Dermatology Team 441

MED441
KING SAUD UNIVERSITY

BH
Bassam Alhubaysh
REVIEWED BY

Common skin infections

Objectives:

- To overview for the main types of skin infections.
- To know the common causes of skin infections in each type.
- To know the clinical features of each disease.
- To get the management outlines of each disease.

Please note that the written content of this lecture is based on lecturer's notes, previous years' content and/or AMBOSS; as the slides contained only pictures.

Color index:

- Main text
- Important
- Dr's explanation
- Golden notes
- Extra

DERMATOLOGY TEAM 438

This lecture was originally done by both 438 & 439 teams.
So great thanks to them

Common Skin Infections: Bacterial

Types of infections:

1- BACTERIAL INFECTIONS.
2- VIRAL INFECTIONS.
3- FUNGAL INFECTIONS
4- PARASITIC INFECTIONS

1-bacterial infections

Impetigo

Epidemiology

- **Primarily affects children** (especially between 2–6 years of age).
- Impetigo is **highly contagious** and can cause epidemics in preschools or schools.
- **Impetigo is the most common bacterial skin infection among children**

Etiology

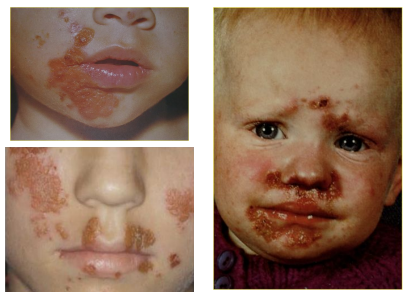
- **Staphylococcus aureus (>90%) (Most common)** > both bullous impetigo and nonbullous impetigo.
- **Streptococcus pyogenes > causes nonbullous impetigo only.**

Clinical features

"Know the descriptive term as they may come in the exam"

Nonbullous impetigo (70%):

- **Papules**, which **turn into small vesicles surrounded by erythema** and/or **pustules**.
- Negative Nikolsky sign.
- **Distribution**:
  - Face (most common), especially around the nose and mouth.

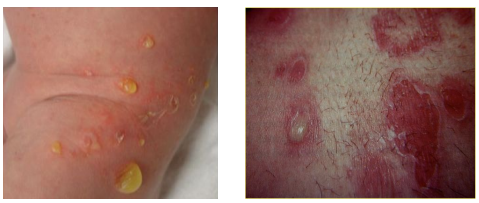


Honeycomb appearance

Perioral perinasal crusted honey colored papules.

Bullous impetigo (30%):

- **Vesicles that grow to form large, flaccid bullae**, which go on to rupture and form thin, brown crusts.
- Positive Nikolsky sign
- **Distribution**:
  - Trunk and upper extremities



Diagnosis

Generally diagnosed based on clinical presentation
DDx: Chronic bullous disease of childhood (in first 1-2 months of disease) especially if there was no response to Abx

Treatment

- **Wound care**
- **Topical antibiotics (mupirocin).**

If the patient has Fever, constitutional symptoms or is immunocompromised; give oral antibiotics: **Amoxicillin, Cephalosporin.**
If **MRSA infection**; clindamycin, **trimethoprim-sulfamethoxazole**, doxycycline

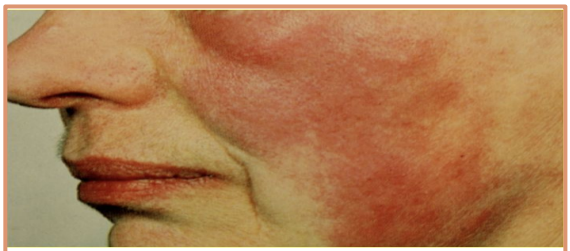
Common Skin Infections: Bacterial (Cont.)

Cellulitis & Erysipelas

Definitions	• **Erysipelas:** superficial skin infection involving the upper dermis. • **Cellulitis:** local infection of the deep dermis and subcutaneous tissue.
Etiology	• **Streptococcus pyogenes (Group A Streptococcus) (Most common)** • Less commonly: Staphylococcus aureus. H.Influenza could possibly cause it in children (but less common than strep) In both erysipelas and cellulitis, the most common point of entry for the pathogen is a small skin lesion (e.g., interdigital tinea pedis). • Diabetes and Athlete's foot are among risk factors

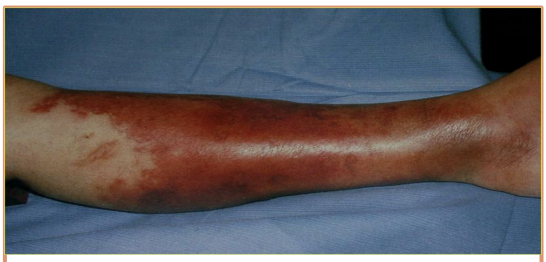
Clinical features	• **Local signs: erythema, edema, warmth, tenderness**
	  ○ **Specific to erysipelas**: raised, sharply demarcated lesion.
	  ○ **Specific to cellulitis**: poorly defined lesion with induration.
	• Cutaneous lymphatic edema (historically referred to as "peau d'orange").
	• **Common locations: lower limbs & face.**
	• Possible additional features
	  ○ Lymphangitis: red streaks radiating from the skin lesion and following the direction of the lymphatic vessels
	  ○ Lymphadenitis: swollen, tender, regional lymph nodes
	  ○ Purulent exudate
	• Systemic symptoms (in moderate/severe infections): fever, chills, confusion, nausea, headache, muscle and joint pain (+Constitutional symptoms)

