

## CHAPTER 7 BACTERIAL INFECTIONS

(NATO STANAG 2122, CENTO  
STANAG 2122, SEATO STANAG 2122)

### **Bacteria**

Bacteria are microscopic, single-celled forms of plant life, containing no chlorophyll. They live on the skin, on the surface of the stratum corneum, and in the hair follicles of the skin.

Most bacteria are harmless to humans. Some are even necessary to life, such as those in the intestines that make Vitamins K and B<sub>12</sub>. Others, however, cause disease and are *pathogenic* (*path-o-gen'-ik*).

Bacteria favor an environment of heat and moisture in which to develop and multiply. Weather and skin conditions alike affect their activity. For example, bacterial skin infections are very common in hot, humid climates to include the tropics, and parts of the United States. Likewise, bacterial growth is helped by the moisture from a cut or scratch.

It is not possible by any safe method to kill all skin bacteria. Soap and water washing removes many of them and is worthwhile, if not done so often or so roughly that it damages the skin barrier. Pure alcohol kills some bacteria, but a mixture of 70 percent alcohol and 30 percent water is most effective.

### **Some Bacteria That Produce Disease**

Two bacteria cause the greatest number of infections.

#### **STAPHYLOCOCCUS AUREUS** (staff-e-low-kok'-us oar'-ee-us)

Staphylococcus aureus is commonly called "*staph.*"

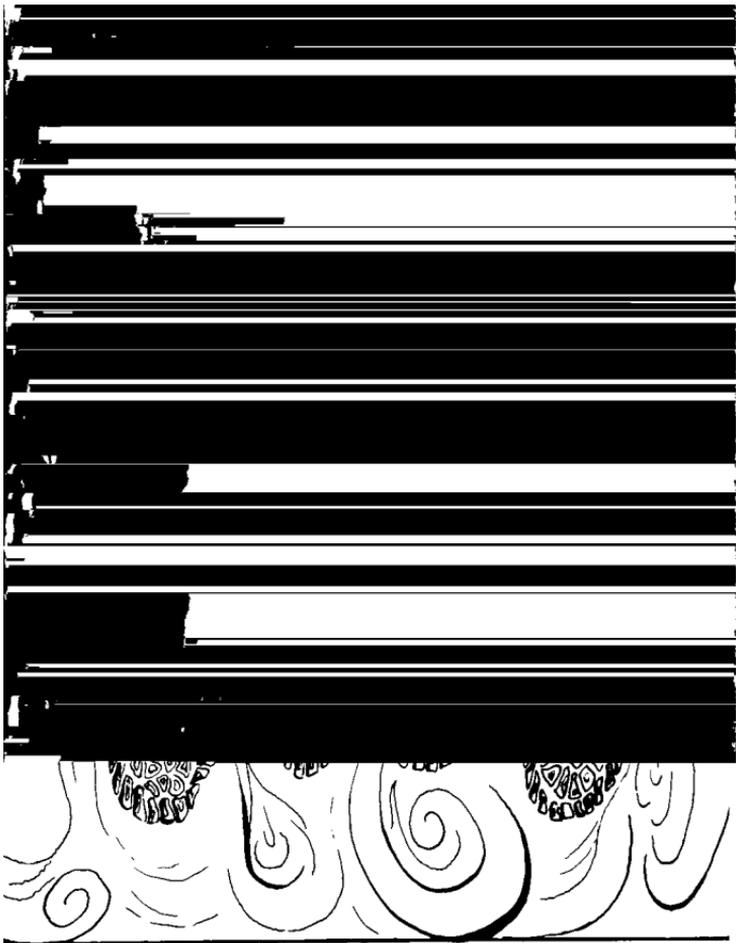
#### **BETA HEMOLYTIC STREPTOCOCCUS** (bay'-ta he-mo-lit'-ik strep-toe-kok'-kus)

Beta hemolytic streptococcus is commonly called "*strep.*"

### **Types of Bacterial Skin Infections**

#### **IMPETIGO** (im-pe-tie'-go)

Impetigo is a bacterial infection caused by staph or strep, or by a combination of both.

