

ANTIMICROBIALS



TETRACYCLINES

BACTERIOSTATIC

ANTIMICROBIALS

TETRACYCLINES

Tetracycline

Oxytetracycline

Chlortetracycline

Doxycycline



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Tetracyclines - Mechanism of Action

Inhibit aminoacyl-transfer-RNA
binding to 30S ribosomal subunit-
mRNA

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Tetracyclines - Pharmacokinetics

Amphoteric- improves distribution

Lipid soluble - well distributed (+ milk)

Bioavailability - about 50% of oral dose

Liver metabolism & enterohepatic circulation

- tetracycline, oxytetracycline urine/bile
- Doxycycline - bile and faecal elimination

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Tetracyclines

Chelated by divalent cations (Ca^{+2})

Penicillins and tetracyclines are antagonistic!!!
(except uterine boluses)

Intramuscular - irritating, painful Polyvinyl
pyrrolidone (PVP) causes less injury and
pain at IM site \$\$

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Tetracyclines - toxicity

GIT- fatal enterocolitis/horse

- Diarrhoea, superinfections
- Pseudomembranous colitis

Vitamin B deficiency

Yellow teeth and bones (antianabolic)

Contraindicated in pregnant animals

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Tetracyclines - toxicity

Bitter - salivation

Cardiovascular collapse (IV)

Drug fever, rashes, photosensitivity

"Fanconi-like" syndrome (out of date)

Inhibit hepatic metabolism

Nephrotoxicity with large overdose

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Tetracyclines - Spectrum of Activity

Broad spectrum antibiotics

Gram + and Gram -

Mycoplasma, Rickettsia

Chlamydia, protozoa

Tetracyclines

Gram Positive Bacteria

Staphylococcus, Strep, Clostridium

Listeria monocytogenes,

Anaerobes

Some efficacy but not first choice

Gram Negative Bacteria

Some efficacy – especially doxycycline e.g. Bordetella, Brucella, Pasteurella, Shigella

Actinobacillus ligniersi, Moraxella

Other susceptible:

Haemobartonella felis

Mycoplasma, Chlamydia

Leptospira - doxycycline

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TETRACYCLINES - USES

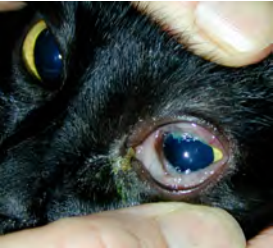
- Broad spectrum in activity but resistance limits use
- Pneumonia
- Uterine boluses
- footrot
- leptospirosis (doxycycline)
- black leg



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TETRACYCLINES - USES

- chlamydia (*Chlamydia felis* in cats)



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Chloramphenicol & Florfenicol

Bacteriostatic

Activity (similar to tetracyclines):

Gram + / gram - (not *Pseudomonas*)

Rickettsia

Chlamydia (not DoC for *C felis* in cat)

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Chloramphenicol - Pharmacokinetics

Highly lipid soluble (penetrates eye)

Bioavailability 100%

Excreted primarily in the urine

Accumulation in cat plasma

due to poor ability to glucuronidate

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Chloramphenicol

Toxicity

Associated with aplastic anaemia

Banned in food producing animals

Warn owners if dispensing

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Chloramphenicol

USES

Topical eye treatment for chlamydia

Good penetration to the eye & CNS

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Florfenicol

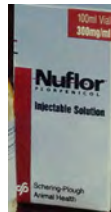
Adverse effects - associated with
testicular atrophy in bulls

USES:

Respiratory diseases of cattle

Pink eye

Foot rot



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Macrolides

Bacterostatic

Inhibit Protein Synthesis

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MACROLIDES

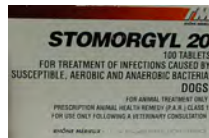
- ◆ erythromycin
- ◆ azithromycin
- ◆ tylosin



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MACROLIDES

- ◆ tilmicosin*
 - ◆ *toxic to humans
- ◆ spiramycin



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MACROLIDES

- ◆ Bacteriostatic at usual doses
- ◆ Distributes well to most tissues
- ◆ Food interferes with oral use
- ◆ Liver metabolism
- ◆ Biliary excretion - primary
- ◆ Increased GIT motility (erythro)

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MACROLIDES - Toxicity

- ◆ Muscle paralysis with anaesthetics
- ◆ FATAL DIARRHOEA!!
 - ◆ Horses and small mammals
- ◆ Cardiac effects
 - ◆ Horses, pig and primates
- ◆ IM injections are painful

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Macrolides and Lincosamides

Narrow spectrum Gram +

BUT ALSO:

Pasteurella

Bacteroides

Mycoplasma

Rickettsia

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MACROLIDES - USES

- ◆ Small animal:
 - ◆ Campylobacter infections
 - ◆ Staphylococcus alternative
 - ◆ Mycoplasma pneumonia
- ◆ Tend to cause GI upset - erythromycin

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MACROLIDES - USES

- ◆ Foals - Rhodococcus infections
- ◆ Large animal:
 - ◆ Pneumonia
 - ◆ Footrot
 - ◆ Mastitis
- ◆ Where bacteria are resistant to other antibiotics

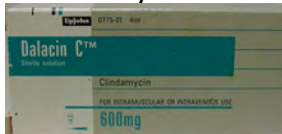
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LINCOSAMIDES

Bacterostatic

- ◆ Clindamycin

- ◆ Lincomycin



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Lincosamides

Toxicity

Reactions at injection sites

GIT upset (do not use in horses or small mammals)

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Lincosamides

Pharmacokinetics:

Basic drugs

Poor bioavailability (PO)

Good distribution

Enterohepatic circulation

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LINCOSAMIDES

- ◆ Biotransformed by liver
- ◆ Half life is increased by liver and/or kidney disease

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LINCOSAMIDES

- ◆ Excellent penetration into abscesses
- ◆ Upper respiratory tract infections
- ◆ Osteomyelitis
- ◆ Deep pyodermas

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Macrolides and Lincosamides

USES:

Pyodermas

Pasteurellosis

Respiratory infections in pigs

Osteomyelitis

Clindamycin - toxoplasmosis

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Tetracyclines, Chloramphenicol, Macrolides and Lincosamides

SUMMARY

Spectrum of Activity

Adverse reactions/toxicity

Uses