Diagnosis	• Generally diagnosed based on clinical presentation.
Treatment	• Oral Penicillins. However, if you suspect MRSA (Methicillin Resistant Staph A); clindamycin, vancomycin, doxycycline or 3rd generation cephalosporins. • If the patient has signs of **septicemia or not improving after 24 hours of oral antibiotics; switch to IV Antibiotics.**



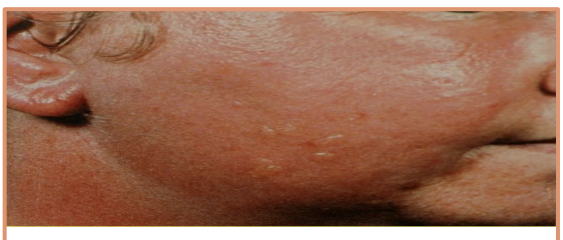
red and swollen.

Infection here is more deep ; cellulitis



Most common site for cellulitis is the leg because the leg is more prone to trauma.

More severe cellulitis erupted bullae



More swollen edematous With blisters

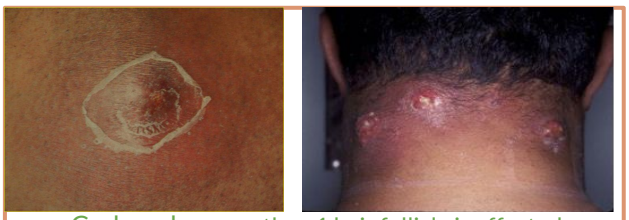
Common Skin Infections: Bacterial (Cont.)

Folliculitis

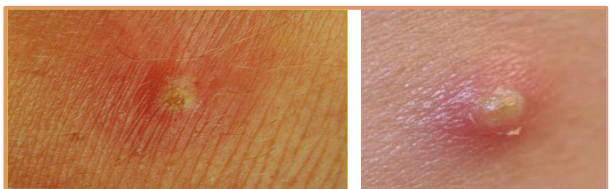
Definitions:	• **Folliculitis:**
	  ○ Localized inflammation of the hair follicle (or sebaceous glands) that is limited to the epidermis. **Basically: Infection of a hair follicle.**
	• **Furuncle:**
	  ○ Deep folliculitis beyond the dermis **in one hair follicle.**
	• **Carbuncle:**
	  ○ Confluent folliculitis that forms an inflammatory mass (**Multiple follicles**).
	Furuncles & Carbuncles are usually seen in immunocompromised pts.

Etiology	• **Staphylococcus aureus. (Most common),** usually happens when the person is shaving
	• **Others:**
	  ○ Gram negative bacteria – usually in patients with acne who are on broad spectrum antibiotics.
	  ○ Pseudomonas ("Hot tub folliculitis"). appears 8–48 hours after exposure to contaminated water
	  ○ Yeasts (candida and pityrosporum).
	  ○ Demodex.

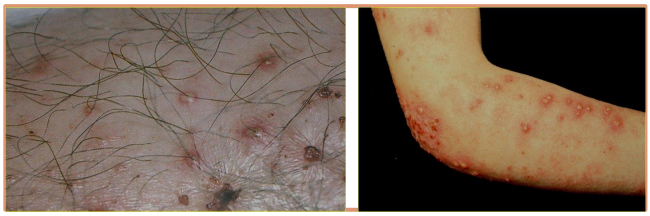
Clinical features	• **Tender papules and/or pustules, often pruritic** • **Located at the site of hair follicles** • **Possible pus drainage from follicular orifices** • **Facial furuncles can result in severe complications (e.g., periorbital cellulitis, cavernous sinus thrombosis).**
Diagnosis	• Generally diagnosed based on clinical presentation.
Treatment	• Topical antiseptics such as Chlorhexidine • **Topical antibiotics, such as Fusidic acid, Mupirocin or clindamycin.** • More resistant cases may need oral antibiotics (similar to impetigo). • Hot tub folliculitis: (P. aeruginosa)– usually self limited (ciprofloxacin in severe cases). • Gram negative: trimethoprim, isotretinoin. • Some patients will have **chronic folliculitis** (on and off breakouts). It is caused by being **a carrier of staph**. It mainly affects 4 areas (we apply topical Abx to these areas) : Axilla, groin, nostrils, and palms. These patients can be given rifampicin which penetrates more aggressively on tissues which is helpful in carrier state



Carbuncle; more than 1 hair follicle is affected



Furuncle ; deep folliculitis in diabetics



MCQ: Diabetic patients can develop these.

Common Skin Infections: Bacterial (Cont.) & Viral

Staphylococcal scalded skin syndrome (SSSS):

- Primarily affects infants and young children between 6 months and 5 years of age (Usually in nurseries and closed communities)
- Rare in adults: may occur in adults with predisposing conditions (e.g., impaired renal function or immunosuppression)
- **Widespread infection of staphylococcus, we need immediate I.V antibiotics to avoid septicemia**

Initially:

- Fever
- Skin tenderness
- Diffuse or localized erythema, often beginning **periorally**

After 24–48 hours:

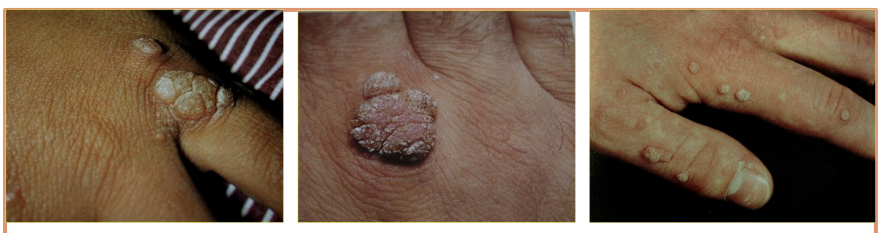
- Flaccid, easily ruptured blisters that break to reveal moist, red skin beneath (i.e., with a "scalded" appearance) → widespread sloughing of epidermal skin
- Nikolsky sign is positive
- No mucosal involvement
- Cracking, and crusting
- Signs of shock (hypotension, tachycardia)

- DDX: TEN, but the difference is TEN is due to drugs reactions, in elderly, here usually in children

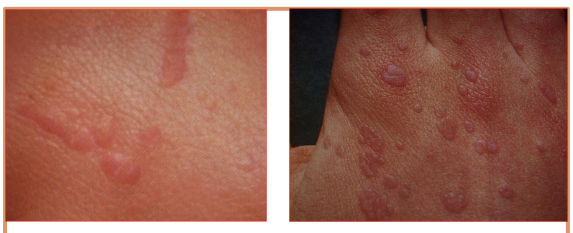
2-Viral infections

Warts / ثالول

Etiology	• Common warts are caused by HPV 2 and 4. (1 and 3 as well but it is less common) • Flat warts are associated with HPV 3 and 10 • genital warts are caused by HPV 6 and 11 and they cause cervical squamous cell carcinoma. • HPV 16,18, 31, 33 are the most aggressive in causing genital cancers.
Diagnosis	• Diagnosis of the cancer by skin biopsy • To know what subtype of Human Papilloma virus is by PCR (polymerase chain reaction)



Hyperkeratotic verrucous papules



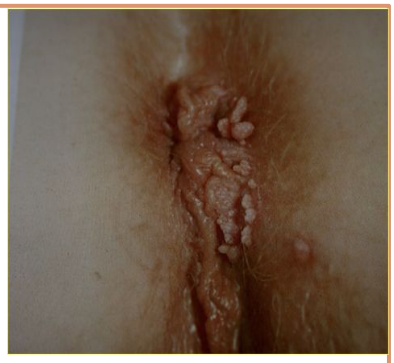
plane wart caused by HPV type 1 mainly

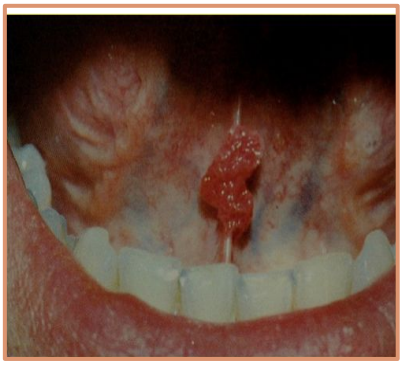
Note: Numbers of HPV are important

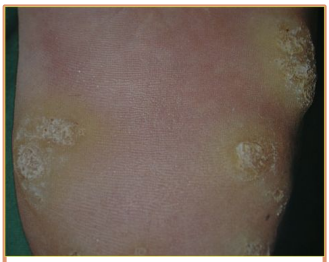
2-Viral infections

Condyloma acuminate: type of genital warts, commonly sexually transmitted.
Think of child abuse if a child has genital warts.

Description: Multiple Soft convoluted (finger like) papules.





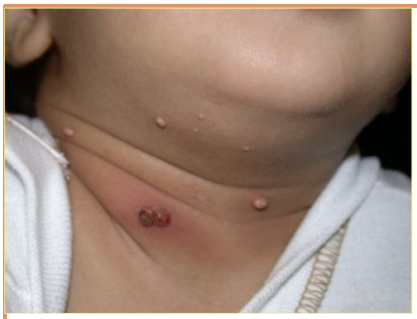


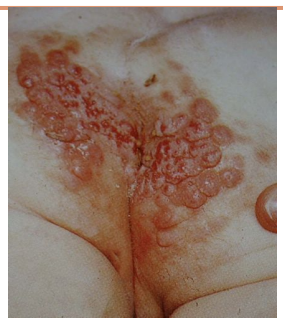
Plantar wart. (Affect sole)

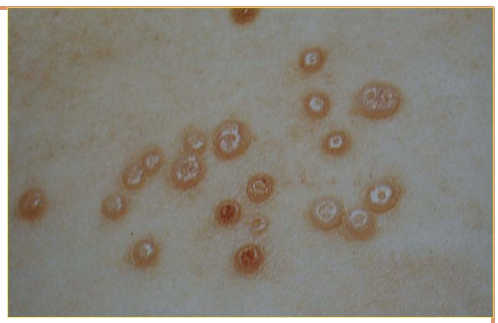
HPV: 6,11 , Usually does not cause cancer, Tx: **imiquimod**

Molluscum Contagiosum (Poxvirus):

Etiology & Epidemiology	• DNA poxvirus (molluscum contagiosum virus) • **Mostly in children** rarely with adults (in immunocompromised or as a STD) • **In genital warts in children it can be cause by autoinoculation or Abuse.** ○ **Autoinoculation: secondary infection originating from the site of an infection already present in the body.**
Diagnosis	• Diagnosis of the cancer by skin biopsy







Dome shaped shiny yellowish-whitish papule with central umbilication.

