

Cutaneous infections that manifest in vesicles, bullae, and purulent lesions

Malik Sallam, M.D., Ph.D.

School of Medicine

The University of Jordan

Herpes simplex virus infections

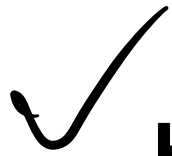
cold sore = fever blister

- HSV-1 and HSV-2 cause vesicular infections, including cold sores, gingivostomatitis, vulvovaginitis, and balanitis.
- HSV-1 causes most infections above the waist.
HSV-2 causes most infections below the waist.

Which virus most commonly causes fever blisters?

Choice	Correct answer	Attempt answer
HSV-2		
HSV-1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
VZV		
Enterovirus 71		
Coxsackievirus A16		
Coxsackievirus A6		

Score: 1 out of 1

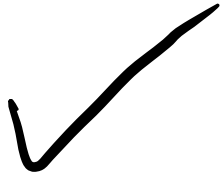


Herpes simplex virus – Clinical Manifestations

- Patients feel a tingling over the area just before lesions appear with mild fever.
- HSV-1 and HSV-2 usually produce grouped **vesicles** on an erythematous base. Lesions rupture and produce shallow ulcers with an irregular edge covered by a yellow crust.
- HSV-1 is the most common cause of cold sores and gingivostomatitis, whereas HSV-2 is the most common cause of genital herpes.
- Over time, recurrences are usually less severe.

Which one of the following statements is TRUE regarding cutaneous infections that manifest in vesicles, bullae, and purulent lesions?

Choice	Correct answer	Attempt answer
Tzanck smear can distinguish between HSV-1 and VZV infections		
Disseminated gonococcemia typically presents with coalescing vesicles on the trunk		
HSV-1 lesions are often described as grouped vesicles on an erythematous base		
Hand-foot-mouth disease caused by Enterovirus 71 never involves vesicles		
Bullae from Staphylococcus aureus infections contain multinucleated giant cells		



Herpes simple

- HSV infections are reaction.

Why does HSV-1 cause lifelong mucocutaneous infections?

Choice

Correct answer

Attempt answer

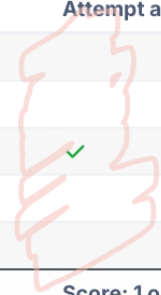
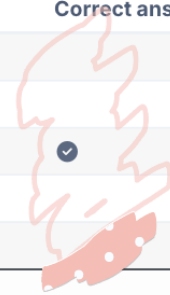
The virus integrates into host DNA

They evade humoral immunity

They establish latency in sensory ganglia

They undergo rapid antigenic shift

They infect immune-privileged sites



Score: 1 out of 1

- During primary infection, the virus invades sensory nerve endings and then migrates to the trigeminal ganglia to establish a latent infection.
- HSV-1 and HSV-2 are lifelong infections.

Herpes simplex virus – Diagnosis

- The diagnosis is usually determined by clinical manifestations.
- Tzanck smear can be performed to reveal the presence of multinucleated giant cells with intranuclear inclusions.
- Serology can be used to determine if the patient has been infected with HSV with IgG indicating previous exposure and IgM indicating recent infection.
- Samples of the lesions can be obtained for PCR.

What is the gold standard stain for observing multinucleated giant cells in HSV lesions?

Choice

Correct answer

Attempt answer

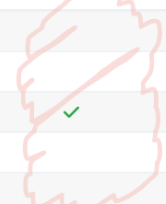
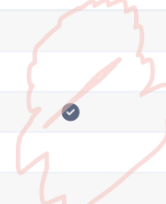
Gram stain

