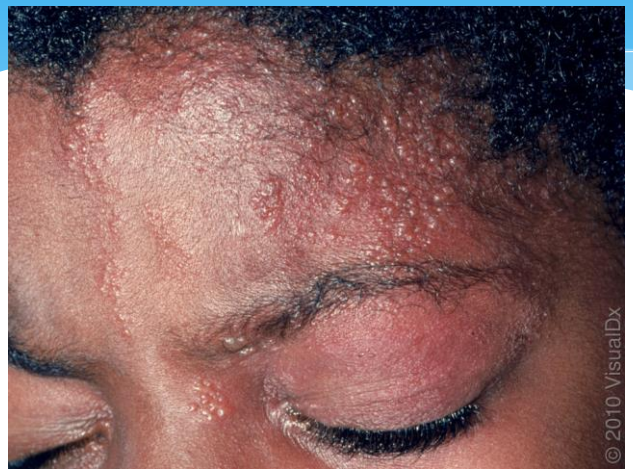
Herpes Zoster

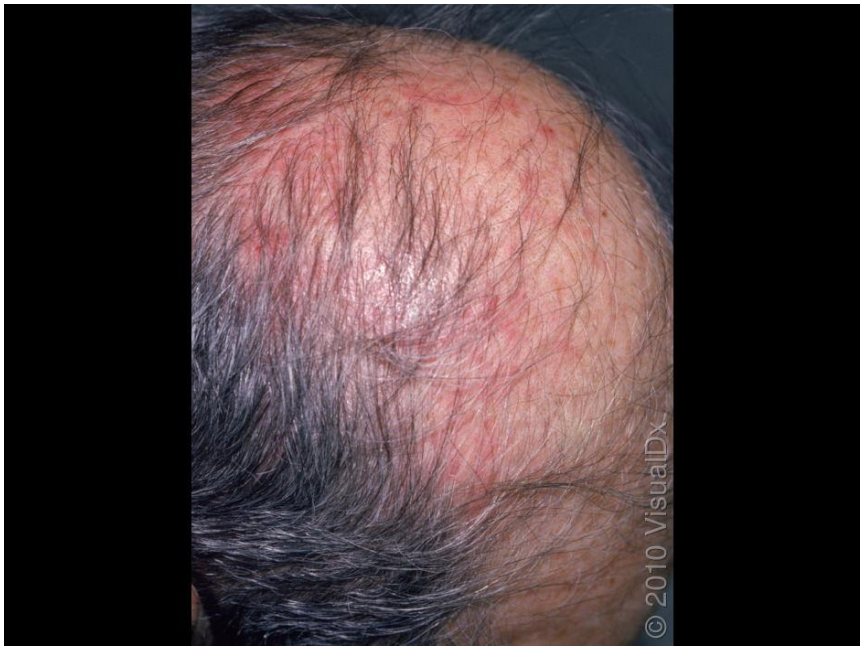






Herpes Zoster





Herpes Zoster Treatment

TEST

* Tzank
* Culture PCR

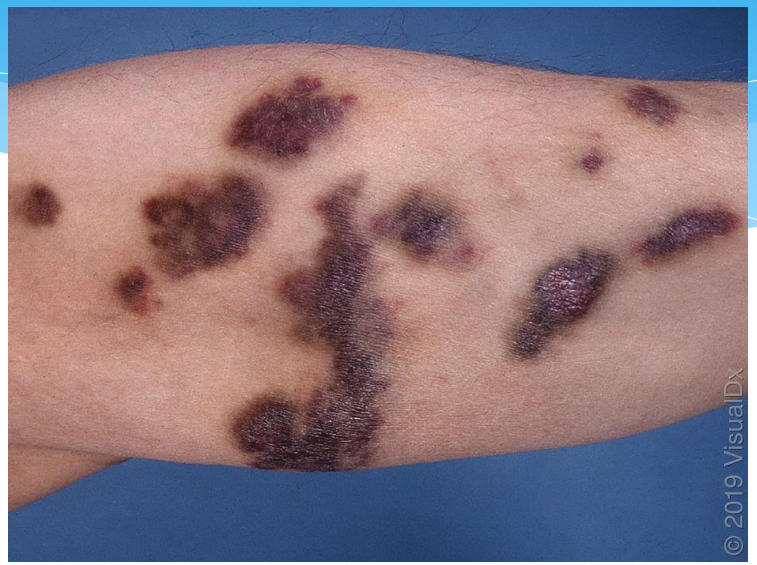
TMT

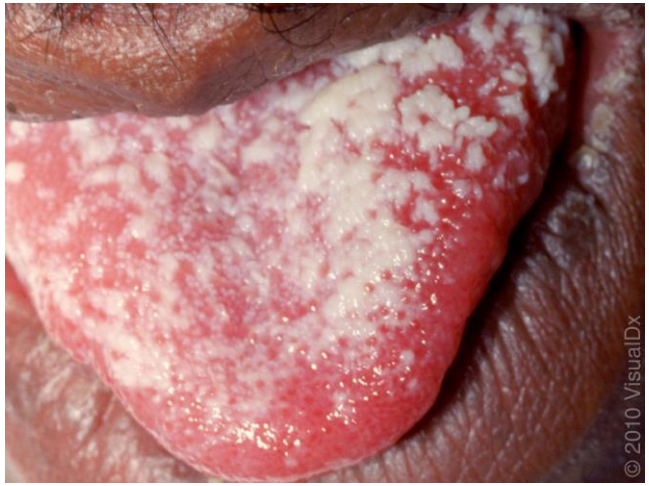
* Acyclovir 800 mg po 5x/day
* Famciclovir 500 mg po TID or Valacyclovir 1 g po TID for 7 days
* Acyclovir 10 mg/kg IV q 8 hours for ophthalmic zoster
* Burow's soaks, NSAIS, opioids
* Amitriptyline 25mg qd to help with pain with acyclovir

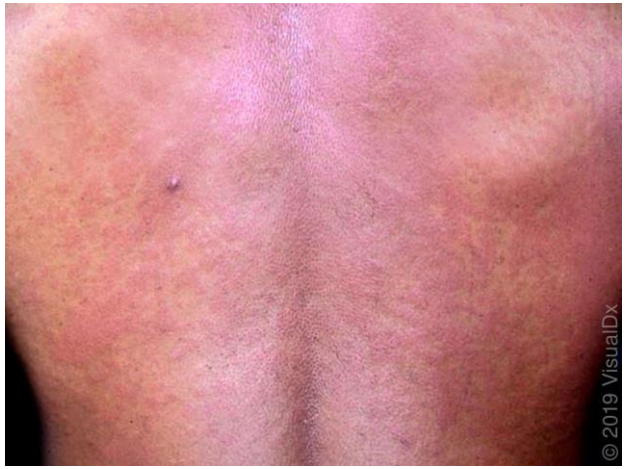
Eye and ear involvement are emergencies!

