

DRUGS USED FOR THE TREATMENT OF SYPHILIS & GONORRHEA





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OBJECTIVES

- At the end of lecture, the students should :
- List the drugs used in the treatment of syphilis & gonorrhoea.
- Describe the mechanism of action and adverse effects of each drug





OBJECTIVES (continue)

- Describe the contraindications of drugs used
- Describe the recommended regimens used for treatment of syphilis & gonorrhoea
- Know the alternative treatments in allergic patients



SYPHILIS

What is Syphilis?

- Sexually transmitted disease caused by bacterium **Treponema Pallidum**

Stages Of Syphilis

- **Primary stage (a chancre)**



Secondary Stage

- **Skin rash & mucous membranes lesions**



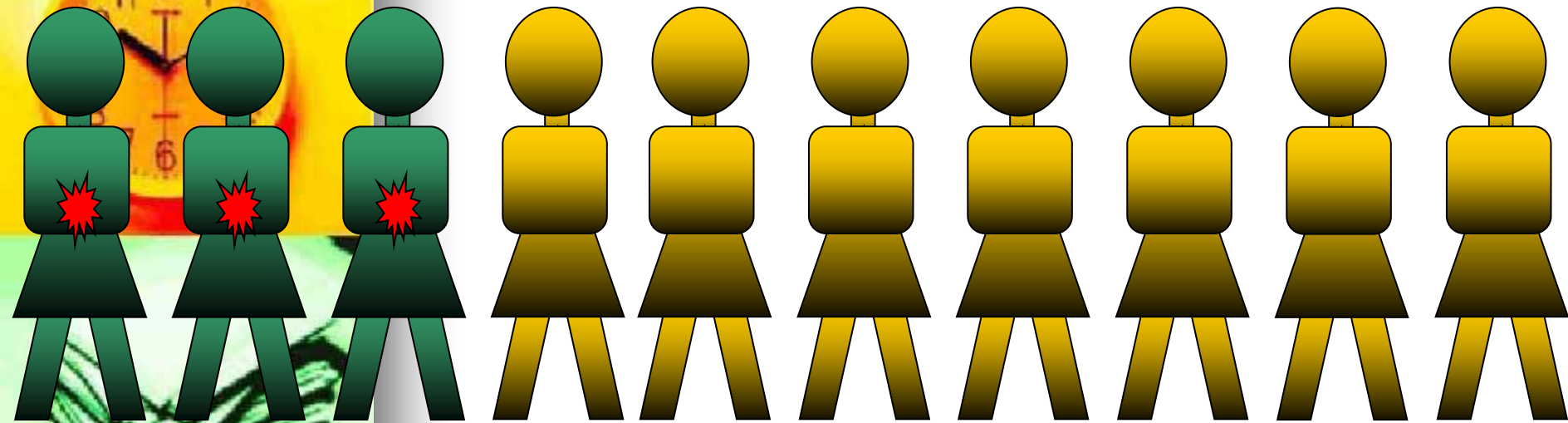
Secondary Syphilis: Palmar/Plantar Rash



Source: CDC/NCHSTP/Division of STD
Prevention, STD Clinical Slides

Source: Seattle STD/HIV Prevention
Training Center at the University of
Washington, UW HSCER Slide Bank

Third Stage(Latent stage)



70% may have NO SYMPTOMS



Drugs used in the treatment of Syphilis

- **Penicillins*****

 - Penicillin G**

 - Benzathin P. ; Procaine P.**

- **Tetracyclines**

 - Doxycycline**

- **Macrolides**

 - Azithromycin**

- **Cephalosporins**

 - Ceftriaxone**

PENICILLINS

- Mechanism of action
- Inhibit the synthesis of bacterial cell wall .

These drugs are bactericidal





Preparations of penicillins used for the treatment of syphilis

- **Penicillin G, i.v**(Short duration of action)
- **Procaine P, i.m** (Long acting(24-48hrs)
- **Benzathine P, i.m**(Long acting(every 3-4 weeks)

All are:

Acid unstable

Penicillinase sensitive



Adverse effects of penicillins

- **Hypersensitivity**
- **Convulsions with high doses or in renal failure**
- **Super infections**



Drugs used in Allergic Patients To Penicillins

- **Tetracyclines such as:**
Doxycycline
- **Macrolides such as:**
Azithromycin
- **Cephalosprins such as :**
Ceftriaxone
cefixime



TETRACYCLINES

e.g, Doxycycline
(100mg BD for 14 days)

- Well absorbed orally
- Long-acting

Mechanism of action

- **Inhibit bacterial protein synthesis by reversibly binding to 30 S bacterial ribosomal subunits .**



Side effects

1. nausea, vomiting ,diarrhea & epigastric pain(give with food)
2. Hepatic toxicity (prolonged therapy with high dose)
3. Brown discolouration of teeth – children
4. Deformity or growth inhibition of bones – children
5. Phototoxicity
6. Vertigo
7. Superinfections.