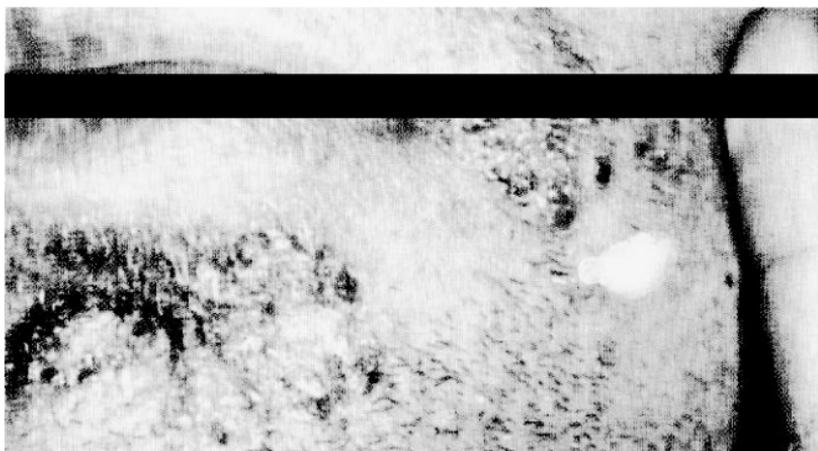


Impetigo.

Impetigo is limited to the stratum corneum and epidermis. Therefore, it heals without scarring. It may leave a reddish or brownish mark which disappears in several weeks.

It begins suddenly, (within a few hours) on the face, neck, arms, or legs. There may be one or dozens of lesions which itch and burn a little, and are mildly tender to the touch. The lesions may be vesicles, pustules, bullas (up to 3 inches (8 centimeters) in size), raw glistening spots, or cracks in the skin. Initially, the skin surrounding the lesion looks normal, but within a day or so, a red ring develops. In addition, a soft, soggy, yellow or honey-colored crust forms.

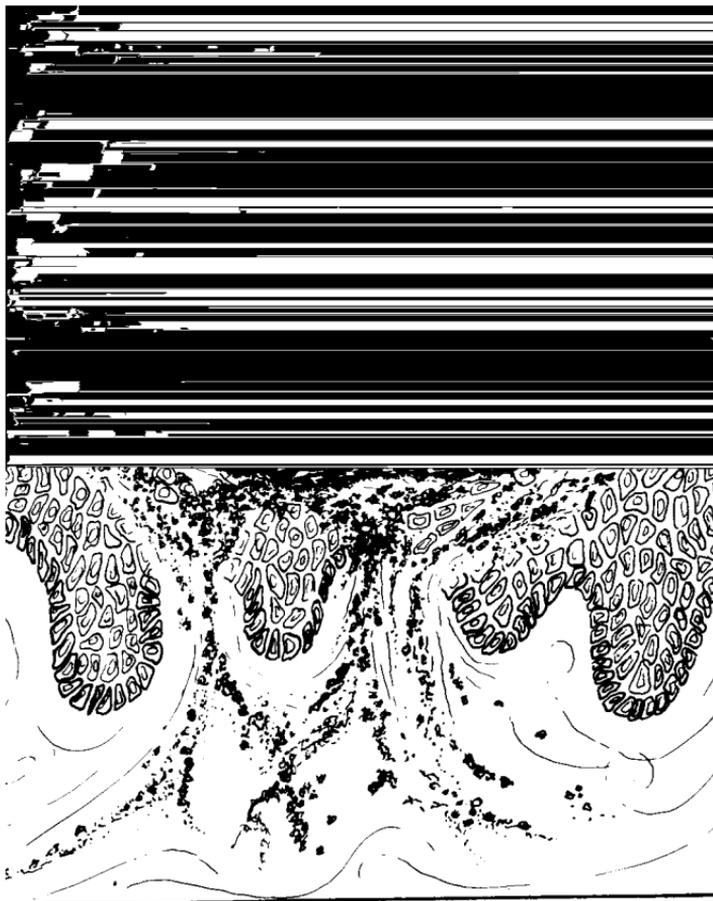
Often, impetigo begins without any preceding skin infection. Sometimes, however, there may be an infected fever blister, hangnail, insect bite, cut, or burn, present at the same site or elsewhere on the body, which serves as the source of infection.



**Impetigo (lesions on finger and face).**

## ECTHYMA (ek-thi'-ma)

Ecthymas are infections characterized by a hard, difficult to remove, brown or black crust.



Ecthyma.