HIV-related Infections

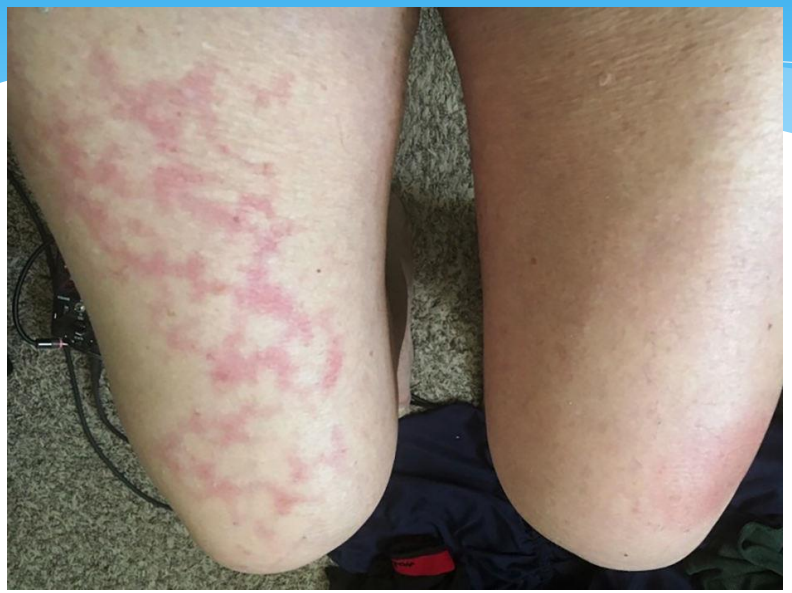
* Condyloma (warts)
* HSV
* Dermatophyte
* Candidiasis
* Kaposi's sarcoma