Contraindications

- Pregnancy
- Breast feeding
- Children(below 10 yrs)





MACROLIDES

e.g., Azithromycin

Mechanism of action

- **Inhibits bacterial protein synthesis by binding to bacterial 50S ribosomal subunits**



Pharmacokinetics

- Acid stable
- Penetrates into most tissues except CSF
- $T_{1/2}$ 2-4 days
- Once daily dose
- Should be given 1 hour before or 2 hours after meals
- No effect on cytochrome P450

Side Effects

Nausea, vomiting, abdominal pain
& diarrhea.

Allergic reactions- urticaria, mild
skin rashes.



Cephalosporins

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graph TD; A[Cephalosporins] --> B["β-lactam antibiotics<br/>3rd Generation cephalosporins<br/>e.g. Ceftriaxone(i.m.)"]; A --> C["Mechanism of action<br/>Inhibits bacterial cell wall synthesis<br/>Bactericidal"];
```

β-lactam antibiotics

3rd Generation cephalosporins

e.g. Ceftriaxone(i.m.)

Mechanism of action

Inhibits bacterial cell wall synthesis

Bactericidal



Adverse effects

- Allergic manifestations
- Thrombophilic
- Superinfection
- Diarrhea

Early syphilis

WHO GUIDELINES FOR THE Treatment of *Treponema pallidum* (syphilis)

Adults
(primary,
secondary and
early latent
syphilis of not
more than two
years' duration)

benzathine penicillin G
2.4 million units once I.M.

procaine penicillin G
1.2 million units I.M. for 10–14 days
If penicillin is not allowed due to allergy, use

Doxycycline 100 mg twice daily orally for 14 days or
Ceftriaxone 1 g IM once daily for 10–14 days or,
Azithromycin 2 g once orally.

Pregnant woman

benzathine penicillin G
2.4 million units once I.M.

procaine penicillin G
1.2 million units I.M. for 10–14 days
If penicillin is not allowed due to allergy, use
Ceftriaxone 1 g IM once daily for 10–14 days or,
Azithromycin 2 g once orally.

Late syphilis

WHO GUIDELINES FOR THE Treatment of *Treponema pallidum* (syphilis)

Adults

(infection of more than two years' duration without evidence of treponemal infection)

benzathine penicillin G

2.4 million units nits I.M. once weekly for three consecutive weeks.

procaine penicillin G

1.2 million units I.M. for 20 days

If penicillin is not allowed due to allergy, use

Doxycycline 100 mg twice daily orally for 30 days or

Pregnant woman

benzathine penicillin G

2.4 million units nits I.M. once weekly for three consecutive weeks.

procaine penicillin G

1.2 million units I.M. for 20 days

If penicillin is not allowed due to allergy, use

Penicillin desensitization

Erythromycin 500 mg orally four times daily for 30 days

Ceftriaxone 1 g IM once daily for 10–14 days or,

Azithromycin 2 g once orally.

Congenital syphilis

WHO GUIDELINES FOR THE Treatment of *Treponema pallidum* (syphilis)

In infants with confirmed congenital syphilis or infants who are clinically normal, but whose mothers had untreated syphilis

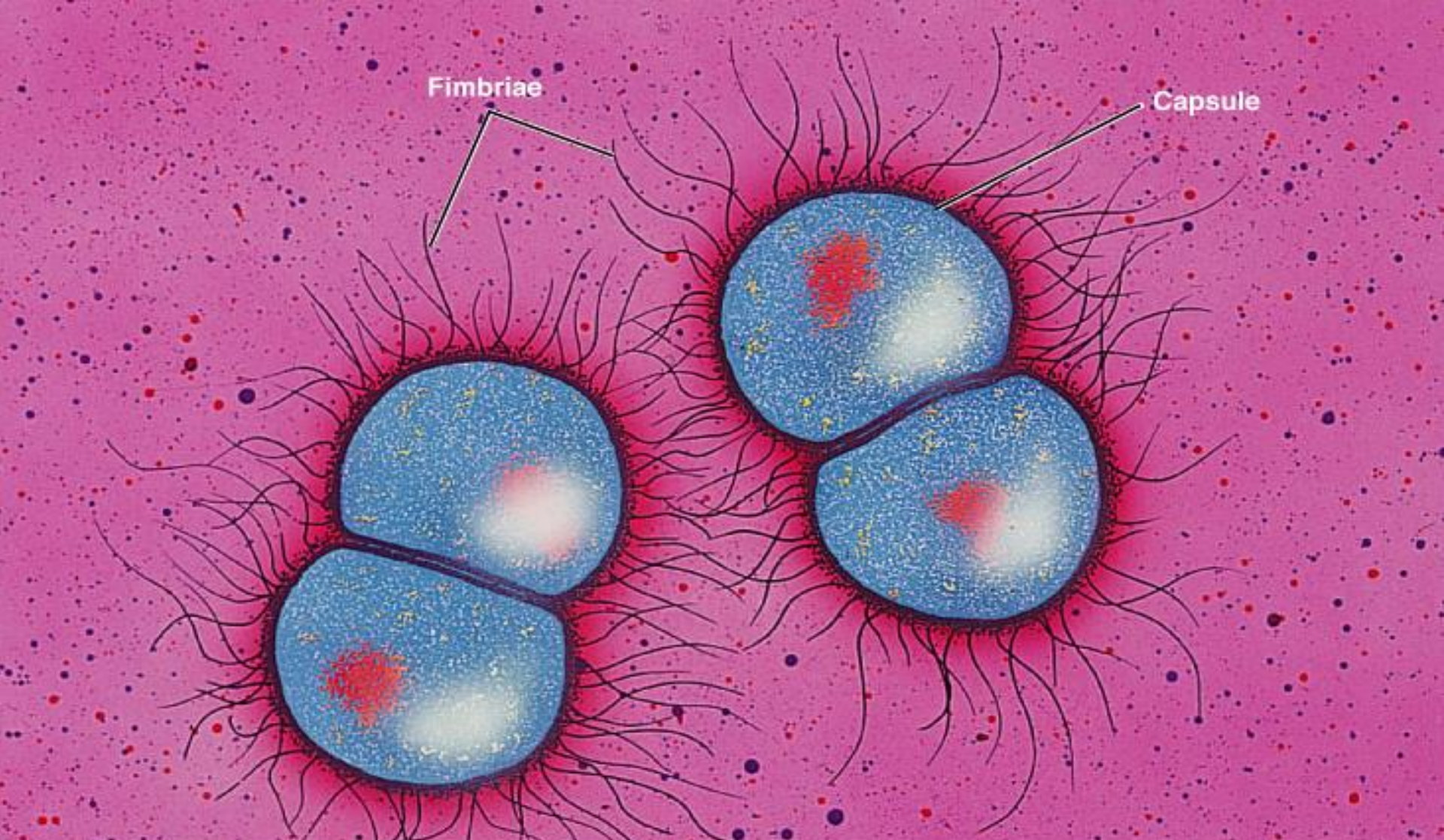
Aqueous benzyl penicillin (I.V.)
100 000–150 000 U/kg/day for 10–15 days

or

Procaine penicillin (I.M.)
50 000 U/kg/day single dose for 10–15 days




GONORRHEA

Caused by *Neisseria gonorrhoea*, a pus producing bacteria





Drugs used in the treatment of Gonorrhoea

- **3rd generation Cephalosporins^{***}**
Ceftriaxone, I.M.
 - **Fluoroquinolones^{**}**
Ciprofloxacin
 - **Spectinomycin**
- 
- 
- 



**: Recommended regimens
(1st line treatment)**




**Uncomplicated gonorrheal
infections**


3rd generation cephalosporins

500mg ceftriaxone, I.M. OR

400mg cefixime, p.o.



**Typically given with a single dose of (100 mg
azithromycin(1gm,p.o) or doxycycline
BD,p.O.) for 7 days(chlamydia trachomatis).**



FLUOROQUINOLONES

Single oral dose of :

**Ciprofloxacin(500 mg) OR
Ofloxacin(400 mg)**



MECHANISM OF ACTION of fluoroquinolones

- **All are bactericidal**
- **Inhibit DNA synthesis by inhibiting DNA gyrase enzyme(required for DNA supercoiling).**



Side effects

**Nausea , vomiting & diarrhoea
Headache & dizziness**

**May damage growing cartilage
& cause arthropathy.**

**Phototoxicity – avoid excessive
sunlight**





CONTRAINDICATIONS

- **Pregnancy**
- **Nursing mothers**
- **Children under 18 years**



Alternative treatment in pts cannot tolerate or be treated with cephalosporins or quinolones

Spectinomycin

- **2g ,IM**



Mechanism of action

- **Inhibits protein synthesis by binding to 30 S ribosomal subunits**

Adverse Effects