Management of Warts and Molluscum Contagiosum (Poxvirus):

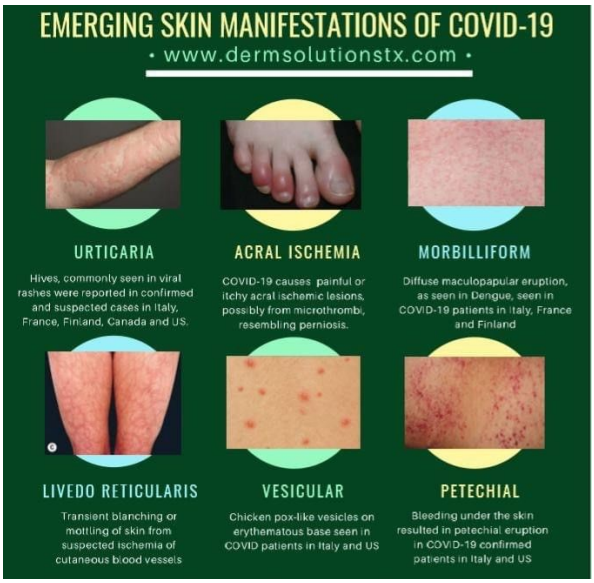
- **Both Involute spontaneously.**
- Liquid nitrogen
- Electric cautery
- Keratolytic e.g. salicylic acid

Genital Warts	• In genital warts it is painful to use the previous treatments so **Imiquimod(cream)** is the treatment of choice.
Molluscum Contagiosum	**Most effective treatment of molluscum is curettage** but you can't use that for warts because warts are deeper in the skin.

Common Skin Infections: Viral (Cont.)

COVID-19 "يمكن نجيب منه سؤال ولا اثنين"

- Can cause any skin manifestation
- Exanthematous (morbilliform) rash, predominantly involving the trunk has been reported as the most common cutaneous manifestation of COVID-19
- Acral ischemia could occur due to inflammatory processes, like any virus



Important

Monkeypox

Etiology & Epidemiology	• Caused by **Monkeypox virus**, from family **Poxviridae** (same as smallpox) • Originally in monkeys, but then transmitted to human • Endemic in West and Central Africa "Congo kinshasa" any country deals with monkeys
Clinical features	• The manifestation could be the same as chickenpox (العنقز), papules with vesicles, can be pustule
Risk factors	• **Homosexuals** • Exposure to animal reservoirs
Transmission	• Human-to-human transmission, through cutaneous or mucosal lesions or body fluids **(e.g., sex, kissing, hugging, massaging)**, Respiratory droplet, vertical or fomite transmission (e.g., from contaminated clothes, bed sheets) • **Animal-to-human transmission**: scratch or bite from an infected animal
Prevention	• By smallpox vaccines (الجدري), but since smallpox is eradicated, the vaccine is not given anymore, that's why the virus start to be endemic in these countries
Diagnoses	• Clinically & PCR • Laboratory tests can identify individuals with severe disease who have indications for inpatient management and/or antiviral therapy.
Management	• Self-limiting disease, resolve within 2 weeks • Supportive care • Isolation to prevent the spread of the disease

Common Skin Infections: Viral (Cont.)

Herpes Viruses	

Herpes Simplex	• **Usually present as a group of small blisters.**
	
	• **HSV-1(H. labialis)**
	  ○ **Mostly affects Orolabial mucosa.**
	  ○ **80% of general population** aged 18 had HSV-1 whether it was clinical or subclinical. So, if you test them with IGG for HSV-1, they'll be positive
	  ○ Infection with HSV-1 usually is acquired in childhood via saliva.
	  ○ Recurring, erythematous vesicles that turn into painful ulcerations, also known as cold sores; oral mucosa and lip borders
	  ○ **Normally self-limiting**, but sometimes it causes Primary severe Gingivostomatitis and you should give systemic antiviral.
	  ○ **Stays latent in trigeminal ganglia**. (If it affects the ophthalmic division we must urgently refer the patient to ophthalmology)
	
	• **HSV-2 (genital herpes)**
	  ○ **Mostly affects genital.**
	  ○ **Sexually transmitted.**
	  ■ Patients need counseling to teach them (not to spread the virus).
	  ■ **You should treat the partner.**
	  ○ Lesions with a punched-out appearance that ulcerate after several days in the anogenital area
	  ○ Lesions may appear as single or disseminated, painful red bumps or white vesicles.
	  ○ Stay latent in sacral ganglia
	
	• **Herpetic whitlow.**
	• **Eczema herpeticum:**
	  ○ **Infection with HSV in patients with previous skin disease (eg: atopic dermatitis, pemphigus, Darrier disease) - or any condition that breaks the integrity of the skin.**
	  ○ **Serious complication that needs admission and systemic antiviral.**
	  ○ **Any patient with active eczema and herpes should be given systemic antiviral to prevent Eczema Herpeticum.**

Diagnosis	• Tzanck Smear • Direct fluorescent antibody(DFA) • **Viral culture- most definitive**
Treatment	• Oral /IV acyclovir for: ○ **Genital, Recurrent, immunosuppressed, neonatal, Eczema Herpeticum.** • **Prophylaxis: indicated in the case of frequent (4 to 5 times) or severe relapses; 6 months - 1 year Acyclovir.**

Common Skin Infections: Viral (Cont.)

Herpes Viruses (Cont.)