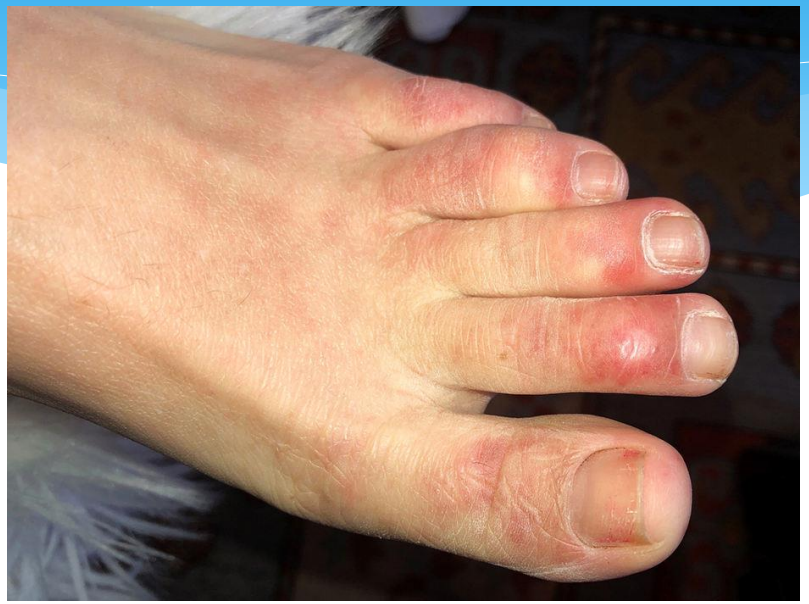


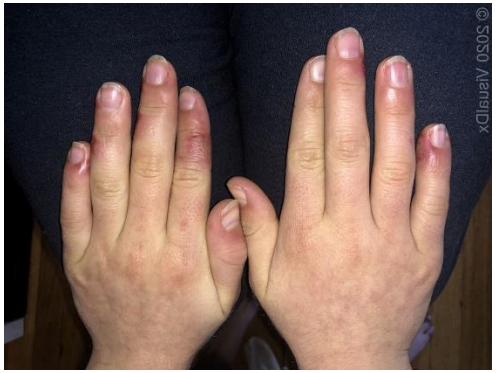


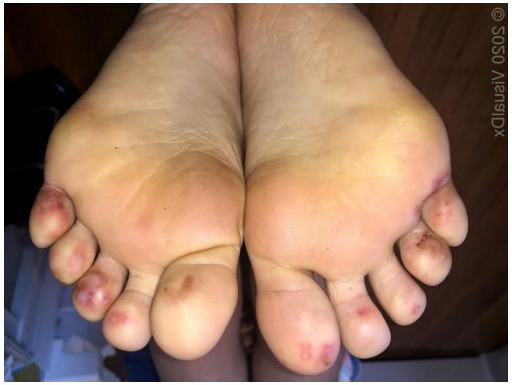


COVID-19

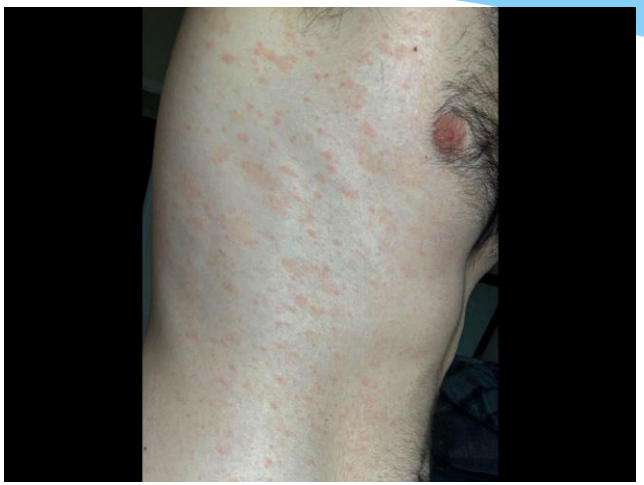


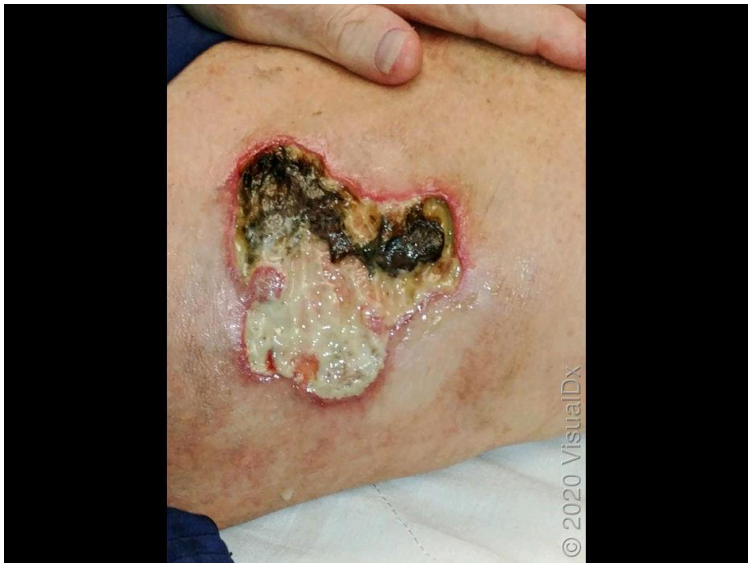






COVID-19





COVID-19 Cutaneous Findings

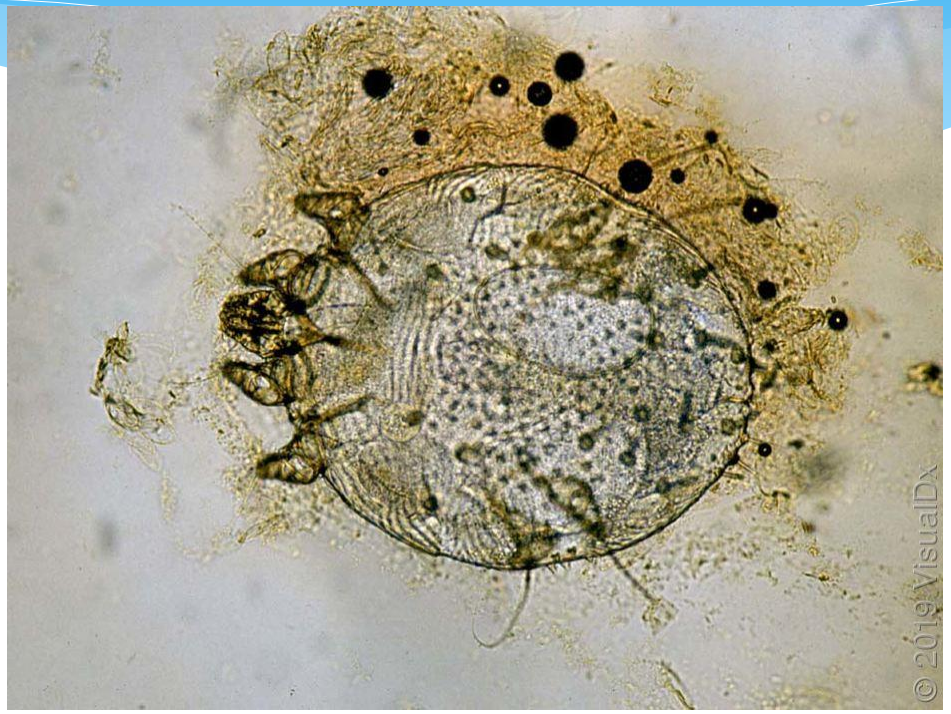
* Not common
* Most common include:
  * Pernio-like (chilblains) lesions on toes (COVID toes), fingers, hands and feet: younger patients
  * Chickenpox-like rash: middle-aged patients
  * Urticarial (hives)
  * Papulosquamous eruption
  * Livedo or retiform purpura
  * Mucositis

Parasitic Infections

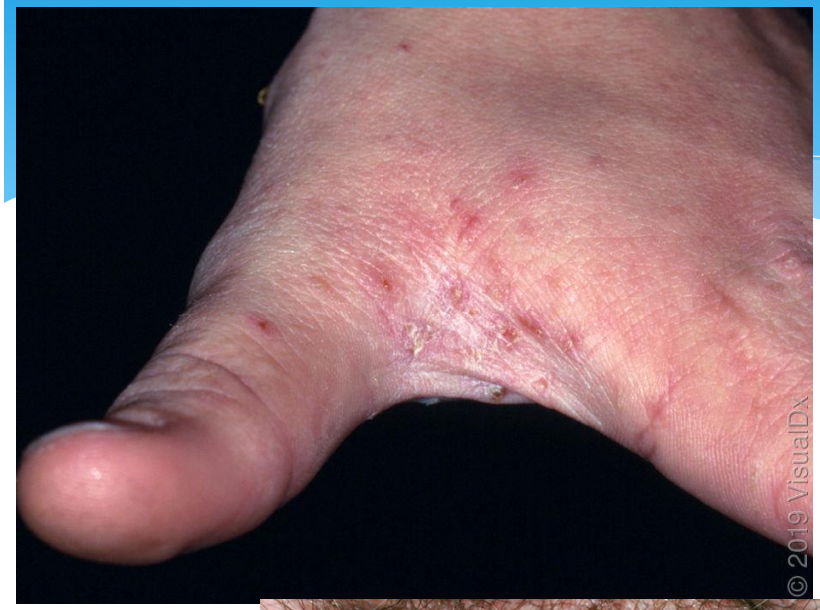
Scabies
Lice
Arthropod bites
Bedbugs
Lyme Disease

