

Skin and soft-tissue infections

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* Skin infections may be caused by virus, bacteria and fungal

Skin defense mechanisms

- A huge population of normal microflora colonizes on skin
- Moist areas support the growth of M.O, oil & sweat provide nutrients.
- Oil is decomposed by some M.O giving fatty acids that reduce the pH (5.5) which acts as a first line defense (innate defense) as many M.O can't grow at this pH
- Sweat is rich in salt, which acts as another defense. However, few M.O are salt tolerant

④ Rapid shedding of skin cells. →

Protective mechanisms

① Present Normal Microflora

② moist area, oil

③ Sweat which contain salt that ~~is~~ prevent M.O growth

Mechanism لا آت يوجب

acidic و Salt M.O / قدرة انها قتل بوسط
Skin infections و حدوث

Micro organism
منع عن
لا تفسد في
وسط

تقدر خلايا البثرة بسرعة وهذا
بشكل barrier يمنع دخول
M.O داخل الجسم

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Normal flora of skin

الجلد
infections

تكون بسبب
Staphylococci
وتلعبها بآلي

antistaph

- The normal skin is colonised mainly by G+ Gram positive microorganisms (staphylococci and diphtheroids).
- Some Gram-negatives and yeasts, which can survive in the relatively harsh conditions – dryness, acidity and the presence of fatty acids, sebum and salt.
- The normal skin flora **protects against** infection by other microorganisms that must compete to survive.

antigenism

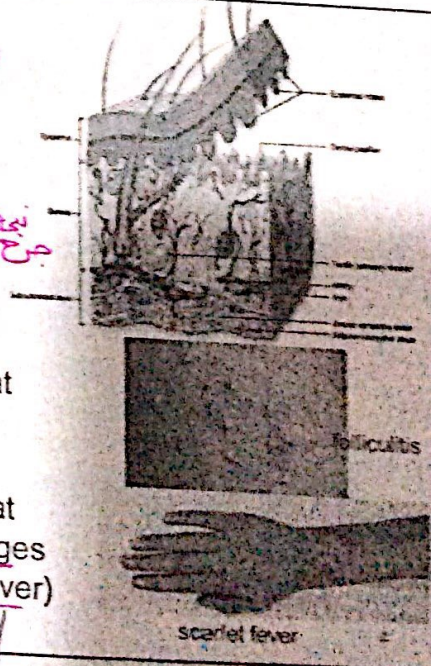
العلاقة
بين

3

Pathogenesis of skin

الطبقة الأولى
Skin

- Superficial skin infections affect the epidermis and dermis, e.g. impetigo
- Deeper infections affect the subcutaneous tissue, e.g. cellulitis
- Infections of skin structures cause folliculitis. in hair follicle
- Infections may arise from pathogens that gain entry through damaged skin (streptococcal cellulitis).
- Bacterial toxins produced by infections at other sites may also result in skin changes (group A streptococci causing scarlet fever)



Systemic infection
Skin Rash

DISEASES OF THE SKIN

1. Uncomplicated disease: have a low risk for life- or limb-threatening infection and many can be treated with empiric oral antibiotics, with occasional surgical drainage (folliculitis, acne, impetigo, and cellulitis). Severe infections require IV antibiotics.

2. Complicated disease: have a high risk for life- or limb-threatening infection, and often necessitate hospital admission, surgical debridement, along with broad-spectrum antibiotic therapy

easy to be
control and
treated

Life threatening
لا يتأثر بسهولة

تحتاج تدخل
جراحي

Bacterial Skin Diseases

Type of Infection	Appearance of Lesion	Description of Lesion	Layer of Skin Involved	Common Pathogens	Treatment
Impetigo Contagious السبب بكتريا		Vesicles with honey-colored crust, often on the face of a child	Epidermis سطح	Staphylococcus aureus, Streptococcus pyogenes	Few lesions: topical antibiotics (e.g., mupirocin); numerous lesions: systemic therapy (e.g., cephalosporins, clindamycin)
Cellulitis		Erythematous diffuse flat lesion with irregular border بكتريا تدخل dermis بمرحلة ادخلية جراحية	Deep dermis	Streptococcus pyogenes, Staphylococcus aureus > Staphylococcus aureus	Systemic antibiotics eg cephalosporins or clindamycin
Folliculitis		Localized, inflamed papules containing a small amount of pus inflammation of hair follicle	Hair follicle	S. aureus, Pseudomonas aeruginosa (associated with hot tubs)	Antibiotics often not needed; warm, moist compresses are helpful

