

A stack of books is shown from a low angle, with the spines and pages visible. The books are in various colors, including red, orange, and yellow. A semi-transparent red and orange gradient bar is overlaid on the right side of the image, containing the text. The text is in a bold, white, sans-serif font.

SKIN AND SOFT TISSUE INFECTIONS (SSTI)



SKIN AND SOFT TISSUE INFECTIONS (SSTI)

- Arise from invasion of organism through skin or from organisms that reach the skin from blood as a part of systemic infection
- Skin comprises of epidermis, dermis and subcutaneous tissues. Hair follicles and sweat glands originate in the subcutaneous tissues. Infection can involve any of these layers of skin

Infective skin manifestations & causative agents

| Skin lesions | Description | Common etiological agents |
|--------------|---|--|
| Macule | Flat, non-palpable discoloration of skin (<5 cm size). If size exceeds 5 cm, is called as patch | Dermatophytes Viral rashes (e.g. enterovirus) |
| Papule | Elevated lesions usually <5 mm in size that can be felt or palpated | Molluscum contagiosum |
| Plaque | Multiple papules may become confluent to form plaque which are palpable lesions >5 mm | Scabies (<i>Sarcoptes scabiei</i>) Warts (Human Papilloma virus) |

Infective skin manifestations & causative agents

| Skin lesions | Description | Common etiological agents |
|--------------|---|---|
| Nodule | Firm lesions >5 cm size | <i>Staphylococcus aureus</i> , <i>porothrix</i> , <i>Mycobacterium marinum</i> |
| Vesicle | Fluid-filled lesions with a diameter less than 0.5 cm | Herpes simplex virus, varicella-zoster virus |
| Bulla | Fluid-filled lesions with a diameter more than 0.5 cm | <i>Clostridium</i> Herpes simplex virus <i>Staphylococcus aureus</i> |

Infective skin manifestations & causative agents

| Skin lesions | Description | Common etiological agents |
|--------------|--|--|
| Pustule | A fluid-filled vesicle containing neutrophils (i.e. pus) and is less than 0.5 cm in diameter | <i>Candida</i> <i>Staphylococcus aureus</i> <i>Streptococcus</i> |
| Abscess | A fluid-filled lesion containing neutrophils and is more than 0.5 cm in diameter | <i>pyogenes</i> |

Infective skin manifestations & causative agents

| Skin lesions | Description | Common etiological agents |
|--------------|--|--|
| Scale | Excess dead epidermal layer | Dermatophytes <i>Streptococcus pyogenes</i> |
| Ulcer | Break in epithelial lining extending into the epidermis/dermis | <i>Bacillus anthracis</i> decubitus ulcers of leprosy |
| Erysipelas | Painful, red, indurated swollen lesion involving dermis with a well-marked raised border Associated fever and lymphadenopathy | <i>Streptococcus pyogenes</i> Other streptococci |

Infective skin manifestations & causative agents

| Skin lesions | Description | Common etiological agents |
|--------------|--|---|
| Cellulitis | Diffuse spreading infection involving deep layers of dermis Ill-defined flat red, painful lesions Associated fever and lymphadenopathy | <i>Streptococcus pyogenes</i> <i>Staphylococcus aureus</i> |

Infective skin manifestations & causative agents

| Skin lesions | Description | Common etiological agents |
|--------------|---|--|
| Impetigo | Erythematous lesions which may be bullous or non-bullous with exudates and golden-yellow crusts | Non-bullous: <i>Streptococcus pyogenes</i> Bullous: <i>Staphylococcus aureus</i> |
| Hidradenitis | Chronic infection of obstructed sweat glands | <i>Staphylococcus aureus</i> <i>Streptococcus anginosus</i> group |



Hair Follicle Infections

| Skin lesions | Description | Common etiological agents |
|--------------|--|------------------------------|
| Folliculitis | Superficial infection of single hair follicle, presents as pustule | <i>Staphylococcus aureus</i> |
| Furuncle | Deeper infections of the hair follicles, presents as abscess, spread deeply into dermis and subcutaneous tissues | |
| Carbuncle | Represents the coalescence of a number of furuncles | |

Infection of fascia and muscles

| Skin lesions | Description | Common etiological agents |
|-----------------------|--|---|
| Necrotizing fasciitis | Rapidly spreading infection of fascia | <i>Streptococcus pyogenes</i> |
| Pyomyositis | Pus formation in the muscle layer | <i>Staphylococcus aureus</i> <i>Streptococcus pyogenes</i> |
| Myonecrosis | Extensive necrosis of the muscle layer with gangrene formation | Clostridial myonecrosis Other anaerobic infections |