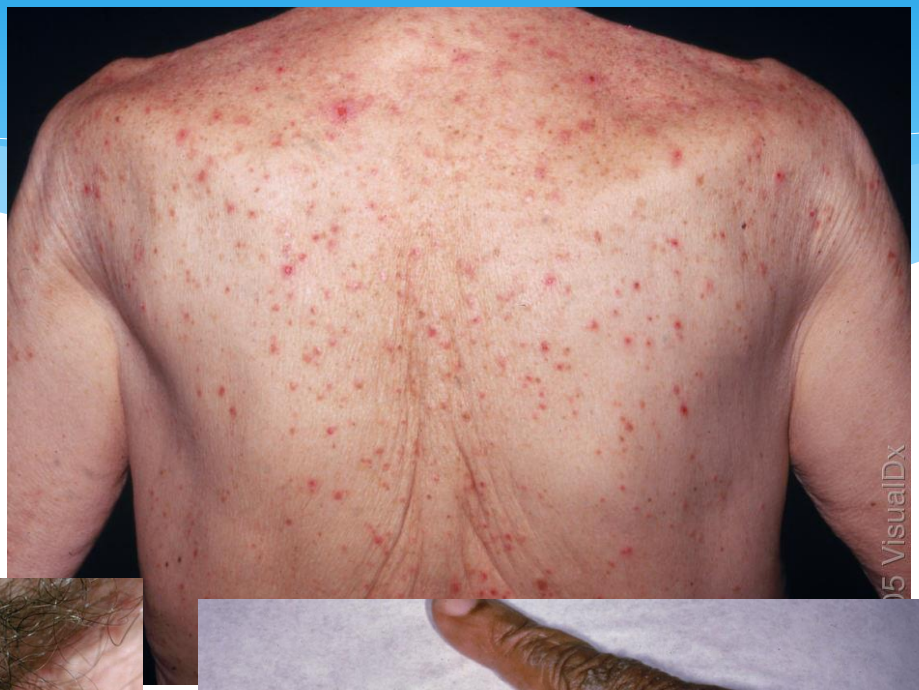
Scabies

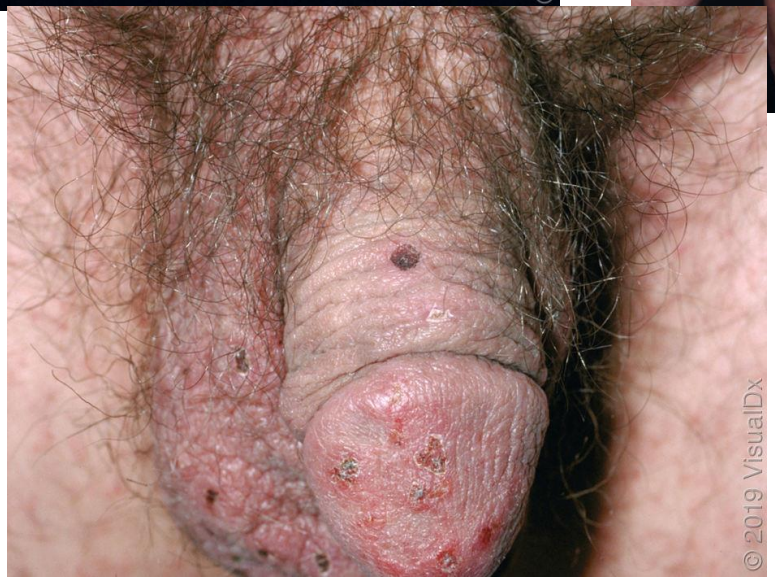
* Finger webspace involvement
* Linear burrows
* Severe pruritis
* Difficult to get positive scraping
* Need to treat household contacts