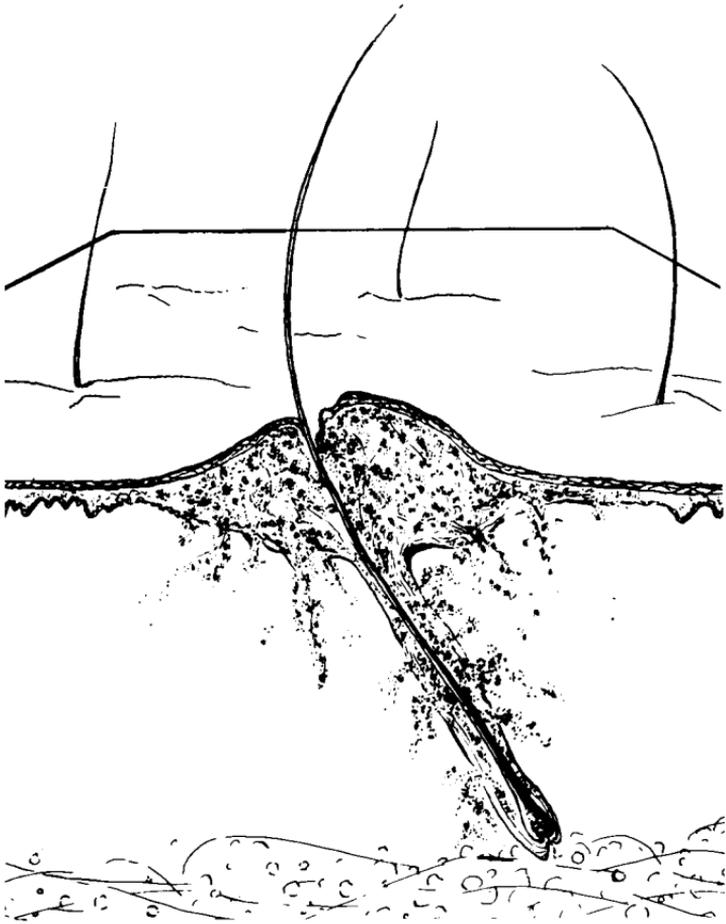
**Ecthyma following insect bite and scratch.**

An ecthyma is painful if it is squeezed, or if pressure is applied. In addition, bleeding from the raw base and pain from the remaining ulcer may result, if the crust is removed. This type of infection invades the dermis and therefore heals with a scar.



## **FOLLICULITIS (fo-lik-u-lie'-tis)**

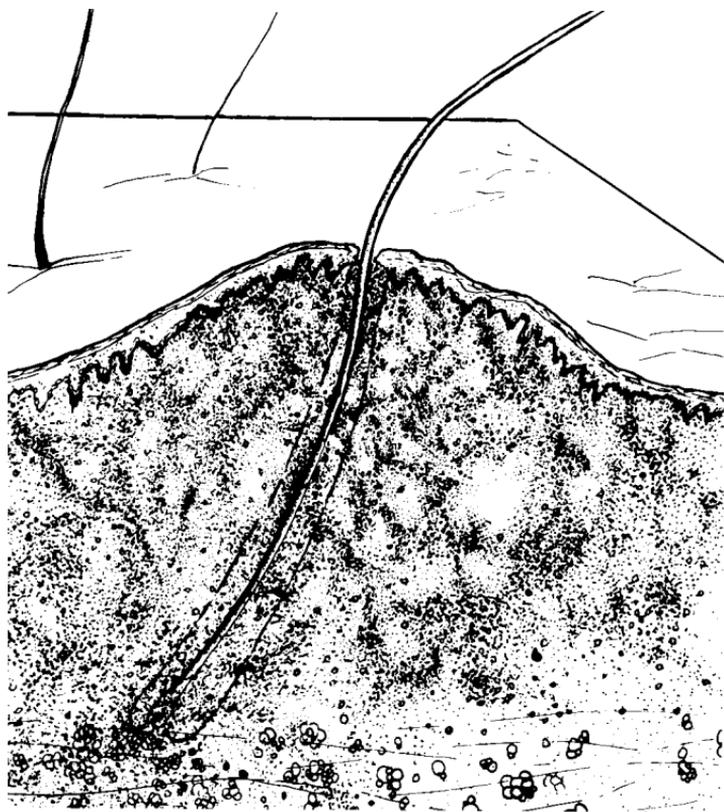
Folliculitis is limited to the hair follicle. The follicle is small and slightly tender and contains pus. Although usually due to bacteria, folliculitis can be caused by fungi and chemicals.



