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**PHARMACOLOGY ASSIGNMENT**

A named bacterial protein synthesis inhibitors(**CHLORAMPHENICOL**)

**Chloramphenicol** is an antibiotic  useful for the treatment of a number of infection. This includes use as an eye ointment to treat conjuntivitis By mouth or by injection, it is used to treat meningtis, plague , cholera, and typhoid fever Its use by mouth or by injection is only recommended when safer antibiotics cannot be used Monitoring both blood levels of the medication and blood cell levels every two days is recommended during treatment., Common side effects include bone marrow suppression , nausea, and diarrhea The bone marrow suppression may result in death. Chloramphenicol is a broad spectrum antibiotics that typically stops bacterial growth by stopping the production of proteins.

Chloramphenicol was discovered after being isolated from *streptomyces*  venezuelae in1947 Its chemical structure was identified and it was first artificially made in 1949, making it the first antibiotic to be made instead of extracted from a micro-organism.

**MODE OF ACTION**

Chloramphenicol is a bacteriostatic by inhibiting protein synthesis. It prevents protein chain by inhibiting the peptidyl transferase activity of the bacterial ribosome. It specifically binds to A2451 and A2452 residues in the 23S rRNA of the 50S ribosomal subunit, preventing peptide bond formation. Chloramphenicol directly interferes with substrate binding in the ribosome, as compared to macrolides, which sterically block the progression of the growing peptide.

**ADVERSE EFFECTS**

### Aplastic anemia

The most serious side effect of chloramphenicol treatment is aplastic anaemia. This effect is rare and sometimes fatal. The risk of AA is high enough that alternatives should be strongly considered. Treatments are available but expensive. No way exists to predict who may or may not get this side effect. The effect usually occurs weeks or months after treatment has been stopped, and a genetic predisposition may be involved.

### Bone marrow suppression

Chloramphenicol may cause bone marrow suppression  during treatment; this is a direct toxic effect of the drug on human mitochondria . This effect manifests first as a fall in hemoglobin levels, which occurs quite predictably once a cumulative dose of 20 g has been given. The anaemia is fully reversible once the drug is stopped and does not predict future development of aplastic anaemia. Studies in mice have suggested existing marrow damage may compound any marrow damage resulting from the toxic effects of chloramphenicol.

### Hypersensitivity reactions.

Fever, macular and vesicular rashes, angioedema, urticaria, and anaphylaxis may occur. Herxheimer's reactions have occurred during therapy for typhoid fever.

**INDICATION FOR USE**

The original indication of chloramphenicol was in the treatment of typhiod, but the now almost universal presence of multiple drug-resistant *salmonella typhi*  has meant it is seldom used for this indication except when the organism is known to be sensitive.

Chloramphenicol has a broad spectrum of activity and has been effective in treating ocular infections such as conjunctivitis, blepharitis etc. caused by a number of bacteria including *Staphylococcus aureus, Streptococcus pneumoniae*, and *Escherichia coli*.

[]](https://en.m.wikipedia.org/wiki/Chloramphenicol#cite_note-54) It is currently considered the most useful treatment of chlamydial disease in koalas

Chloramphenicol increases the absorption of iron

**TOXICITY**

Toxic manifestations of chloramphenicol may be explained by attack by free radicals. Depletion in compounds acting as cellular antioxidants, such as glutathione and vitamin E, may conceivably increase the vulnerability of an individual to chloramphenicol toxicity, while supplementation with an antioxidant might protect against it. , it shows severe toxicity in the form of Aplastic anemia (AA) and bone marrow suppression. Its D – form is the toxic one and inhibits protein synthesis. In living system, CAP is hydrolyzed and absorbed completely. Its excretion is also at a high rate but is highly impaired in disorders associate liver and kidneys. It is metabolized in liver to Chloramphenicol glucuronide. Being highly toxic, it is still prescribed at a noticeable rate. It is recommended to be prescribed to be only when there is no other alternative is present with a monitoring of its concentration in patients body. Serious and fatal blood dyscrasias, including aplastic anemia, hypoplastic anemia, thrombocytopenia, and granulocytopenia, have occurred after short-term and prolonged therapy,monitor CBC frequently in all patients. Use only in serious infections, do not use oral or topical; not for use in trivial infections or for prophylaxis,Avoid during breastfeeding.