Esercizio 1

Descrizione problema

Il PDF in allegato contiene un sottoinsieme di farmaci che potrebbero avere un impatto sulla funzionalità renale dei pazienti.

A partire dal PDF, estrarre per ogni farmaco le seguenti sezioni:
- *Clinical Use*
- *Dose in normal renal function*
- *Dose in renal impairment GFR (mL/min)*
- *Administration*

Chloroquine 201

Chloroquine

Clinical use
- Treatment and prophylaxis of malaria
- Discoid and systemic lupus erythematosus
- Rheumatoid arthritis

Dose in normal renal function
- Orally.
- Malaria treatment: 600 mg, followed by 300 mg 6–8 hours later, then 300 mg/day for 2 days.
- Malaria prophylaxis: 300 mg once a week on the same day each week (start 1 week before exposure to risk and continue until 4 weeks after leaving the malarial area).
- SLE: 150 mg daily.
- Rheumatoid arthritis: 150 mg daily; maximum 2.5 mg/kg

Pharmacokinetics

Molecular weight (daltons)	319.9 (515.9 as phosphate), (436 as sulphate)
% Protein binding	50–70
% Excreted unchanged in urine	42–47
Volume of distribution (L/kg)	>100
Half-life — normal/ESRF (hrs)	10–60 days / 5–50 days

Metabolism

Chloroquine is extensively metabolised in the liver, mainly to monodesethylchloroquine with smaller amounts of bisdesethylchloroquine (didesethylchloroquinine) and other metabolites being formed. Monodesethylchloroquine has been reported to have some activity against *Plasmodium falciparum*. Chloroquine and its metabolites are excreted in the urine, with about half of a dose appearing as unchanged drug and about 10% as the monodesethyl metabolite. Chloroquine may be detected in urine for several months.

Dose in renal impairment GFR (mL/min)

20–50	Dose as in normal renal function.
10–20	Dose as in normal renal function.
<10	50% of normal dose.

Dose in patients undergoing renal replacement therapies

APD/CAPD	Not dialysed. Dose as in GFR<10 mL/min.
HD	Not dialysed. Dose as in GFR<10 mL/min.
HDF/High flux	Unknown dialysability. Dose as in GFR<10 mL/min.
CAV/VVHD	Not dialysed. Dose as in normal renal function.

Important drug interactions

Potentially hazardous interactions with other drugs
- Anti-arrhythmics: increased risk of ventricular arrhythmias with amiodarone – avoid.
- Antibacterials: increased risk of ventricular arrhythmias with moxifloxacin – avoid; concentration of praziquantel reduced – consider increasing praziquantel dose.
- Anti-depressants: possible increased risk of ventricular arrhythmias with citalopram and escitalopram.
- Antiepileptics: antagonism of anticonvulsant effect.
- Antimalarials: increased risk of convulsions with mefloquine; avoid with artemether/lumefantrine.
- Antipsychotics: increased risk of ventricular arrhythmias with droperidol – avoid.
- Ciclosporin: increases ciclosporin concentration – increased risk of toxicity.
- Cytotoxics: possible increased risk of ventricular arrhythmias with bosutinib, ceritinib and panobinostat.
- Digoxin: possibly increased concentration of digoxin.
- Lanthanum: absorption possibly reduced by lanthanum, give at least 2 hours apart.

Administration

Reconstitution
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Route
- Oral, IV, IM/SC in rare cases

Rate of administration
- IV infusion: Administer dose of 10 mg/kg of chloroquine base in sodium chloride 0.9% by slow IV infusion over 8 hours followed by 3 further 8 hour infusions containing 5 mg base/kg (total dose 25 mg base/kg over 32 hours).

Il contenuto di tali sezioni deve essere riportato in un foglio Excel aventi le seguenti colonne:
- Clinical Use
- Dose in normal renal function
- Dose in renal impairment GFR (mL/min)
- Administration

Aggiungere un ulteriore colonna (*Modified Dose based on GFR*) booleana (1/0) che indica se la dose del farmaco viene modificata per almeno un range di GFR indicati nella sezione *Dose in renal impairment GFR (mL/min).*

Esempio:

Il farmaco **Chloroquine** prevede che per un GFR < 10, la dose indicata equivale al 50% di quella normale. In questo caso, nella colonna *Modified Dose based on GFR* dovrà essere indicato 1.

Deliverable:

Per lo svolgimento dell'esercizio è richiesto l'utilizzo di **Python** come linguaggio di programmazione. Utilizzare le librerie che si ritengono più opportune per risolvere il problema.

Fornire il codice usando un repository **Github** pubblico.