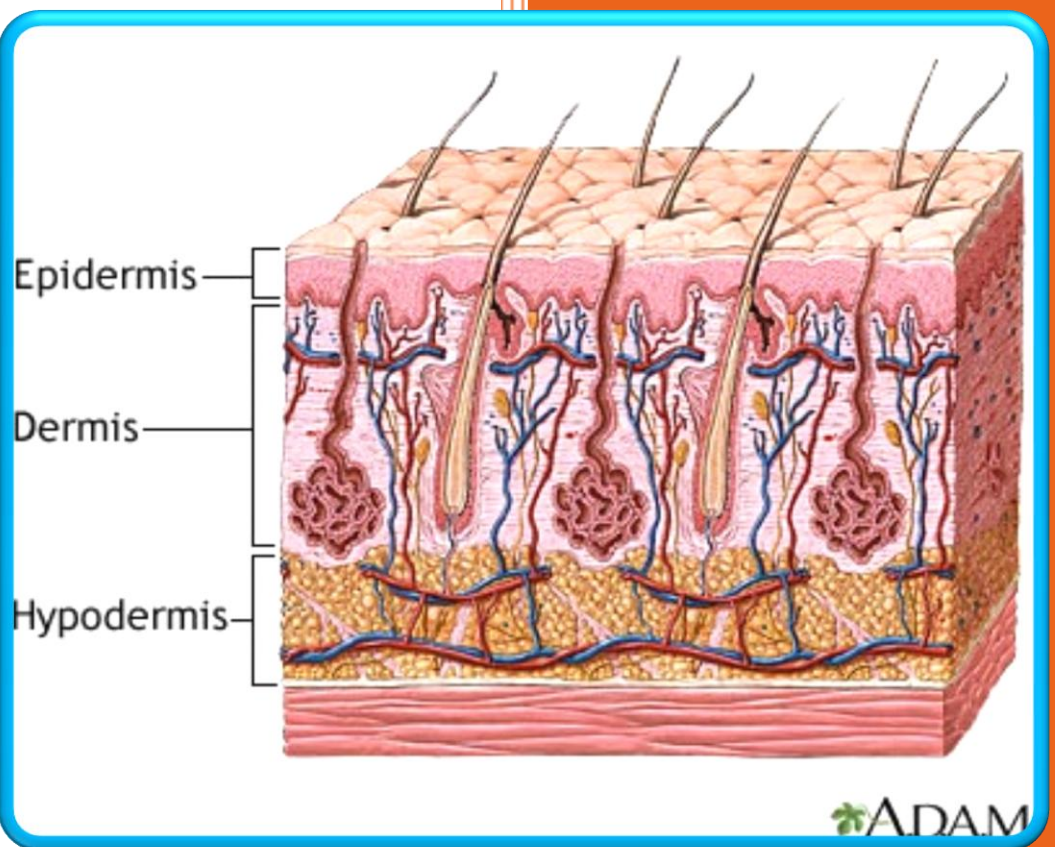


# 430

## SKIN AND SOFT-TISSUE INFECTIONS



### Done By :

Suliman Al-Faraj                      - Hanan Alrabiah  
Suliman AL-Shammari               - Ghadeer AlWuhyad  
Mohammed Alonizie                 - Khawla Alothman

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Thanks : Hussam Alrazqan  
Raed Al- Mousa

Microbiology Team

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# INTRODUCTION

- Soft-tissue infections are common.
- ***Staphylococcus aureus*** is the almost-universal cause of skin and soft tissue infections such as (furuncles<sup>1</sup>, carbuncles<sup>2</sup>, and skin abscesses), and most commonly Identified agent.
- may progress to systemic infections causing toxic shock or can affect the heart (causing endocarditis) as well as the lung.
- Easily treated with a variety of agents (antibiotic).
- Diverse etiologies<sup>3</sup> depending on the epidemiological<sup>4</sup> setting (epidemiological situation).
- Emerging antibiotic resistance among
  - *Staphylococcus aureus* (methicillin resistance)
  - *Streptococcus pyogenes* (erythromycin resistance) \* group A : can more broad to form bacterium and soft tissue infection.

## DIAGNOSIS REQUIRES

- History: patient's immune status, the geographical area, travel history, recent trauma or surgery, previous antimicrobial therapy, lifestyle, and animal exposure or bites .
- **Physical examination.**
- biopsy or aspiration.
- radiographic procedures (X-ray): to detect the level of infection and presence of gas or abscess.
- Surgical exploration or debridement<sup>(5)</sup>: Diagnostic and therapeutic.