Ziehl-Neelsen stain

Tzanck smear

India ink

PAS stain

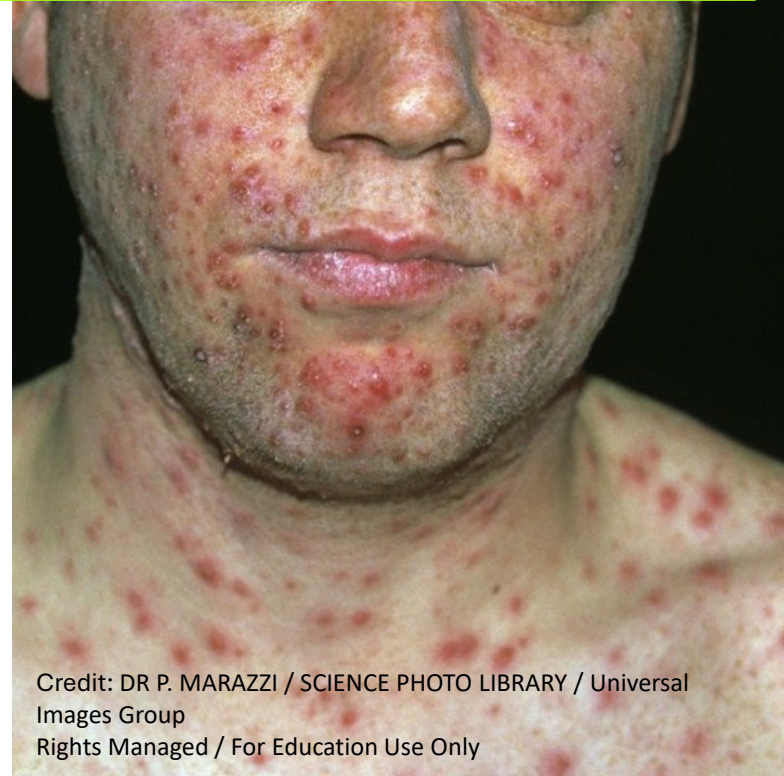


Varicella Zoster virus (VZV) infections

- Varicella (chickenpox) is a common childhood disease that results in widespread lesions. Zoster (shingles) is a localized **recurrence (restricted to one or two dermatomes)** of the **VZV** infection and is a common disease of older adults.
- Varicella vaccine is an attenuated live virus used in the prevention of varicella, while zoster vaccine is a recombinant subunit vaccine to prevent shingles.

Which virus causes reactivation along dermatomes leading to postherpetic neuralgia?

Choice	Correct answer	Attempt answer
HSV-1		
HSV-2		
VZV	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Enterovirus 71		
Coxsackievirus A		



Credit: DR P. MARAZZI / SCIENCE PHOTO LIBRARY / Universal Images Group
Rights Managed / For Education Use Only

Varicella – Clinical manifestations

Which dermatologic condition manifest in the skin as dewdrops on rose petals?

Choice	Correct answer	Attempt answer
Hand foot and mouth disease		
Gonococemia		
Varicella	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Zoster		
Herpangina		
Acne vulgaris		
Boils		

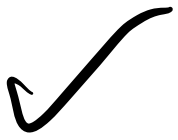
- Crops of lesions progress from macules to papules, to vesicles, to pustules, to crusts with simultaneous presence of different stages of the rash.
- The vesicles are delicate and described as “**dewdrops on rose petals**”. A **centripetal pattern** develops where there are more lesions on the trunk than on the extremities. **Pruritus is common**.
- The disease is more severe in older children and adults, and symptoms include a high fever, headache, malaise, myalgias, and pulmonary involvement.

Zoster – Clinical manifestations

- Groups of vesicles usually limited to one or two dermatomes.
- Vesicles become pustules that may coalesce to form larger bullae.
- Shingles are very painful, and pain persists for weeks, months, or years after the eruption clears (**postherpetic neuralgia**).

Which virus causes reactivation along dermatomes leading to postherpetic neuralgia?

Choice	Correct answer	Attempt answer
HSV-1		
HSV-2		
VZV	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Enterovirus 71		
Coxsackievirus A		



Hand, foot, and mouth disease (HFMD)

A child presents with fever and lesions on the tongue, palms, and soles. Which virus is the likely cause?

Choice	Correct answer	Attempt answer
VZV		
HSV-1		
HSV-2		
Coxsackievirus A16		

HFMD is a viral infection that results in **vesicles** in the mouth, hands, and feet. The most common causes of HFMD are **coxsackievirus A serotype 16** and **enterovirus 71**.



- A prodrome of low-grade **fever**, abdominal pain, and respiratory symptoms precedes vesicle formation. The **mouth** is affected first with **multiple vesicles on the tongue, buccal mucosa, lips, and pharynx** with rupture of the vesicles producing shallow ulcers. **Multiple vesicles arise on the palms and soles**, as well as the buttocks, lips, and buccal mucosa.
- Complications include **aseptic meningitis or myocarditis**.

Acne vulgaris

- Acne vulgaris (acne) is a disease that significantly affects most teenagers worldwide; with lifelong physical scars and emotional impact.
- ***Propionibacterium acnes*** is a gram-positive bacteria that is a major part of the skin microbiome. This bacterium and several other factors work together to cause acne.

Which one of the following statements is true regarding acne vulgaris?

Choice

Correct
answer

Attempt
answer

Several different types of acne lesions exist and include inflammatory papules and pustules



Laboratory diagnosis of acne vulgaris is necessary

Treatment includes the use of topical antifungals

The causative agent is a gram-negative bacteria that is a major part of the skin microbiome

Study the next

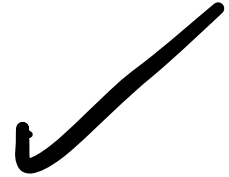
4 slides
+ this one!