```
graph TD; A[Adverse Effects] --> B[1. Pain at the site of injection]; A --> C[2. Fever  
Nausea]; A --> D[Nephrotoxicity  
(not common)];
```

1. Pain at the site of injection

**2. Fever
Nausea**

**Nephrotoxicity
(not common)**



CONTINUE

Complicated gonorrhoeal infections

Spread through blood stream

- **EYE**
- **Joints**
- **Heart valves**
- **Brain**

Harmful effects of gonorrhoea

Newborn eye infections, may lead to conjunctivitis, known as ophthalmia neonatorum, and blindness, if not treated.







Treatment of Complicated infections

- With **conjunctivitis** in new born

Silver nitrate 1% solution

Germicidal effects are due to precipitation of bacterial proteins by liberated silver ions.

Put into conjunctival sac once immediately after birth (no later than 1 h after birth).



ERYTHROMYCIN

- **0.5% ointment for treatment & prevention of corneal & conjunctival infections.**
- **Put into conjunctival sac immediately after birth (no later than 1 hr after delivery)**

WHO Guidelines For ocular prophylaxis in newborns

- **WHO guidelines** suggest one of the following options for topical application to both eyes immediately after birth:
- Silver nitrate 1% solution or
- Tetracycline hydrochloride 1% eye ointment or
- Erythromycin 0.5% eye ointment or
- Povidone iodine 2.5% solution (water-based) or
- Chloramphenicol 1% eye ointment