Folliculitis.

## FURUNCLE (f'ur'-ung-kl)

A furuncle or boil is an infection of the hair follicle and tissue around it.



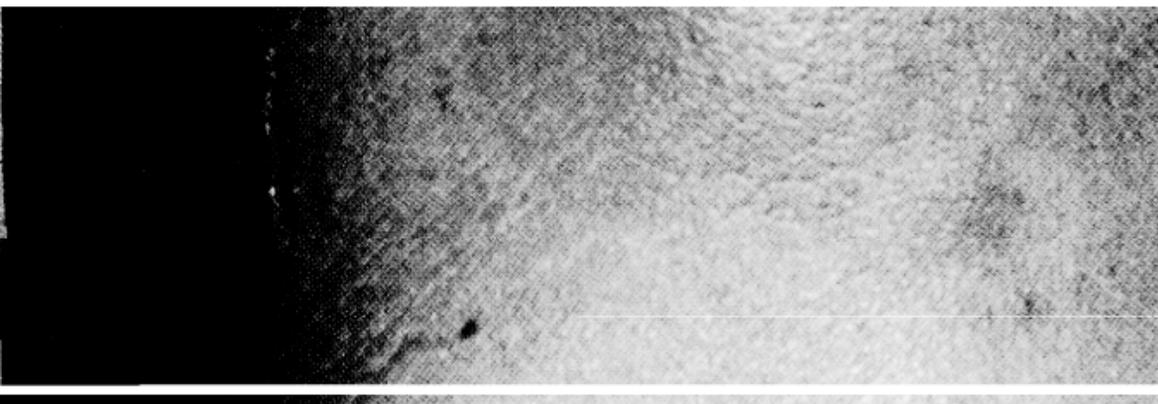
Furuncle.

It is characterized by redness and pain. At first, a red, tender lump appears, but in a few days a yellow “head” develops.

[Click here for](#)

Ripe furuncle (boil) on neck.

When a furuncle opens, pus, blood, and a plug of dead tissue (core) come out. If the furuncle is small, it heals with no visible scar.



Ripe furuncle (boil) on neck.

## **CELLULITIS**

**(when used to describe a skin infection)**

Cellulitis is a diffuse, inflammatory infection involving all layers of the skin. It can form around ecthymas or furuncles, be seen with fungal infections, or occur by itself.