Bacterial Skin Diseases

حب الشباب

- **Acne** occurs in both males and females
- M.O feed on sebum.
- Ducts of glands & and tissue become inflamed
- lesions occur within sebaceous follicles with keratin plugs blocking the sebaceous canal, resulting in 'blackheads'.
- Blackheads" are mild form of acne where hair follicles & sebaceous glands are plugged with sebum & keratin, as the surface oxidizes, they take black color .

Formation of Skin Pimples and Acne



1. Healthy follicle
2. Duct clogged by dead cells, sebum starts to accumulate
3. Bacterial infection, inflammation triggered, - pimple
4. Follicle ruptures, puslike material with fluid formed - acne



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تكوين المراهقين
عادة ليست
لبنية المهنات

تقع تحت
الرقبة
sebum له 20

* حب الشباب عن gland تفرز Sebum عن طريق Canal
تأثيره بكتيريا تعيش على Sebum في duct ونقل inflammation
في duct و gland

لـ يتخذها تفرز Sebum بسبب infection بتسر

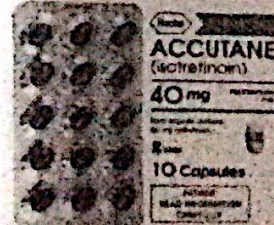
اصوب راحا مشوك

وتكون (Pimples) وتراكم Sebum ويحل Rubtore في Folicle

Bacterial Skin Diseases- Acne

- Bacteria, especially *Propionibacterium acnes*, infect the area and cause more inflammation, more tissue destruction, and scarring.
- Acne is treated with:
 1. frequent cleansing of the skin and
 2. topical ointments to reduce the risk of infection.
- (Accutane®) Isotretinoin (Vit A derivative) for severe & persistent cases, it inhibits sebum production but has serious side effects

بقل
مشاكل كثير
وتحتاج فحوصات
قبل اخذنه



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ممكن ان يحل تشوهات

خلقية في الاجنة

ويحل dryness

العدوى

Bacterial Skin Diseases -Burn Infections

• **Burn Infections** Severe burns destroy much of the body's protective covering and provide ideal conditions for infection

• Burn infections (mainly nosocomial), are responsible for 80% of deaths among burn patients. العدوى المكتسبة في المستشفى

• *Pseudomonas aeruginosa* is the prime cause of life-threatening burn infections. Many strains of these Gram-negative bacilli are antibiotic-resistant.

تقل *Pseudomonas aeruginosa* infection should be suspected when a **greenish discoloration** appears at the burn site and cultures have a grapelike odor.



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العلاج : antibiotic بامتلاكه انه يحدث تراكم في

dead cell (eschar) (Crust)

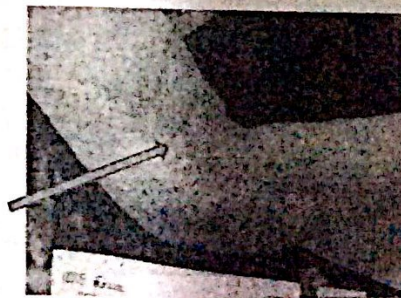
لا يتم تنظيفه لأنها تشكل barrier عن وصول

العلاج (Site of infection) موقع الإصابة

Bacterial Skin Diseases -Burn Infections

- The thick crust formed over severe burn (eschar) lacks blood vessels & bacteria grow beneath it cause severe infections → antibiotics can not reach these areas,

Removal of eschar by surgical scraping (debridement) helps antibiotics reach these sites.



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Bacterial Skin Diseases

Spore
Forming bacteria
معدية

- Associated with deep wounds, **gas gangrene** often is a mixed infection caused by two or more species of Clostridium, especially C. perfringens.



- Spores of these obligately anaerobic organisms are introduced by injuries or surgery into tissues where circulation is impaired.