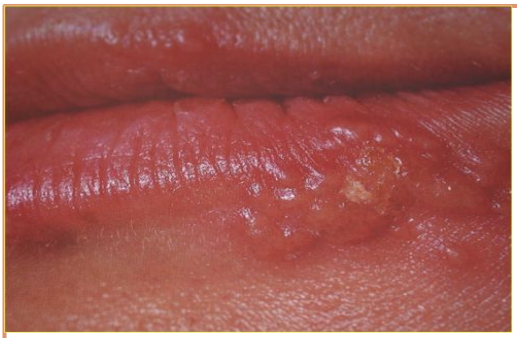
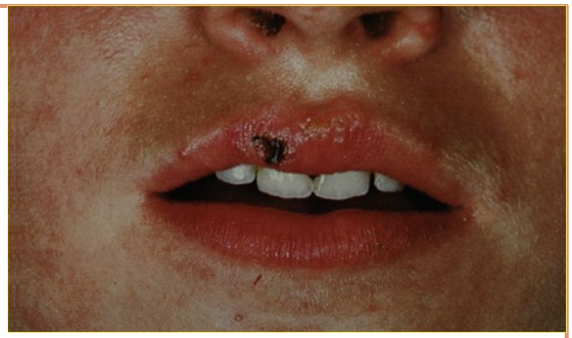
Varicella (Chicken pox)	• **Initial infection with varicella zoster virus (VZV)** which is HSV-3
	• **Highly contagious**
	• **The whole illness : 3 weeks**
	  ○ **Incubation period : 2 weeks.**
	  ○ **Prodrome of respiratory coryza.**
	  ○ **Disseminated red macules with central vesicles or pustules.**
	• Papules→ superficial vesicles filled with **clear fluid** on an erythematous base → umbilicated and crusty pustules → scabs fall off after 1–3 weeks, (often leaving a depressed base)
	• Lesions first **manifest centrally (i.e., face, scalp, and trunk)** and spread to the extremities.
	• **The patient is contagious 5 days before and 5 days after skin eruption**
	• **Mainly affects Children.** We give antivirals to prevents scarring
	  ○ **Adults : immunosuppression, pneumonia.** More severe
	• **Varicella in pregnancy:**
	  ○ 1st and 2nd trimester : risk of varicella embryopathy syndrome & abortion.
	  ○ 3rd trimester congenital varicella
	  ○ Pregnant patients with varicella should receive VZ immunoglobulin and antiviral therapy.
	• Severe varicella infection is characterized by the prolonged eruption of vesicles, which are sometimes hemorrhagic, high fever > 1 week, and dissemination of VZV to the brain (encephalitis), liver (hepatitis), and/or lungs (pneumonia).

Herpes Zoster (Shingle)	• **Adults, elderly.** > 50 Yo
	• **Following initial varicella infection VZV remains latent in sensory ganglia; when reactivated it will affects skin dermatome supplied by this ganglia.**
	• **Phases:**
	  • **Prodromal pain**
	  • **Dermatomal (grouped blisters and vesicles on background of erythema)**
	  • **Post-herpetic neuralgia**

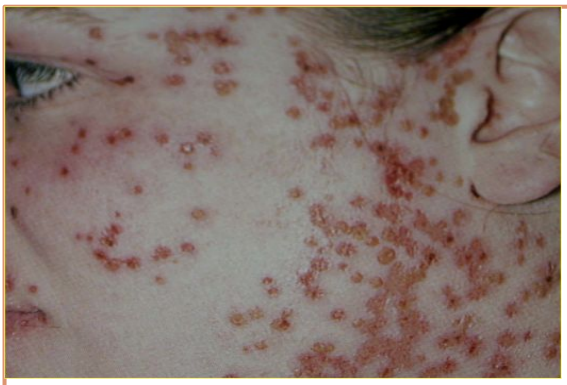
Diagnosis	• Tzanck Smear • Direct fluorescent antibody (DFA) • **Viral culture- most definitive**

Treatment	• **Varicella**
	  ○ Symptomatic for itching.
	  ○ Systemic antiviral in immunocompromised patients
	• **Zoster**
	  ○ Analgesia
	  ○ **ANTIVIRAL**(acyclovir, or "cyclovir" group in general) **(within 72 hours of skin eruption).** > To minimize the disease duration **& may help decrease Post herpetic neuralgia.**

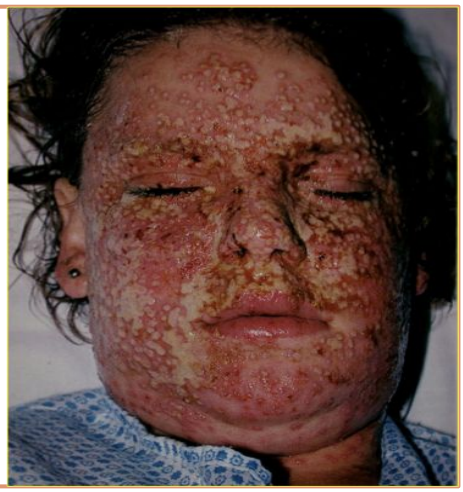
Common Skin Infections: Viral (Cont.)