- 1- A Furuncle: is a skin disease caused by the infection of hair follicles, resulting in the localized accumulation of pus.
- 2- A carbuncle: is an abscess larger than a boil, usually with one or more openings draining pus onto the skin.
  - Difference: Furuncles one hair follicle carbuncles many hair follicles
- 3- Etiology: is the study of causation (causes of disease).
- 4- Epidemiology is the study of patterns of health and illness and associated factors at the population level
- 5- Remove the organ.

# SKIN AND SOFT TISSUE INFECTIONS

	Impetigo ( pyoderma*)	Cutaneous abscesses.	Furuncles or “boils” and carbuncles.
<b>Definition</b>	A common skin infection ( <u>superficial</u> ) consists of discrete purulent <sup>(6)</sup> lesions	Collections of <u>pus</u> within the <u>dermis</u> and <u>deeper</u> skin tissues.	Infections of the <u>hair</u> follicle in which pus extends through the <u>dermis</u> into the subcutaneous tissue. Carbuncles extension to involve several adjacent follicular.
<b>features</b>		usually <u>painful</u> , tender, and <u>fluctuant</u> <sup>(7)</sup>	
<b>Caused by</b>	- $\beta$ -hemolytic streptococci and/or - <i>S.aureus</i> .	typically polymicrobial – mainly <i>S.aureus</i>	<i>S. aureus</i>
<b>most affected population</b>	children in tropical or subtropical regions 2–5 Yr		
<b>Site of infection</b>	usually occurs on exposed areas of the body( face and extremities)		Anywhere on <u>hairy</u> skin → furuncles. Back of the neck in especially in diabetics → carbuncles.
<b>Types</b>	Bullous <sup>(8)</sup> caused by( <i>S. aureus</i> ). Nonbullous		
<b>Systemic symptoms.</b>	usually absent		
<b>Complications</b>	Can cause poststreptococcal glomerulonephritis. (anti–DNase B) <u>group A</u>		
<b>Treatment</b>	-Penicillins - In case of Penicillinase resistant: first- generation and Erythromycin - MRSA <sup>(9)</sup> : Topical therapy with mupirocin.	Incision and evacuation of the pus Antibiotic( after removing pus)	-Larger furuncles and all carbuncles require incision and drainage. -Systemic antibiotic are unnecessary.
<b>Other notes</b>	Causes: - abrasions. - Minor trauma. - Insect bites.	-After taking a sample of pus, send it to the lab to find out whether it is MRSA or MSSA by gram stain, culture. Systemic antibiotic is required in : -multiple lesions. -Gangrene, impaired host defenses. -extensive cellulitis. -high fever.	-Spread of furunculosis caused by MSSA, and MRSA by: - Families-prisons-sports teams. - close personal contact. -Inadequate personal hygiene. -repeated attacks of furunculosis . -presence of <i>S. aureus</i> in the anterior nares- 20-40% which treated by mupirocin ointment-eradicate staphylococcal carriage nasal colonization

	Cellulitis and erysipelas	Necrotizing fasciitis flesh-eating disease
definition	Diffuse spreading skin infections, <u>excluding</u> infections associated with <u>underlying</u> suppurative foci, such as cutaneous abscesses, necrotizing fasciitis, septic arthritis, and osteomyelitis	A <u>rare infection</u> of the deeper layers of <u>skin</u> and <u>subcutaneous tissues</u> <u>easily</u> spreading across the <u>fascial</u> plane within the subcutaneous tissue.
Signs and symptoms	Fever, chills, redness and swelling. red, tender, painful plaque → Erysipelas	Change in the color of the skin. Swelling, redness, hotness and very ill. Mortality as high as 73 % if untreated
Caused by	<u>Streptococci</u> , often <u>group A</u> , but also from other groups, such as B, C, or G. (Erysipelas)→ β-hemolytic streptococci (group A or <u>S. pyogenes</u> )	- <u>group A β-hemolytic streptococci</u> , -S.aureus. -CA-MRSA, - Vibrio vulnificus, - Clostridium perfringens, -Gram-negative bacteria: E.colli, klebsiella, pseudomonas. -aerobics and anaerobics. -fungi(rarely)
most affected population	infants, young children → Erysipelas Cellulitis: β-hemolytic streptococci, Group A streptococci , Group B streptococci-diabetics <u>S. aureus</u> : penetrating trauma.	Immune-suppression patient. Trauma. Steroids. Alcoholism.
Site of infection	<u>Cellulitis</u> : acute spreading infection involves the <u>deeper dermis</u> and <u>subcutaneous tissue</u> . Erysipelas: affect the <u>upper dermis</u> .	arms, legs, and abdominal wall (Trunk area), and it is fetal in 30%-40% of cases.
Types		- polymicrobial infection - monomicrobial infection
Systemic symptoms.	fever, chills ,tachycardia	
Complications		Shock
Treatment	Penicillin-IV or oral → Erysipelas	Surgery, cut the leg, antibiotic ( selection depending on the bacteria suspected.
Other notes	<u>Risk factors</u> : -Per orbital cellulitis due to <i>Haemophilus influenzae</i> can occur in children. -organisms enter through breaches in the skin (Trauma). -Obesity, venous insufficiency, lymphatic obstruction (operations). -preexisting skin infections. -Eczema. <u>Diagnosis</u> : -CBC (leukocytosis,ESR) -Blood culture is very low yield. -pus collection (aspiration) is not helpful -needles and biopsy is required in:	-Fournier's (testicular) gangrene: it is a terminology that use when Necrotizing fasciitis is testicular. <u>Risk factors</u> : -Immune-suppression -Chronic diseases: <u>Diabetes</u> , <u>liver</u> , <u>Kidney</u> , Malignancy. -Trauma: -Recent viral infection rash ( <u>chickenpox</u> ) ▶ Steroids ▶ Alcoholism ▶ Malnutrition