- In body regions where oxygen concentration is low, spores germinate, multiply, and produce toxins and enzymes such that kill other host cells and extend the anaerobic environment.

تعيش في بيئة لا يوجد فيها O_2
وهي anaerobic bacteria
وتفرز enzyme toxin

تتلفوا
Skin

وتتغير لون الجلد الى black

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Bacterial Skin Diseases

العدوى
العفن

- Gas gangrene**
- Foul odor** is such a prominent feature of gas gangrene
- Characterized by high fever, shock, tissue destruction & blackening of skin, if not treated causes death
- Treatment:** Penicillin & removal of dead tissue or amputation to affected limbs
- Controversial treatment:** use of hyperbaric O_2 (inhibits obligate anaerobes)
- Prevention:** adequate cleaning of wounds, delaying closing of wounds & provide drainage when they are closed.

أعريضها للهواء (O_2) حتى يلتئم الجرح

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highly contagious disease
transfer by Respiratory droplet or secretions

Viral Skin Diseases

Rubella, or German measles, is the mildest of several human viral diseases

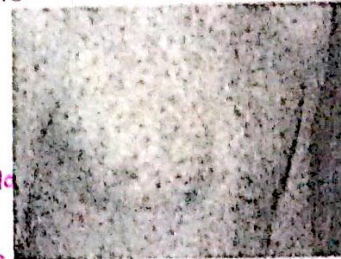
that cause exanthema or skin rash.

A rash, the main symptom of rubella, appears first on the trunk [16 to 21] days after infection.

The rash is pink & flat → trunk

• Transmission: Rubella highly contagious, transmitted by nasal secretions before & after the appearance of rash.

• Immunity: part of attenuated viral vaccine (MMR). Viruses appear in the nasopharynx after immunization & some individuals experience mild symptoms



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* ما لا علاج له من بعد إصابته

عن طريق التطعيم (MMR)

Symptomatic
Control

يعني صار فيه حرارة بعض خافض حرارة

Viral Skin Diseases

• Measles, or rubeola, is a febrile (accompanied by fever) disease with a rash caused by the rubeola virus. The paramyxovirus invades lymphatic tissue and blood.

• After the virus enters the body through the nose, mouth, or conjunctiva, symptoms appear in 9 to 11 days in children and in 21 days in adults.

• Koplik's spots, white spots with central bluish specks, appear on the upper lip and cheek mucosa 2 or 3 days before other symptoms such as fever, conjunctivitis, and cough.



يعرض
dermal Symptom

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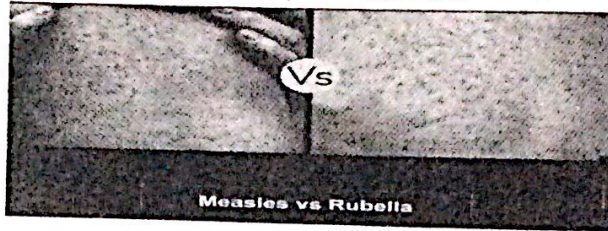
خلاله بقدر أضعف الحصبة
Rubeola أو Rubella

Viral Skin Diseases

Complications

مضاعفات
الحياة خاصة
في الأطفال

- **Measles, or German Measeales (rubeola)**
If the virus invades the lungs, kidneys, or brain, the common childhood disease often is fatal.
- **Transmission.** The measles virus is highly contagious; its portal of entry is the respiratory tract while coughing and sneezing.
- **Treatment:** alleviating symptoms
- **Prevention:** vaccination (MMR). Immunity acquired after the disease is lifelong.