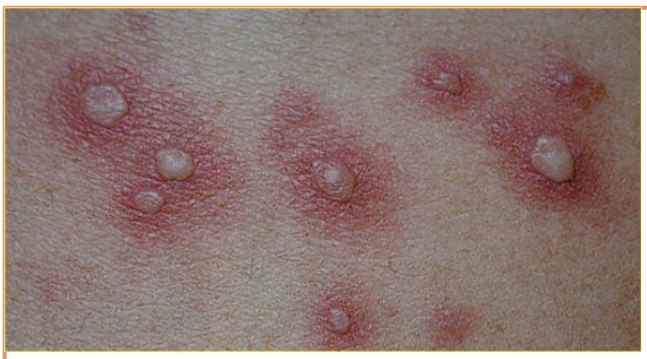
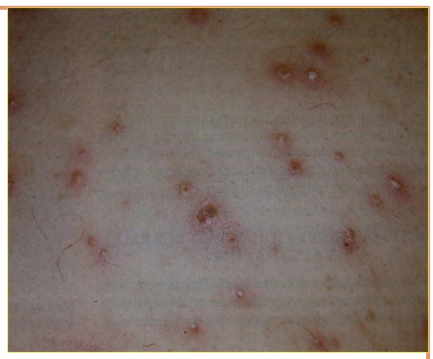



HSV-1: Multiple grouped erythematous vesicles

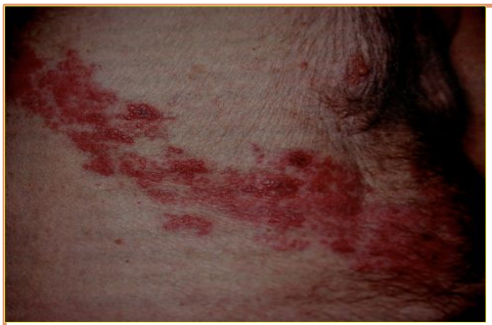
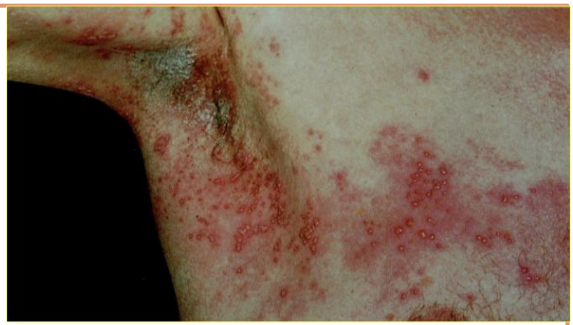


Eczema Herpeticum



Varicella: Multiple vesicles on erythematous base (dew drops)

Zoster

Common Skin Infections: Fungal

3- Fungal infections

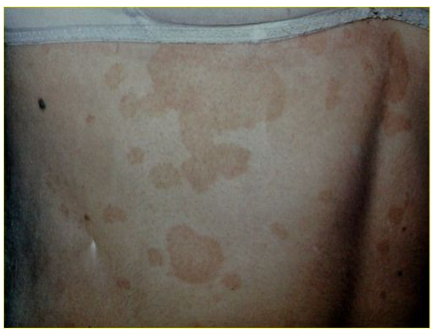
All Tinea infections are caused by dermatophytosis except tinea Versicolor caused by Malassezia Furfur and its part of our normal skin flora

Tinea Versicolor

- **Most common fungal infection in adults & adolescents. It is chronic and mostly affects the truncal area & upper extremities.**
- **Caused by Malassezia Furfur**
- **Pityriasis versicolor alba:** pale patches (hypopigmentation).
- **Pityriasis versicolor rubra:** reddish-brown (hyperpigmentation).
- **Diagnosis: Wood's lamp: coppery-orange fluorescence).**

Treatment:

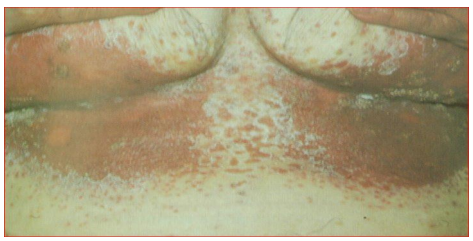
- **Topical** antifungal (e.g. ketoconazole shampoo) systemic antifungal can be used also (e.g. itraconazole).



Well-defined brownish scaly patches.

Candida Infection (intertrigo)

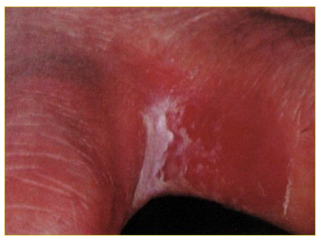
- **Affects moist and flexures**
- **BUT diabetic, obese, immunocompromised & bedridden patients are at a higher risk.**
- **Treatment:**
  - **topical antifungal +/- steroid if the patient has eczema.**

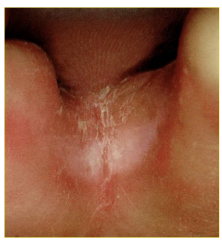


Well defined erythematous scaly eroded patches with satellite lesion.

Tinea Pedis (Athlete feet)

- Fungal infection caused by superficial **dermatophytes**.
- It affects mainly adults, (patients with moist skin in between the toes like athletes and diabetics are at higher risk).
- **Treatment:**
  - Education to dry up the skin.
  - Topical antifungal. (Azoles, Terbinafine, Nystatin)
  - In severe cases systemic antifungal.