Acne vulgaris – Clinical manifestations

- Several different types of acne lesions exist and include open or closed comedones, inflammatory papules, and pustules.
- Lesions are usually limited to the face, upper chest, and back.
- Scars from prior lesions may be present.



Acne vulgaris – Epidemiology



- Acne usually appears during puberty and affects 85–100% of the population.
- During adolescence, acne vulgaris is more common in boys than in girls; however, in adulthood, it is more common in women than in men.
- About 10–20% of adults may continue to experience acne.
- Acne occurs on the areas of skin with the densest population of sebaceous glands, including the face, the upper part of the chest, and the back.

Why do acne vulgaris lesions predominantly affect the face, chest, and back?

Choice	Correct answer	Attempt answer
These areas are colonized by Candida albicans		
These sites are rich in apocrine glands		
These regions have the densest number of sebaceous glands	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
The skin is thinner in these areas		
These areas have lower pH		

Acne vulgaris – Pathogenesis, Diagnosis, and Treatment



- Four factors are responsible for the development of acne:
 1. Follicular epidermal hyperproliferation with subsequent plugging of the follicle
 2. Excess sebum
 3. The presence and activity of *P. acnes*
 - propionibacterium*
ache. → - gram-positive
- skin microbiome
 4. Inflammation.
- Diagnosis of acne vulgaris is clinical.
- **Treatment** includes the use of oral tetracycline or erythromycin, facial cleansing, and topical application of benzoyl peroxide, retinoic acid, or salicylic acid. Topical oils and excessive skin friction and facial scrubbing should be avoided.

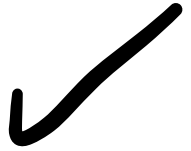
Folliculitis, furuncles, and carbuncles



- Folliculitis is a purulent bacterial infection of the hair follicle. Furuncles (boils) are deeper purulent lesions of hair follicles involving the skin and subcutaneous tissue. Carbuncles occur when several furuncles are connected subcutaneously by sinus tracts.
- ***S. aureus*** is the most common cause folliculitis, furuncles, and carbuncles.
- ***Pseudomonas aeruginosa*** is a common cause of folliculitis associated with a hot tub (hot-tub folliculitis).
- Less common causes of these lesions are *Candida* bacteria, and **diphtheroids**.

What is the most common bacterial cause of hot tub folliculitis?		
Choice	Correct answer	Attempt answer
Staphylococcus epidermidis		
Propionibacterium acnes		
Pseudomonas aeruginosa	✓	✓
Streptococcus pyogenes		
E. coli		
Serratia		
Score: 1 out of 1		

Folliculitis, furuncles, and carbuncles



- Folliculitis is a purulent bacterial infection of the hair follicle. Furuncles (boils) are deeper purulent lesions of hair follicles involving the skin and subcutaneous tissue. Carbuncles occur when several furuncles are connected subcutaneously by sinus tracts.
- ***S. aureus*** is the most common cause folliculitis, furuncles, and carbuncles.
- ***Pseudomonas aeruginosa*** is a common cause of folliculitis associated with a hot tub (hot-tub folliculitis).
- Less common causes of these lesions are *Candida* bacteria, and **diphtheroids**.

What is the most common bacterial cause of hot tub folliculitis?		
Choice	Correct answer	Attempt answer
Staphylococcus epidermidis		
Propionibacterium acnes		
Pseudomonas aeruginosa	✓	✓
Streptococcus pyogenes		
E. coli		
Serratia		
Score: 1 out of 1		

Folliculitis, furuncles, and carbuncles ✓

- Folliculitis is a purulent bacterial infection of the hair follicle. Furuncles (boils) are deeper purulent lesions of hair follicles involving the skin and subcutaneous tissue. **Carbuncles** occur when several furuncles are **connected subcutaneously by sinus tracts**.
- ***S. aureus*** is the most common cause folliculitis, furuncles, and carbuncles.
- ***Pseudomonas aeruginosa*** is a common cause of folliculitis associated with a hot tub (hot-tub folliculitis).
- Less common causes of these lesions are *C. diphtheriae*, bacteria, and **diphtheroids**.

Which one of the following statements is false regarding cutaneous infections that manifest in purulent lesions?

Choice	Correct answer	Attempt answer
Carbuncle is a painful infection involving an aggregate of contiguous hair follicles, with multiple drainage points often occurring at the back of the neck	<input type="checkbox"/>	<input type="checkbox"/>
Folliculitis is a superficial pustule located at the orifice of the hair follicle	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Furuncles are deeper purulent lesions of hair follicles involving the skin and subcutaneous tissue	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Staphylococcus aureus is the most common cause folliculitis, furuncles, and carbuncles	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Treatment of carbuncle lesions by systemic antibiotics is sufficient	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Thanks for listening!