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تدخل عن طريق
Resp tract
عطاس، سعال عن طريق
شخص مصاب

علاج للطوفان هو الـ (MMR)

كأن يصاب في الحصبة ما يرجع بـ ١٠٠% من مرة أخرى لأنه صار عنده
Long life immunity

(Symptomatic Control)

الفيروس سببهم
Virus

Rubella	Measles
Rubella is caused by the Rubella virus that invades the lymph nodes, eyes, and skin.	Measles is caused by Morbillivirus that infects the <u>respiratory system</u> .
Usually mild, but can get severe in pregnant women. → كان من ضمن يعمل تشوهات خلقية للجنين (Teratogenesis)	Severe and can be life-threatening.
Characterized by a pink rash that starts in the face and spreads to the body, lasting for <u>three to five days</u> . The rash may be itchy and associated with other symptoms, such as <u>red and watery eyes</u> , <u>runny nose</u> , <u>headache</u> , and <u>joint pain</u> .	Symptoms start with high fever, runny nose, cough, and red, watery eyes. Tiny white spots with bluish-white centers on a red background are found inside the mouth on the inner lining of the cheek (Koplik's spots) <u>two-three days</u> after the initial symptoms. The <u>rash</u> appears as flat red spots on the face at the <u>hairline</u> and spreads downward to the <u>neck</u> , <u>trunk</u> , <u>arms</u> , <u>legs</u> , and <u>feet</u> .

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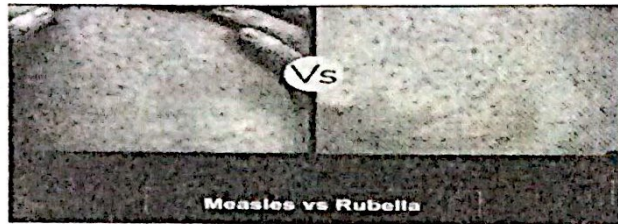
إذا شخص مصاب فيهم لازم ما يختلط بالناس
وبسبب أمراض خاصة فيه وما يشاركها
لأنه المرض معدي جدا

Viral Skin Diseases

Complications

مهددة
الحياة خاصة
في الأطفال

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تنتقل عن طريق
Resp tract
عطاس، سعال عن طريق
شخص مصاب

ما هو علاج للطفح هو الـ (MMR)

كأنك بتصاب في الحصبة فأبرمج بتصاب فيها مرة أخرى لأنه صاعده
Long life immunity

(Symptomatic)
Control

التي تسببهم
Virus

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إذا شخص مصاب فيهم لازم ما يختلط بالناس
ويستخدم أدوات خاصة فيه وما يشاركها
لأنه المرض معدي جداً

Subject _____ Day _____ Date _____

* المشقة لأعصاب في الجري انزوتون بسبب *herpes Virus*

هو يعيش من (*Latent Virus*)

يعني بقدر يتخفى ويرجع بصير له *Reactivated*

وعمل *Reinfection* بـ *Fever*, *Stress*, *فقر*
مناعة

وممكن يرجع *Shingles Infection*

Viral Skin Diseases

- In **shingles**, painful lesions like those of chickenpox usually are confined to a single region supplied by a particular nerve.
- Eruptions arise from latent viruses acquired during a prior case of chickenpox.
- During the latent period, these viruses reside in ganglia in the cranium and near the spine. When reactivated, the viruses spread from a ganglion along the pathway of its associated nerve(s).
- The latent virus is activated when cell-mediated immunity drops below a critical, minimal level.



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أكثر أشخاص
لوث عندهم
يلي عندهم
نقص مناعة
مثل: مرضى
السرطان
والسكري

دormant أو latent Phase State

في nerve ويطلق منها ويعد Reinfected
ويمكن أن يصيب أماكن مختلفة على الظهر والبطن
أو الكتف حسب من أي nerve طلع هذا
(Latent Virus)

Shingles

- Symptoms range from mild itching to continuous, severe pain and can include headache, fever, and malaise. Lesions often appear on the trunk in a girdle-like pattern (zoster, "girdle").
- Shingles is most severe in individuals with malignancies or immune disorders. In such patients, lesions may cover wide areas of the skin and sometimes spread to internal organs, where they can be fatal.
- Treatment of shingles usually includes a combination of antiviral and pain-relieving medications.
- The areas affected by the rash should be kept clean and dry. In general, it is best to avoid applying lotions or creams (eg, moisturizer) to the affected area, as this can further irritate the skin.