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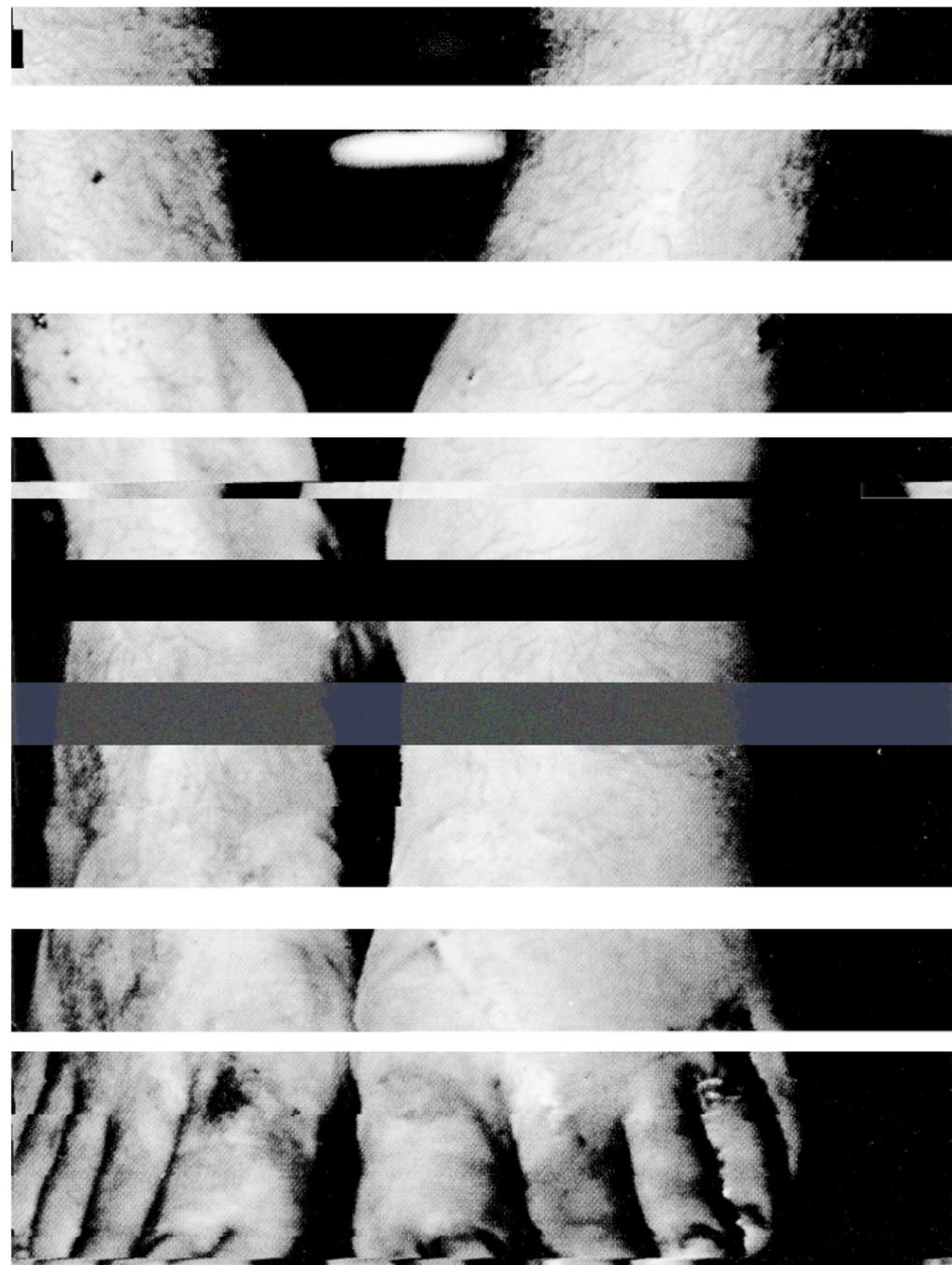
Cellutis following insect bite.



Cellulitis following insect bite.

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Cellulitis (note swelling of one foot and ankle)



**Cellulitis (note swelling of one foot and ankle).**

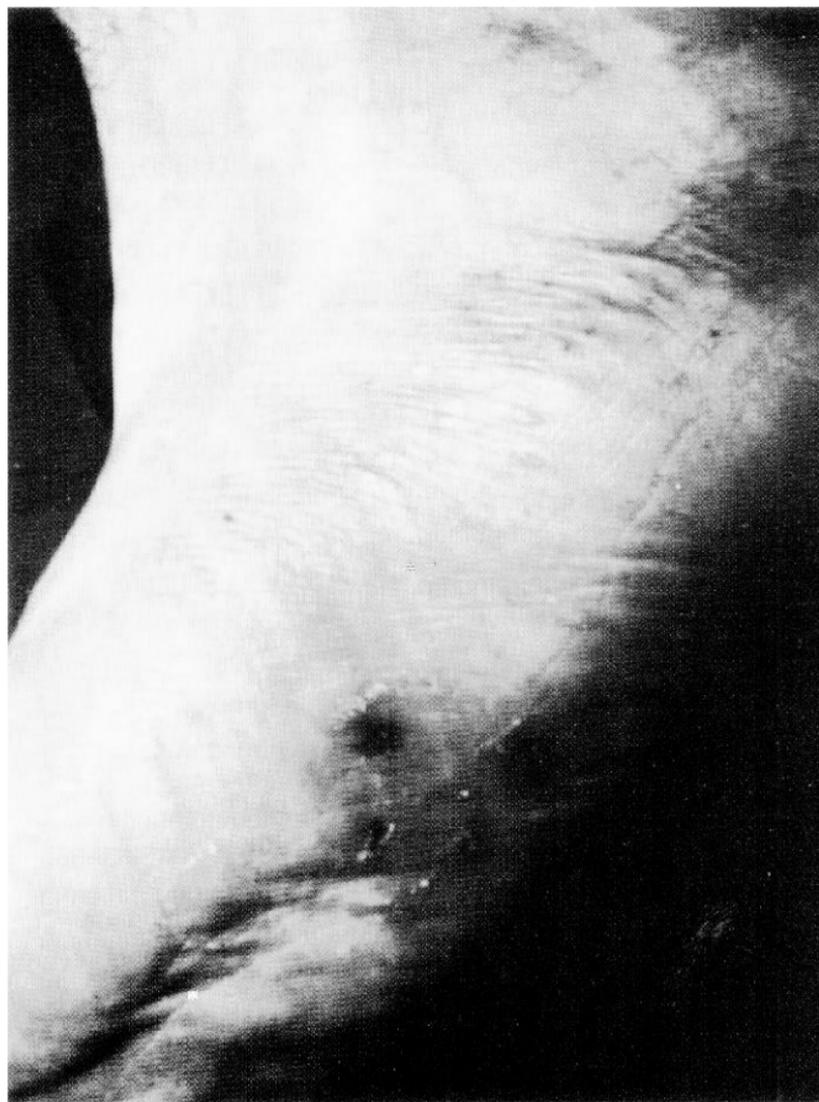
## **SECONDARY BACTERIAL INFECTIONS OF THE SKIN**