Agents causing surgical site wound infection

| Bacterial agents | Fungi |
|--|-------------------------|
| For most clean wounds: <ul style="list-style-type: none">- <i>Staphylococcus aureus</i>- Coagulase-negative staphylococci- <i>Enterococcus</i> | <i>Candida albicans</i> |
| If bowel integrity is compromised: <ul style="list-style-type: none">- Gram-negative flora like <i>E. coli</i> and- Anaerobic organisms like <i>Bacteroides</i>, <i>Prevotella</i>, etc. | |



Agents causing burn wound infections

Bacteria

Staphylococcus aureus (may be MRSA)

Pseudomonas aeruginosa

Coagulase-negative staphylococci (e.g. *S. epidermidis*)

Fungi

Candida albicans



Clinical types of SSTIs

- **Primary lesion:** An area of tissue with impaired structure/function due to damage by trauma or disease
- **Secondary lesion:** A lesion arising as a consequence of any primary infection

A background image showing laboratory glassware, including a beaker and a test tube, with a red and orange gradient overlay.

Laboratory Diagnosis

- **Specimen Collection**
 - Pus from wound collected by sterile swab
 - Pus from abscess collected by incision and drainage or needle aspiration
 - Vesicle or bulla fluid, collected by needle aspiration or sterile swab
 - Subcutaneous infections: from the base of the lesion or biopsy of the deep tissues
 - Skin scrapings, plucked hair or nail clippings in suspected fungal infections

A background image showing a close-up of a microscope slide being held by a hand. The slide is partially covered by a red and orange gradient bar at the top. The text 'Microscopy' is written in white on the red bar. Below the bar, a list of three bullet points is displayed in a dark red font. The background image is slightly blurred, showing the edges of the slide and the hand holding it.

Microscopy

- **Gram staining**
- **KOH mount** for suspected fungal infections (e.g. dermatophyte)
- **Tzanck smear** of the vesicle fluid suspected of herpes simplex or varicella virus infections



Culture

- Aerobic culture - inoculated onto blood agar and MacConkey agar and incubated overnight at 37°C
- **Atypical *Mycobacterium***: Lowenstein Jensen medium
- **Dermatophytes**: Sabouraud's dextrose agar
- **Anaerobic organisms**: Robertson's cooked meat broth and BHIS (brain heart infusion agar with supplements)



Culture

- **Quantitative Culture**
 - Performed to determine the number of colony forming units/gram of the tissue collected from the wound
- **Identification**
 - Accurate identification of the causative agent is done based on colony morphology, culture smear, and biochemical reactions
- **Antimicrobial Susceptibility Test**

TREATMENT

| | Definition | Surgical treatment | Empirical antibiotic |
|---|--|--|--|
| For purulent SSTIs (abscess, furuncle, carbuncle) | | | |
| Mild | Purulent infection without systemic signs of infection | Incision and drainage | No |
| Moderate | Purulent infection with systemic signs of infection | Incision and drainage and send for culture sensitivity | Oral cotrimoxazole or cephalexin or any other orally effective agent |

TREATMENT

| | Definition | Surgical treatment | Empirical antibiotic |
|---|--|--|----------------------|
| For purulent SSTIs (abscess, furuncle, carbuncle) | | | |
| Severe | Failed treatment for moderate SSTIs Immunocompromised patient Severe systemic features | Incision and drainage and send for culture sensitivity | IV vancomycin |

TREATMENT

| | Definition | Surgical treatment | Empirical antibiotic |
|--|---|--------------------|--------------------------------------|
| For non-purulent SSTIs (necrotizing infection, cellulitis, erysipelas) | | | |
| Mild | Typical cellulitis/erysipelas with no focus of purulence and no systemic signs of infection | | Oral cephalosporins or dicloxacillin |
| Moderate | Typical cellulitis/erysipelas with systemic signs of infection | | IV penicillin or ceftriaxone |

TREATMENT

| | Definition | Surgical treatment | Empirical antibiotic |
|--|---|--------------------------------|--|
| For non-purulent SSTIs (necrotizing infection, cellulitis, erysipelas) | | | |
| Severe | Failed oral antibiotic treatment Immunocompromised patient Severe systemic features Following present: bullae, skin sloughing, hypotension, or evidence of organ dysfunction | Emergency surgical debridement | Vancomycin <i>plus</i> piperacillin/ tazobactam |