مثل فطير
as infection
لأن يعتبر فطير
as side effect
أو عرض نتيجة
infection ثانية
وفي أشخاص

يمكن أن تدخل عن طريق الدم إلى
other organs

ما لا يطغى

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antiviral تعطي Symptomatic
oral Like acyclovir Control
topical

ببدا المنطقة ناسفة دائماً لانه الرطوبة تزيد Irritation
وداح يزيد الوضع سوءاً
+ لا تتركها مافظ على المنطقة نظيفة

ما يتحلق خاصة
يلي عندهم نقص مناعة

من الفيروسات التي تسبب سرطان عنق الرحم
Cervical Cancer

Viral Skin Diseases

التأليل

Warts caused by human papilloma viruses (HPV). Human Papilloma Virus

HPV specifically attack skin and mucous membranes.

- Warts grow freely in many sites in the body -the skin, the genital and the oral cavity.

يكون Sexually Trans

- The Nature of Warts. Warts vary in appearance, area of occurrence, and pathogenicity. Some are barely visible and self-limiting—that is, they do not grow or spread— and others, such as laryngeal warts, are larger but benign.

A few warts are malignant -cause 99% of all cases of cervical cancer

تتواجد على
الظافر قاع القدم و
Genital



يمكن يخلع عن طريق
استخدام نفس الأدوات
مثل مقص الظافر

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يعالج بـ
OTC drugs

يمكن يروح
كلاوبس
يمكن يروح
سنوات

الجلد و يمكن يرشوا عليه نيتروجن (Freezing)

أو Salicylic acid (كاوي للجلد)

بس لازم وضعه فازلين حول warts حتى يحرقها من
Salicylic acid

Viral Skin Diseases

Warts

Transmission. .. human papilloma viruses are transmitted by direct contact, usually between humans, or by fomites.

- Dermal warts form when the virus enters the skin or mucous membranes through abrasions. Genital warts are sexually transmitted.

Treatment:

1. cryotherapy (freezing & excision),
2. caustic chemical agents,
3. surgery.



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Fungal skin diseases

- The fungi that invade keratinized tissue are called **dermatophytes**.
- fungal skin diseases are called **dermatomycoses**.
- They can be caused by any one of several organisms mainly : *Fungi*
Epidermophyton, *Microsporum*, and *Trichophyton*.
- They cause various types of** ringworm and attack the skin, nails, and hair.
hair, skin, nails, scalp ← target
- Fungi that invade subcutaneous tissue live in soil or as airborne spores.
- They **enter** tissues through **wounds**.

تكون صعبة
في الأشخاص
الذين لديهم
نقص مناعة

Fungal
infections

تدخل عن طريق
تدخل Subcutaneous
tissue

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Common dermatophyte (ringworm) infections

Infection	Site	Dermatophyte	Clinical features
<i>Tinea corporis</i>	Trunk	<i>Epidermophyton floccosum</i>	Pruritus; circular erythematous lesion, scaling, clearing from centre
	Limbs	<i>Trichophyton</i> spp. <i>Microsporum</i> spp.	
<i>Tinea cruris</i>	Groin	<i>Epidermophyton floccosum</i> <i>Trichophyton rubrum</i>	Pruritus; lesions similar to tinea corporis
<i>Tinea pedis</i>	Feet	<i>Epidermophyton floccosum</i> <i>Trichophyton</i> spp.	Pruritus; cracking and scaling between toes
<i>Tinea unguium</i>	Nails	<i>Trichophyton</i> spp.	Thick, yellowish nails with surrounding erythema
<i>Tinea capitis</i>	Hair	<i>Trichophyton tonsurans</i> <i>Microsporum audouinii</i> <i>Microsporum canis</i>	Erythematous patches on scalp with scaling; hairs break, leaving bald patches

Scalp

trunk

القسم الرياضي
athletes Foot

Scalp

كلها رياضية
حادة
هاد مطلوب
العמוד

مطلوب هاد
العמוד

هادي مش ثقيلة

هاد العמוד
مطلوب

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Common dermatophyte (ringworm) infections