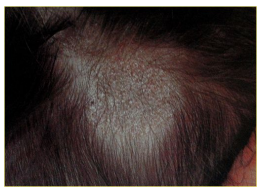


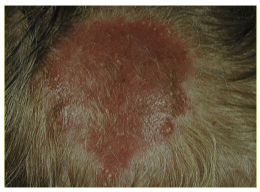


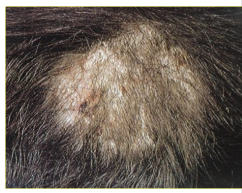
Painful erosions.
Note: If patient comes with cellulitis, check their feet as tinea pedis lesions may be an entry point for bacteria

Tinea Capitis

- Mostly in **children**
- May mimic seborrheic dermatitis
- Treatment:
  - Systemic antifungal
  - **Mainly Griseofulvin**, then Terbinafine, itraconazole
- Cats, birds, squirrels are common sources of infection



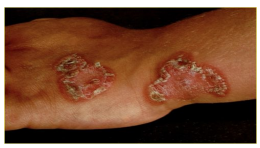


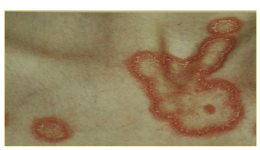


Well-defined erythematous scaly alopecic patches.
There is crust & papules w/o inflammation, unlike alopecia

Tinea Corporis

- Caused by superficial dermatophytes
- **Treatment:**
  - Single lesion > topical antifungal
  - Multiple lesions > systemic
  - antifungal (like Itraconazole)





Annular scaly active border with central clearing. In some cases it can have severe inflammation so instead of center will be red but it less than the borders

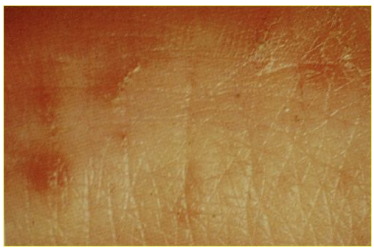
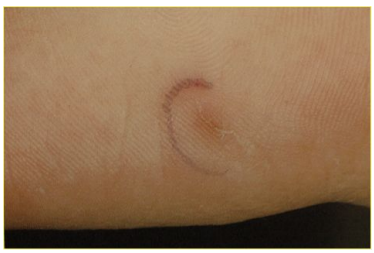
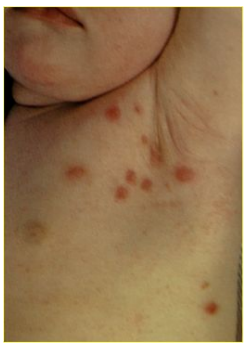
Common Skin Infections: Infestations

4- Parasitic Infestations

Infestations

Scabies
الجرب

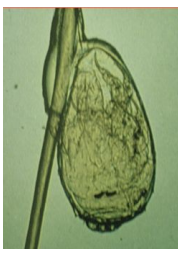
- **Causative organism:**
  - **Sarcoptes scabiei var. homini**
- Usually in groins / body folds / around nipples /genitalia.
- Affects all age group and became more common in crowded close lived people like in, shelters,travellers, homeless, prisoners,etc.
- **Intense pruritus** that increases **at night**
- **Characterized by Tunnels or Burrows (as seen in left pic).**
- **Treatment:**
  - **Topical: Permethrin / lindane cream**
  - they apply it on the whole body for 8 hours. They need to apply it again after one week and one more time after two weeks, 3 in total **to kill the newly hatched eggs**
  - Oral treatment can be used specially in epidemic situation or in severe and immunocompromised patients: Ivermectin
- Cleaning everything e.g. (clothes, blanket, pillows, etc) is required to prevent re-infection

Pediculosis
القمل

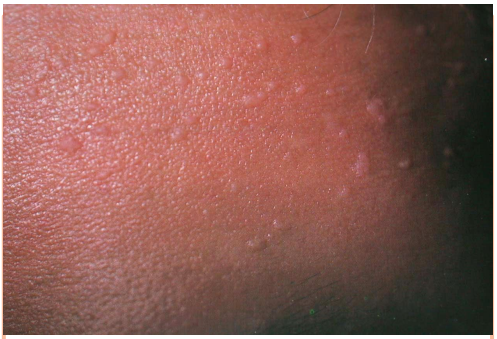
- **Affect scalp or and sometimes groin.**
- **Usually in children and homeless people**
- **Same sources as scabies**
- **May lead to secondary bacterial infection**
- **Treatment:**
  - **Topical: Permethrin / lindane** (Same as scabies) **but in shampoo formulation** to apply it over the scalp for 15 minutes then rain it with water, this can be repeated in 3 consecutive days to make sure all insects are killed.
  - Close contacts should be involved in assessment and treated if needed.

MCQ: Pediculosis in the past usually transmits a disease from one patient to another, what is it ? know it. (Epidemic typhus)

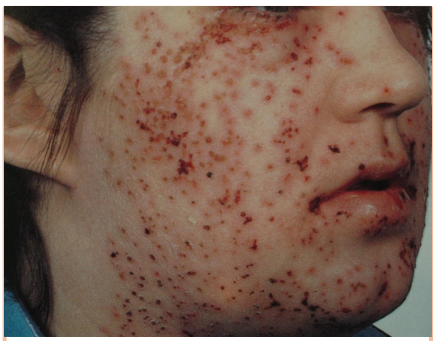



Answer from CDC: Body lice are known to transmit disease (*epidemic **typhus**, Bartonella quintana infection, and epidemic relapsing fever*).