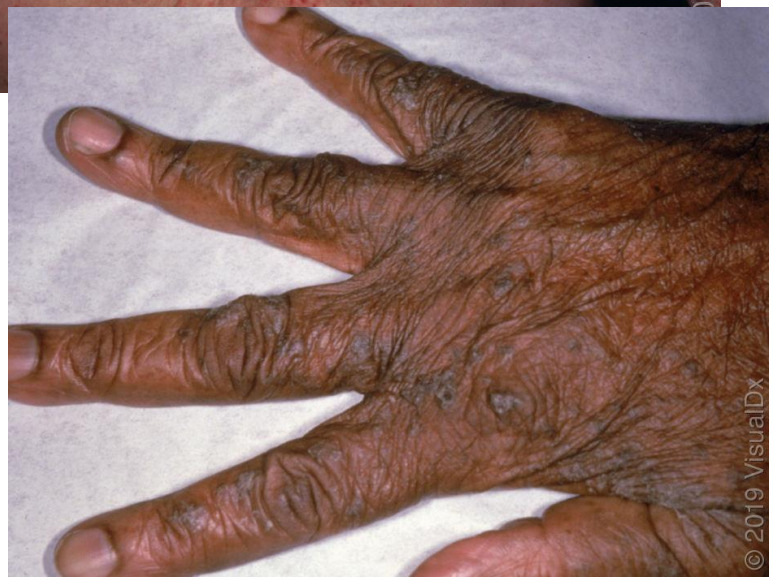


Scabies

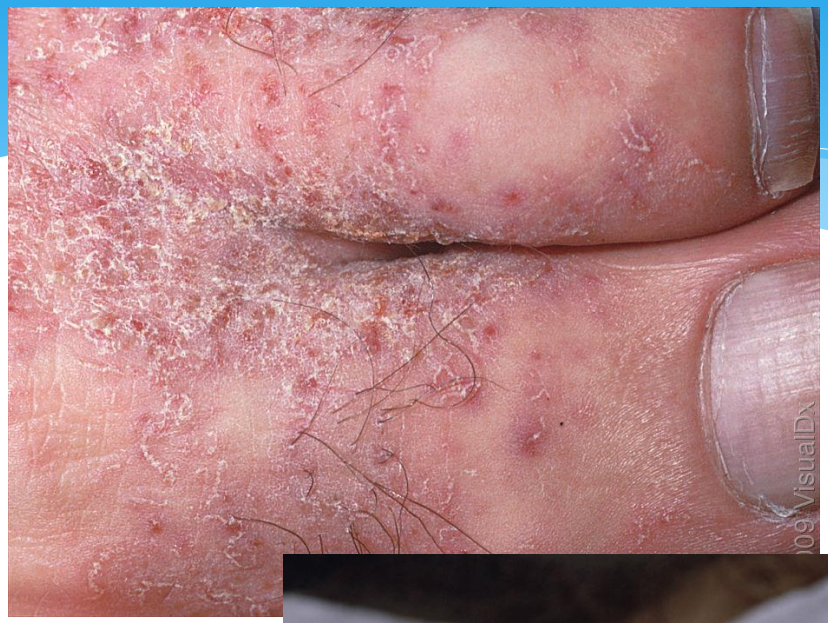


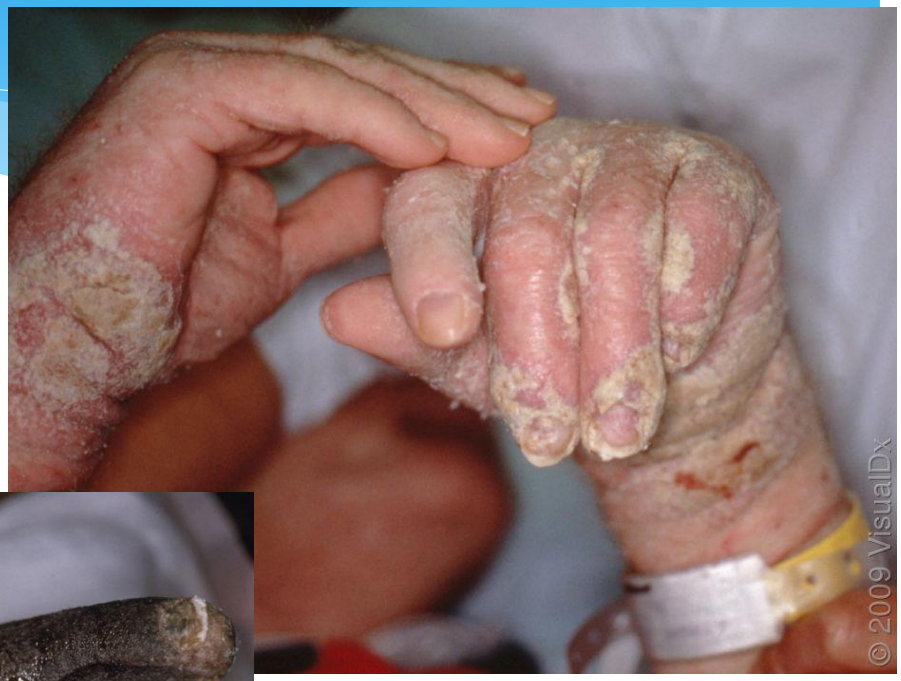


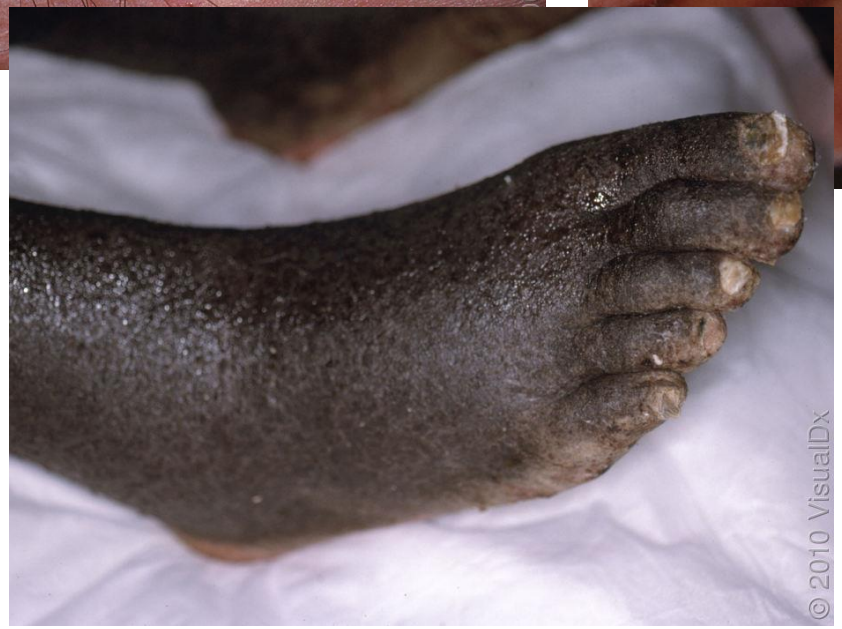




Norwegian Scabies







Scabies Treatment

TEST

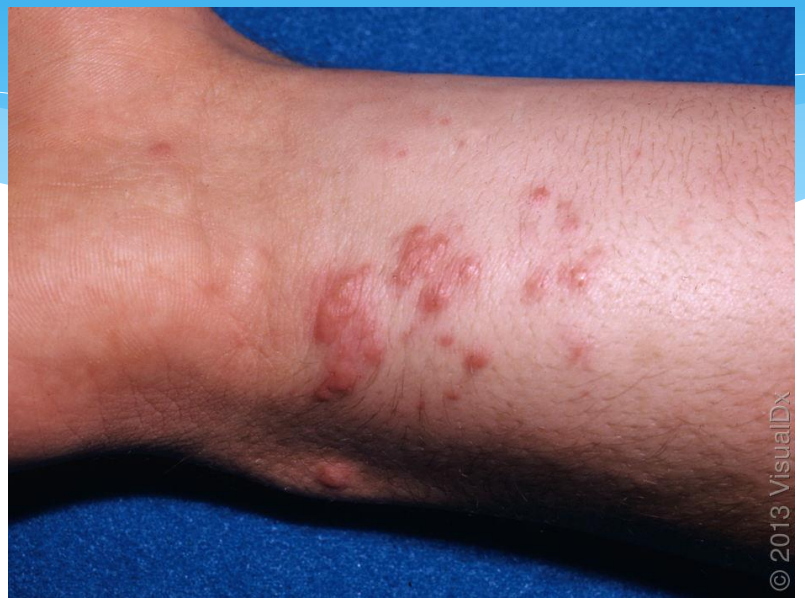
* Skin scraping

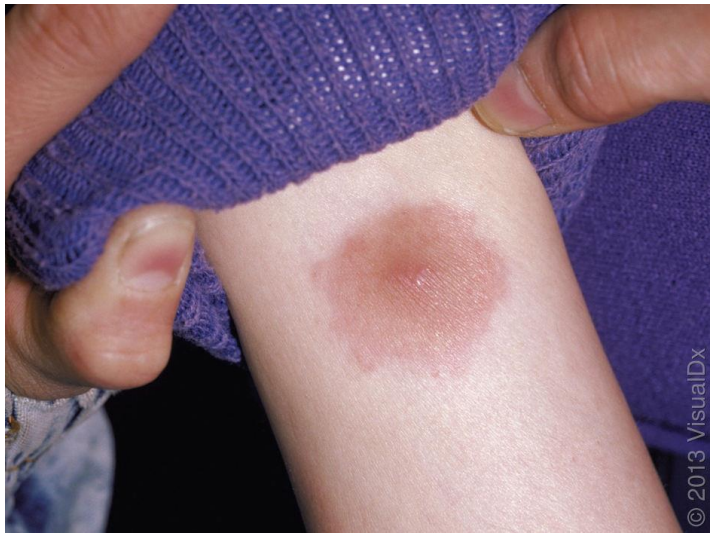
TMT

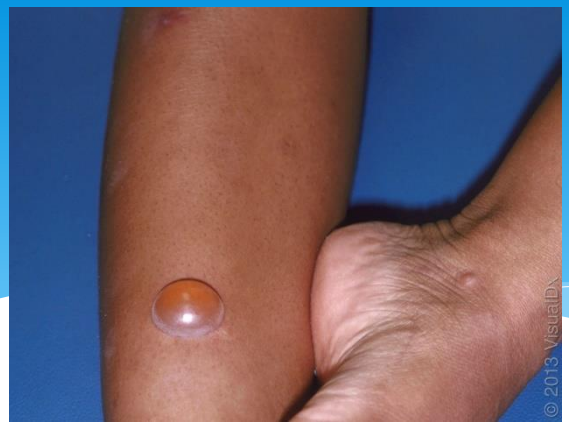
* Permethrin 5%cream total body application at night, then repeat in 1 week (q2-3d for severe infestation)
* Lindane (may cause toxicity) 1% lotion/cream from neck down; wash off in 8 hours
* Benzyl benzoate 10-12.5% in kids, 25% in adults (can cause sig irritation)
* Wash all bed clothes and sheets the following morning
* Treat all household members on the same nights
* Ivermectin 200ug/kg po; repeat in weeks.
  * Severe cases: 200-400 ug/kg po days 1,2,8,9 and 15; repeat on days 22 and 29
* Oral antihistamines and topical steroids for pruritus