- diabetes mellitus, malignancy
- animal bites, neutropenia (*Pseudomonas aeruginosa*)
- immunodeficiency.
- Obesity ,Renal Failure

**Petechiae and ecchymoses<sup>(10)</sup>**: indicates that the patient has systemic infection (blood stream infection) needs to do blood culture , that also indicates systemic toxicity-necrotizing fasciitis. Usually in lower legs, arms and face.

It is common after surgery.  
It is hyper immune respons.

destruction of skin and muscle by releasing toxins :

- Streptococcal pyogenic exotoxins
- Superantigen :  
non-specific activation of T-cells  
overproduction of cytokines  
severe systemic illness (Toxic shock syndrome)

## TREATMENT IN GENERAL:

- Antibiotic is directed against streptococci and staphylococci.

### Infections caused by MSSA SSTI:

#### ▶ oral medications

- in case of Penicillinase-resistant penicillin-:,dicloxacillin,
- Cephalexin
- **Clindamycin** - excellent antistaphylococcal activity.
- 

#### ▶ parenteral therapy, severely ill patients

- Nafcillin
- Cefazolin
- **clindamycin** or vancomycin

### infections caused by MRSA SSTI:

- Vancomycin,
- **Clindamycin**, TMP-SMZ
- Linezolid

- 6- Purulent: Containing, discharging, or causing the production of pus.
- 7- Fluctuant: unstable.
- 8- Bullous: is a small pocket of fluid within the upper layers of the skin
- 9- MRSA: methicillin resistance s.aureus  
MSSA: methicillin sensitive s.aureus
- 10- Petechiae and ecchymoses: clotting of blood below the skin when there is a damage in the blood vessels

## Important points in this lecture

	organism	Risk factor	Clinical presentation	treatment	Diagnosis
Impetigo (dermis & epidermis)	By $\beta$ -hemolytic streptococci (group A strept)  and/or <i>S.aureus</i> .	Abrasion of the skin, trauma, or insect bites	Honey crusting lesion (children)	penicillins if he has sen. >>erythromycin <div style="border: 1px solid black; padding: 5px; display: inline-block;">First- generation cephalosporins</div> flocloxacilin if it's (MRSA)>>vancomycin	
Abscesses (subcutaneous)	<i>s.aureus</i>				
Furuncle & Carbuncle (subcutaneous)	<i>s.aureus</i>	Diabetics		Same what I wrote in the impetigo	
Cellulitis (subcutaneous)	By $\beta$ -hemolytic streptococci And <i>s.aureus</i>	Diabetics, trauma, obesity, skin abrasion, any other medical condition	Redness, fever, pain, swelling	Same what I wrote in the impetigo	History, Investigation
erysipelas			+well demarcate it		
Necrotizing fasciitis	-Group A strept -polymicrobia	Same as cellulitis	Same as cellulitis + <u>sever pain</u> (feel like die)		History, Investigation, <u>bipsy</u>

### Important to know:

- Which **organism** causes which **disease**?
- In which **layer** each disease occur?
- **Treatment**.

الاسلايدات أفضل مصدر للمذاكرة ، وهذا العمل يشمل معظم نقاط المحاضرة

بالتوفيق