Tinea capitis



Tinea pedis



Tinea corporis

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التهاب بين الأصابع

most common cause

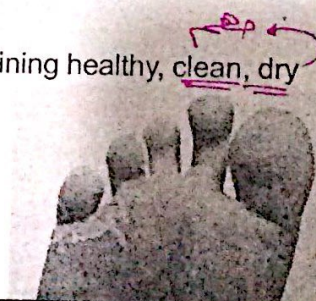
Poor hygiene

يمكن نقل bacterial

Infection as Secondary infection

Fungal skin diseases

- **Athlete's Foot. In athlete's foot, or tinea pedis** → ليس نتيجة ليس الأحذية لفترة طويلة + عدم تنظيف القدم بشكل جيد
- **Fungi** invade the skin between the toes and cause dry, scaly lesions. Fluid filled lesions develop on moist, sweaty feet.
- Then the skin cracks and peels, and a secondary bacterial infection leads to itchy, white areas between the toes.
- Prevention of athlete's foot depends on maintaining healthy, clean, dry feet that can resist the opportunism of fungi.
- Treatment : ^{antifungal} topical miconazole
- Prevention: keeping clean & dry feet.



وهي اسه نام hygiene وتنظيف القدم

وتنظيفها جيداً

Fungal diseases

Opportunistic fungal infections

Candidiasis

- Some fungi & yeast can invade human flora when immunity is impaired.
- Candida albicans (yeast) present as normal flora in GI & urogenital tracts. ← ممكن يصيب Oral, GI و
- Superficial candidiasis appears as thrush, (milky patches of inflammation on oral mucosa) in infants, diabetics, immunocompromised patients or those receiving AB for long time. ← اكثر اهمالية مستوفى
- it causes vaginitis (in pregnancy, diabetics, those using contraceptives as sugar level is elevated in vagina).



oral candidiasis

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← Immune Compromised
منهكة لها اكثر الأشخاص المعرضين
Fungal infections

← لكنه ليس
Sexually
Transmitted
disease

Fungal skin diseases

قشرة الشعر

- Dandruff-flaking skin cells from an inflamed scalp.
- In dandruff sufferers, the cells flake off in big clusters in only 7 to 10 days
- The yeast, Malassezia, occurs in everyone's scalp, but only overgrows in some, causing inflammation, and excessive shedding.
- Treatment: apply shampoos as ketoconazole.



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* المواد الكيميائية تزيد من قشرة
والصبغات

← نقل مادة
واخراج
للشعر

شامبو علاجي
لجوبي

- **Viral conjunctivitis:**
- Viral conjunctivitis is commonly caused by adenovirus and is often called pink eye.
- It can also be caused by:
 1. herpes simplex virus,
 2. aricella zoster virus, and
 3. various other viruses.

ببداً بعين وبغفل
للعين الثاني



- Viral conjunctivitis often begins in one eye and then infects the other eye within a few days. *watery eye secretions, احمرار العين*
- Patients often present with an upper respiratory tract infection or recent exposure to someone with viral conjunctivitis. *يمكن أن تحدث مع وجود*
← Upper Respiratory
- Antiviral medications may be an option if your doctor determines that your viral conjunctivitis is caused by the herpes simplex virus.

watery eye secretions, itchy, احمرار العين

Upper Respiratory Infection ← وانتقل للعين

Ointment

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* Contagious

لازم الحجاب بغير أدوات ما حذا بغيره
غيره

Contagious
لا ينتشر
الاصاب اعضاءا واحدة
بعضه
غيره
Bacterial conjunct
inflammation of the
organisms such as
1. Staphylococcus aureus

Bacterial conjunctivitis, or pinkeye, is an inflammation of the conjunctiva caused by organisms such as

1. *Staphylococcus aureus*,
2. *Streptococcus pneumoniae*,
3. *Pseudomonas* species, and
4. *Haemophilus influenzae*.

- It is extremely contagious, especially among children.

- Topically applied sulfonamide ointment or erythromycin is an effective treatment.

- Do not share towels or eye cosmetics



Pink eye

Sticky Secretions
Yellowish Secretions

ointment
drops 91

* مرض الصبلاقي يعني التهاب الغشاء المخاطي للعين نوع Conjunctivitis

* اذا فيه Watery Secretion (دمع) ← يكون Viral Conjun

❦ اذا العين بتكون مسكوة وقت الاستيقاظ من النوم يكون

↳ Bacterial Conju → Sticky Secretion