A secondary bacterial infection of the skin occurs when a preceding skin lesion has become infected with bacteria. The skin lesion may be a cut, scratch, bite, burn, abrasion, wound, cold sore (fever blister), or a generalized dermatitis. Many types of bacteria cause the infection, the most common being staphylococci and streptococci. Some skin lesions readily become secondarily infected, others seldom do.

### **LYMPHANGITIS (lymph-an-gi'-tis)**

Lymphangitis is an infection caused by streptococci. It is identified by the red streaks under the skin of a leg or arm which travel along the lymph vessel pathways from an ecthyma, a cellulitis, or another type of infected skin lesion.

Symptoms of lymphangitis include fever, chills, swelling, and tenderness of the regional lymph glands (nodes) that drain the affected extremity.



Lymphangitis (note red streaks going up foot and ankle).

# Treatment of Bacterial Skin Infections

## TOPICAL TREATMENT

The crusts of impetigo and ecthymas prevent healing and insure the spread of the infection. They protect the bacteria which multiply underneath. Chemicals released by the bacteria kill more of the dermis thus giving the bacteria more food. Pus accumulates and the infection spreads. In addition, the crusts act like a wall to keep the edges of the wound apart. They also prevent externally applied antibacterial medicine from destroying the bacteria. Therefore, topical treatment of impetigo, ecthymas, and ulcers mandates that you *take the crust off and keep it off. Then, rub in antibacterial cream (Rx No. 3), gently but thoroughly.*

Because impetigo crusts will initially reform in 2 to 4 hours, topically treat impetigo the first day, five or six times. You can then treat it the second day, four times and the third day two or three times. It is usually healing by the fourth day. An ecthyma crust, on the other hand, usually reforms in 6 to 8 to 12 hours. Topically treat ecthymas two to three times daily. They usually heal within 8 to 14 days.

## ***Remove the crust***

When removing an impetigo crust:

Cleanse the lesion with water and soap or surgical detergent.

Do not be concerned if there is some bleeding when the crust comes off.

When removing an ecthyma crust:

Soak the area in water and soap or surgical detergent for 10 to 20 minutes.

If the crust fails to come off, use a number 15 to 20 disposable knife blade around the edge, between the crust and the skin. *Do not cut the crust off, but rather pry and scrape it off.*

*Make sure the crust comes off all the way even though the patient may complain of pain and the ecthyma bleeds.*

## ***Prevent the spread of infection***

Staphylococcal and streptococcal infections can be transferred from an initial lesion to other parts of the body.

Have patients wash their hands and clean under their fingernails with soap and water several times a day, especially after each treatment.

## **TREATMENT BY THE BATTALION SURGEON**

### ***Whenever you observe***

more than three lesions of impetigo,

more than two ecthymas,

several lesions of folliculitis that are painful,

any cellulitis,

any lymphangitis,

**Make Sure** the patient is seen quickly by the **Battalion Surgeon**. A systemic antibiotic, such as penicillin, tetracycline, or erythromycin, may be prescribed.