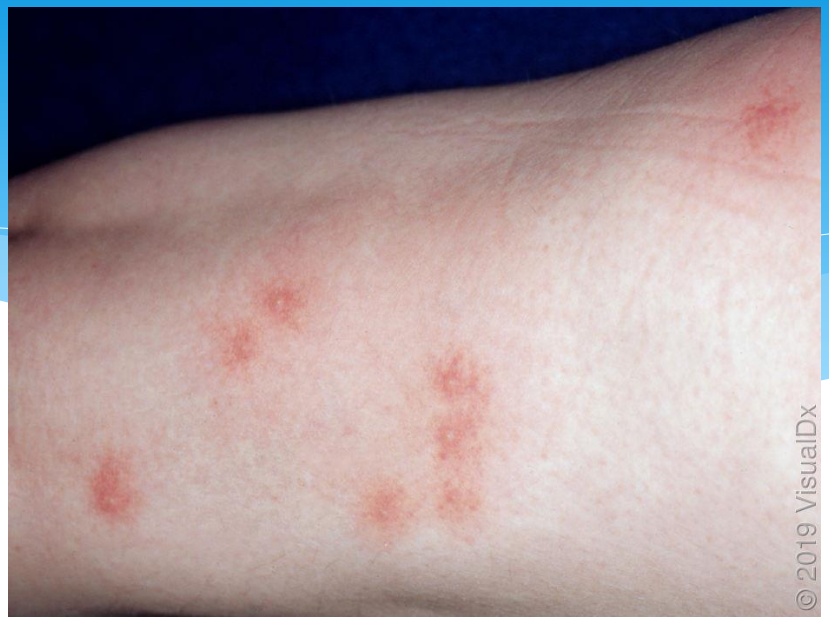
Arthropod bites

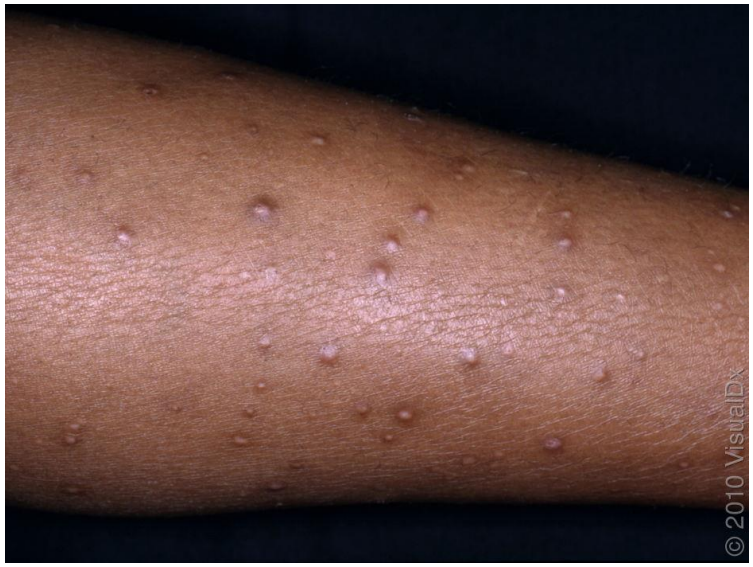
* Erythematous papules that can become vesicles, ulcers and even necrotize
* Breakfast-lunch-dinner
* Think about topical tmt as well as systemic