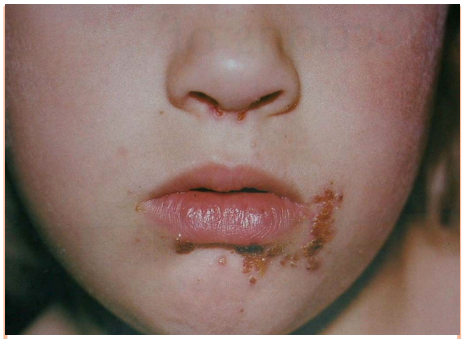
Additional photos from Dr's slides:



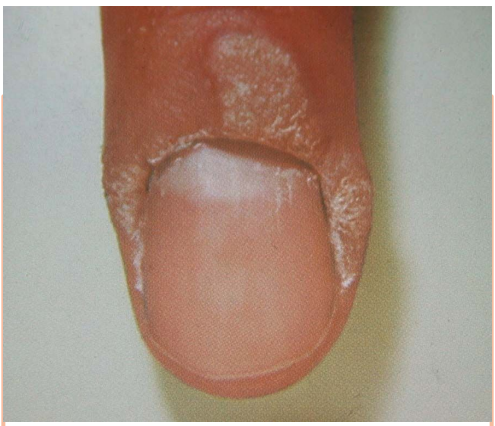
Plane wart ;HSV 3,10



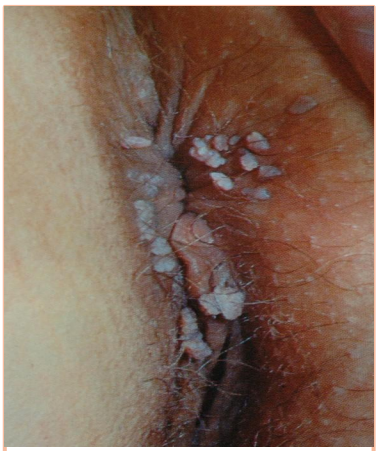
Eczema Herpeticum



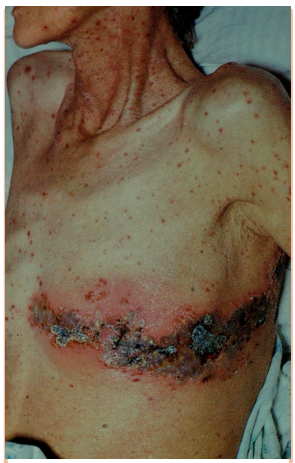
Impetigo



wart

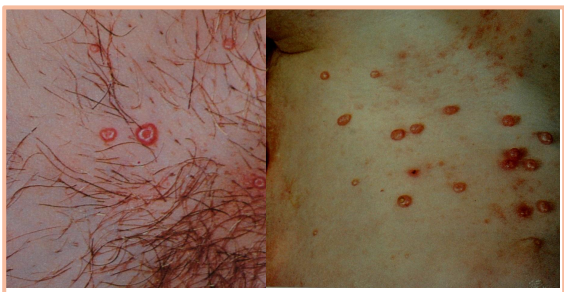


Condyloma Acuminata

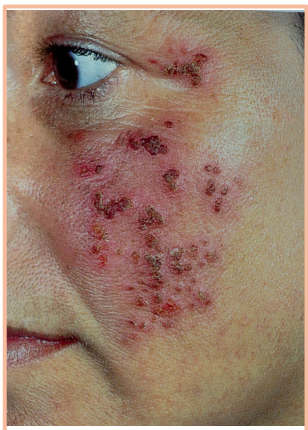


Herpes Zoster

Cellulitis



Mollascum Contagiosum



HSV-1

VERY IMPORTANT TO KNOW THE HSV AND THE HPV NUMBERS, THE DR SAID THAT HE WROTE QUESTIONS ON THEM

Quiz!

1- A 35-year-old male presented to the clinic complaining of intense itching over the body for the last two weeks that prevent him from sleeping. On skin examination he was found to have inflammatory papules and eczematous dermatitis over wrists, axillae and genitalia. The dermatologist thinks the patient has scabies. Which of the following will be part of the management of this patient?

A) Using fine-toothed comb to remove the hair nits
B) Finding the mite by Tzanck smear from the lesions
C) Treatment of the family members and contacts
D) Using Imiquimod cream over the lesions

2- What is TRUE about varicella?

A) Mainly a disease of Adulthood
B) Adulthood disease carry more risk of complications
C) Caused by reactivation of VaricellA.Zoster virus
D) Does not cause scarring

3- A 29-years-old female, in her second trimester of pregnancy, she gave history of contact with her nephew who has chicken pox today, she is worried that she might get the infection as she never had varicella before. What will be your management?

A) Reassurance
B) Start varicella zoster immunoglobulin
C) Start Acyclovir only if she develops signs and symptoms of chickenpox
D) Give her sick leave to avoid further contact with that student

4- Boy came with his parents complaining of grey patch on his scalp what's the diagnosis?

A) T. capitis
B) T. verrucosum.
C) T. schoenleinii.
D) T. tonsurans

5- A 5 year old boy is brought to the clinic with lesions on neck and trunk. On examination there are several smooth reddish elevated papules with a central punctum. What is the most likely diagnosis?

A) Melloscum contagiosum
B) Warts
C) Herpes simplex
D) Varicella zoster

Answers:
1: C, 2: B 3: B, 4:A 5:A,

Thanks!!

DERMATOLOGY TEAM 438

Dermatology Team 439

438 Team leader:
Mohsen Almutairi

438 Done by:
Mohammed Al Qahtani
Mohammed Al Humud

439 Team leader:
Mohammed Albabtain

439 Done by:
Mohammed Albabtain
Abdullatif Almashat
Hamad Almousa

438 Academic leader
Saud Bin Queid

439 Academic leader
Hamad Almousa

This lecture was updated by: 441 Academic Leader *Bassam Al Hubaysh*

Dermatology Team 441

MED441
KING SAUD UNIVERSITY

BH
Bassam Alhubaysh
REVIEWED BY