CLINICAL GUIDELINES ID TAG	
Title:	Digoxin protocol (Adults)
Author:	DR M CONNOLLY
Speciality / Division:	CARDIOLOGY
Directorate:	MEDCIAL
Date Uploaded:	29th August 2023
Review Date	Initial: 29th August 2026 Extended: 1ST JAN 2027
Clinical Guideline ID	CG0824[1]

Digoxin protocol (Adults)

Indication:

- Digoxin is a drug mainly indicated for rate control in atrial fibrillation or atrial flutter
- Occasionally it can also be used in cardiac failure treatment

Mode of action:

- Digoxin is a cardiac glycoside that increases the force of myocardial contraction and reduces conductivity within the atrioventricular (AV) node
- Digoxin inhibits sodium-potassium ATPase. This increases intracellular sodium and thus (by stimulation of sodium-calcium exchange) an increase in the intracellular concentration of calcium
- The beneficial effects of digoxin result from direct actions on cardiac muscle, as well as indirect actions on the cardiovascular system mediated by effects on the autonomic nervous system

Contraindications:

- Hypertrophic cardiomyopathy
- Hypersensitivity/allergy
- Intermittent heart block
- Second/third degree heart block
- Sick Sinus Syndrome
- Myocarditis
- Wolff-Parkinson-White syndrome (accessory pathways)
- Ventricular tachycardia

Cautions:

- Significant renal impairment
- Hypercalcaemia (risk of digitalis toxicity)
- Hypokalaemia (risk of digitalis toxicity)
- Hypomagnesaemia (risk of digitalis toxicity)
- Certain interacting medicines (such as amiodarone which may impact on toxicity)

- Recent myocardial infarction
- Loading doses may need to be reduced if digoxin or another cardiac glycoside has been given in the preceding two weeks

IV loading dose (normal renal function):

- IV loading should only be used in patients requiring urgent digitalisation or in patients who are nil by mouth (all IV loading requires ECG monitoring). Otherwise use PO
- A large peripheral vein should be used
- 500 micrograms stat followed by 250 micrograms in 6 hours followed by a further 250 micrograms in 6 hours
- Add Digoxin dose to 100mls of 0.9% sodium chloride or Glucose 5% and infuse over at least 2 hours via infusion pump
- Revert to oral therapy as soon as possible

PO loading dose (normal renal function):

- Standard practice is 500 micrograms stat followed by 250 micrograms in 6 hours
- A further 250 micrograms can be considered 6 hours following this

PO maintenance dose (normal renal function):

- A maintenance dose of 125 micrograms should be commenced if clinically indicated at this point (caution in elderly and low body weight, see below)

Renal dose loading/maintenance:

- Consideration should be given to reducing the loading and maintenance dose in renal impairment
- Consider 62.5micrograms in significant renal impairment (if unclear please discuss with senior colleagues)

Monitoring:

- Consideration for dose reduction should be given in:
  - ✓ Renal impairment
  - ✓ Elderly
  - ✓ Low body weight (<50kg)
  - ✓ Symptoms of toxicity
  - ✓ Lack of response
  - ✓ Interacting medication which may increase toxicity (e.g. amiodarone)
  - ✓ Recent changes in dosage

- Monitoring usually not required when patients are stabilised and clinically/biochemically stable
- Levels should be checked at least 6 hours following dose (SHSCT lab range 0.5-2.0 micrograms/L, in HF this is reduced to 0.5-1.0 micrograms/L)
- Consideration should be given by the prescriber to checking a digoxin level 1-2 weeks following commencement to be reflective of steady state levels
- Will require periodic monitoring and possible adjustment of dose (may need discussed with GP on discharge)

Special considerations:

- Particular caution of toxicity in elderly, frail, low body weight and reducing renal function
- In patients with an underlying heart rate of <60bpm consideration should be given to checking digoxin levels

Interactions:

- This is not an exhaustive list, refer to BNF for full list
- Detailed information can be found in the SPC
- Potassium-depleting diuretics are a major contributing factor to digitalis toxicity.
- Calcium, particularly if administered rapidly by the intravenous route, may produce serious arrhythmias in digitalized patients.
- Quinidine, verapamil, diltiazem, amiodarone, propafenone, indomethacin, itraconazole, alprazolam, and spironolactone raise the

serum digoxin concentration due to a reduction in clearance and/or in volume of distribution of the drug, with the implication that digitalis intoxication may result (consider using half dose if concurrent use is required and checking dose periodically)

- Erythromycin, clarithromycin and tetracycline may increase digoxin absorption in patients who inactivate digoxin by bacterial metabolism in the lower intestine, so that digitalis intoxication may result.
- Rifampicin may decrease serum digoxin concentration, especially in patients with renal dysfunction, by increasing the non-renal clearance of digoxin.

Toxic effects:

- Nausea/vomiting
- Diarrhoea
- Visual disturbance
- Arrhythmias

Notes:

- Loading with digoxin not required for heart failure patients in normal sinus rhythm

Further information:

- ✓ Medusa
- ✓ BMJ Best Practice: Digoxin overdose (Jan 2022)
- ✓ BNF
- ✓ AF NICE guideline 2021 (NG196)

Signed:

Dr David Mc Eneaney	Dr Mick Connolly
Consultant cardiologist	Consultant cardiologist
Sharon Brownlee	Dr Ian Menown
Pharmacist	Consultant cardiologist