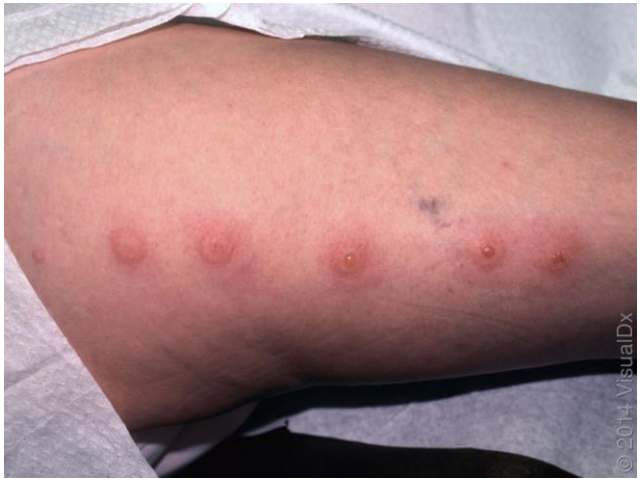






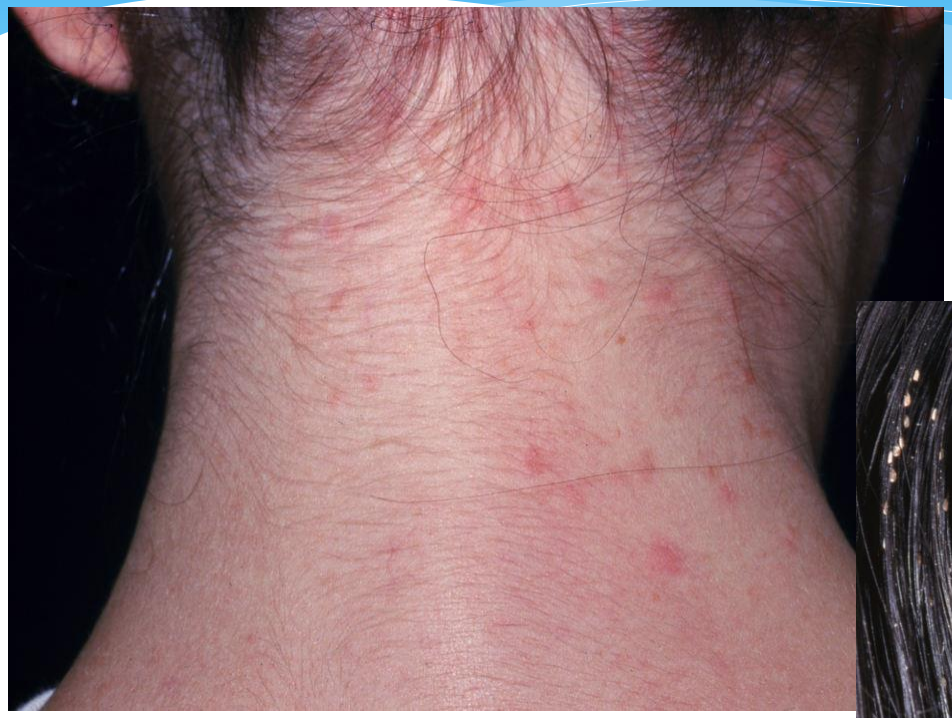


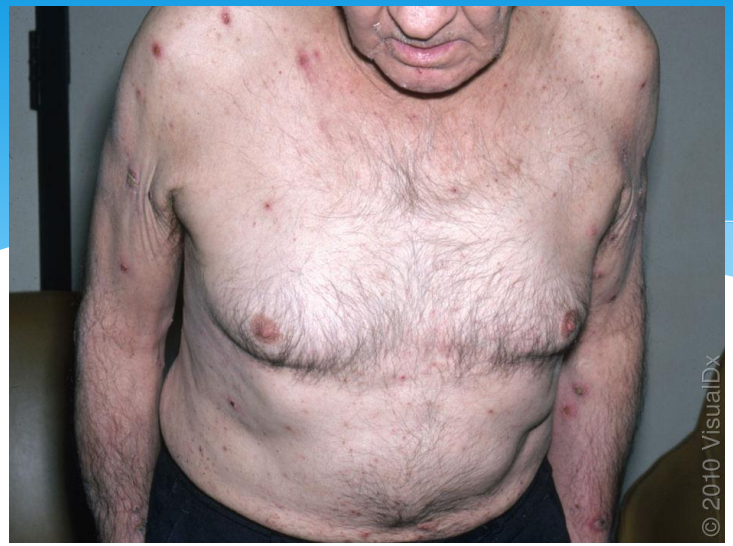


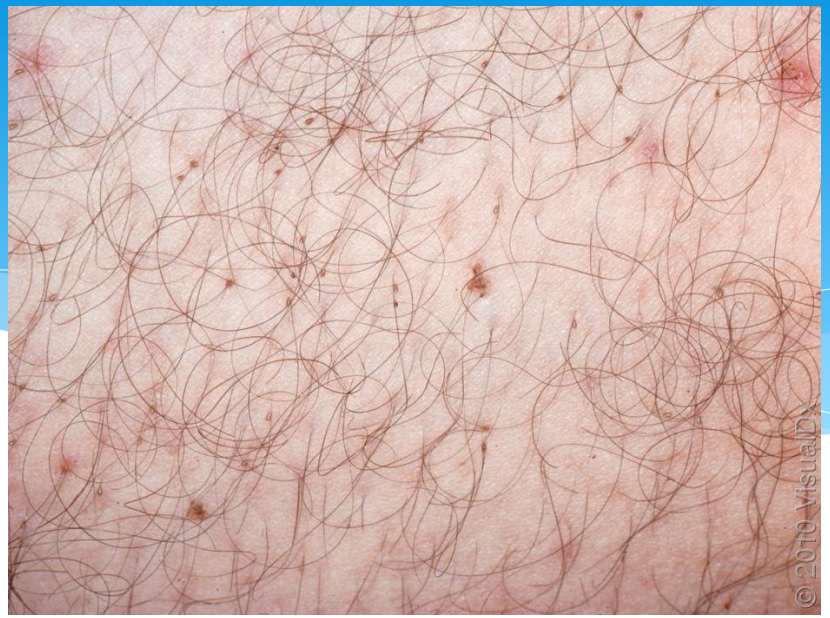


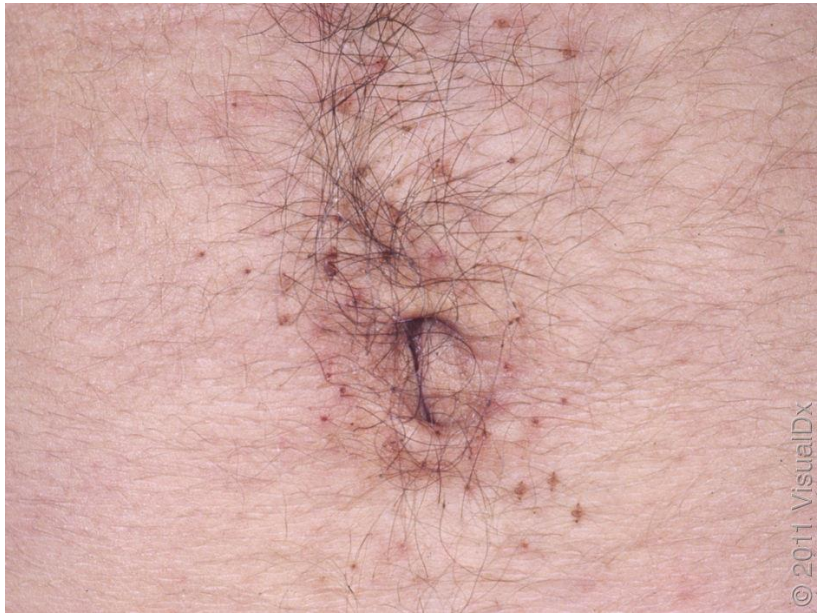
Lice

Lice









Lice Treatment

OTC: Re-treat between 8-10 days (high resistance)

* Permethrin 1% (Nix): Apply to dry hair, and rinse after 10 mins
* Pyrethrins with piperonyl butoxide (RID, Pronto): Apply to dry hair, and rinse after 10 mins
* Ivermectin 0.5% lotion (Sklice): Apply for 10 mins to dry hair; approved for ages 6 months and older.

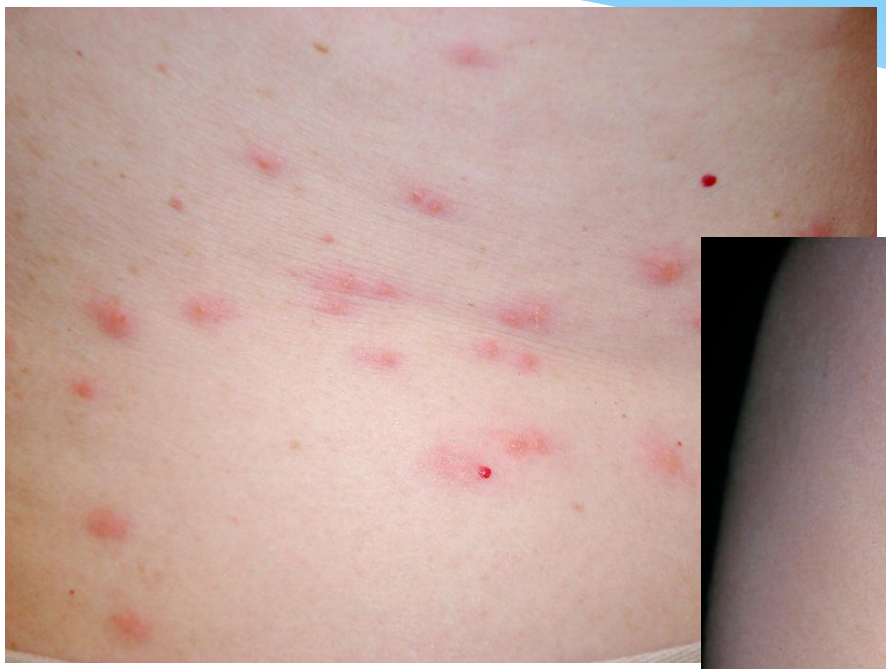
RX:

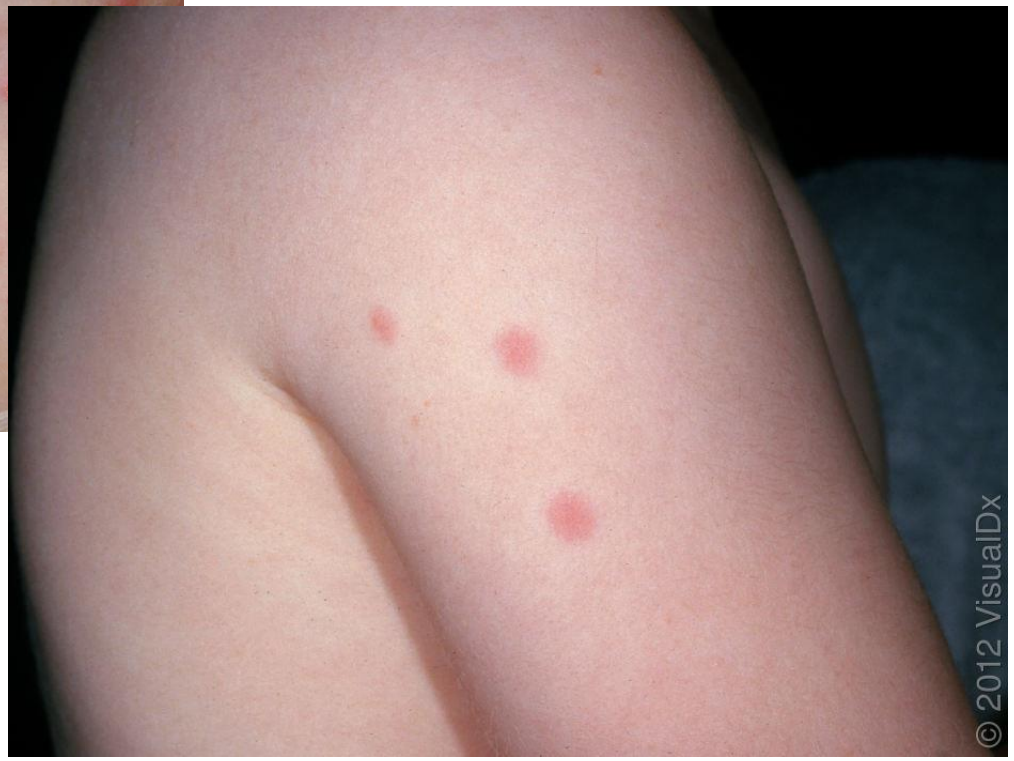
* Permethrin 5% (Elimite) (off-label use): Apply to dry hair, and rinse after 8-12 hrs. Approved for ages 2 months and older.
* Malathion 0.5% lotion or gel (Ovide): Apply to dry hair, and rinse after 8-12 hrs (although 20-min appl may be effective). Resistance noted in Europe but no known resistance in United States. Approved for ages 6 years and older.
* Spinosad 0.9% cream rinse: Apply for 10 mins to dry hair; no known resistance; approved for ages 4 yrs and older.
* Benzyl alcohol 5% (Ulesfia): Apply for 10 mins; no resistance known; approved for ages 6 months and older.
* Oral ivermectin (off label for cases resistant to topical therapy): 200-400 micrograms/kg on DAYS 1 and 8. Not indicated for children who weigh less than 33 pounds or women who are pregnant or breastfeeding.
* Lindane, dichlorodiphenyltrichloroethane (DDT), and carbaryl: Use of these products is rarely recommended due to potential systemic toxicity and limited effectiveness

OTHER:

* Mechanical removal: repeat qW x 3 weeks
* Treat entire house

Bedbug Bites





Bed Bugs

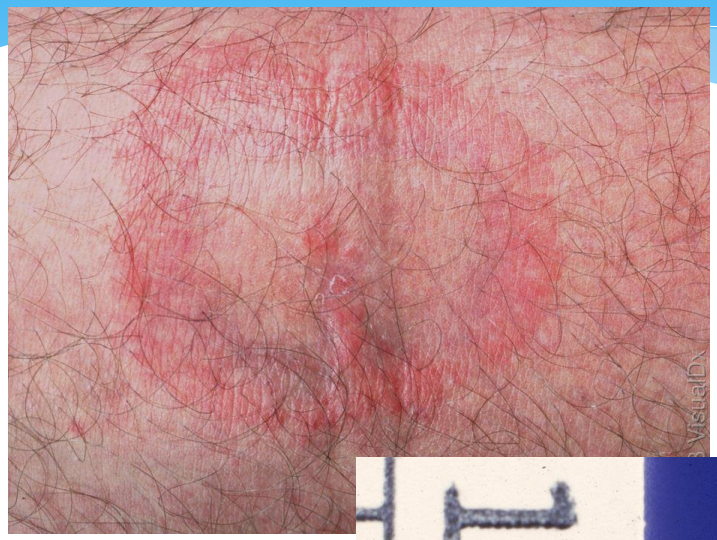
Bedbugs

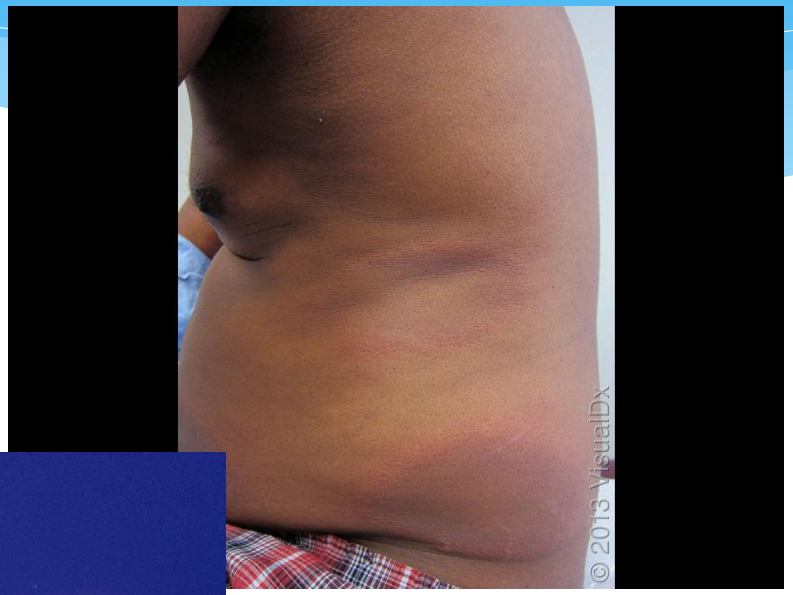
* Face, neck, arms and hands (rare on trunk)

* Wash with soap and water
* Topical steroid
* Antihistamines

Bites will resolve on their own in 1-2 weeks

Lyme Disease





Lyme Disease

* Erythema migrans
* Borrelia burgdorferi
* Primarily in New England and Midwest and West Coast states
* Mice and deer animal reservoirs

TEST:

* *B burgdorferi* C6 peptide antibody assay best first test
* CDC:
  * 1st: enzyme immunoassay (EIA); if pos then Western blot

TMT: (CHECK YOUR LOCAL CDC SITE)

* Doxy 200mg within 72 hours of tick bite
* Doxy, amox, cefuroxime, azithro, clarithro, erthro

Objectives Revisited

* Identify 3 common bacterial infections, their clinical presentations and treatments
* Identify 3 common presentations of fungal and candida infections and treatments
* Identify 3 common viral infections and their clinical presentations and treatments
* Identify 3 common parasitic infections and their clinical presentations and treatments

Thank you!

(FINALLY)