

Who can administer

INFUSION may be administered by registered competent doctor or nurse/midwife.

Bolus injection- Restricted see [appendix 1](#)

Important information

- **Always prescribe** the dose in **micrograms**
- For dose guidance for **transferring patients from PO to IV** therapy- see under 'Dose'
- See **monitoring** requirements
- **Renal** dose adjustments are required

Available preparations

Lanoxin 500 microgram per 2ml ampoule

Reconstitution

Already in solution

Draw up using a 5micron filter needle

Dilute further prior to administration

Infusion fluids

Sodium chloride 0.9% or Glucose 5%

Methods of intravenous administration

Intermittent intravenous infusion (using an electronically controlled infusion device) (preferred route)

- Add required dose to 100ml of infusion fluid. (ref 1)
- A 50ml infusion may be used if required (eg fluid restriction) but the residual volume in the infusion line must be flushed through at the same rate to avoid significant underdosing
- If loading with repeated fractions of small doses (e.g. 50%, 25%, 25%) the infusion may be given over 10 to 20 minutes.
- However, where large loading doses are required in emergencies (e.g. 750microgram to 1000microgram) a minimum infusion time of 2 hours is suggested (ref 1)
- If using a two hour infusion time, protect infusion solution from light

Slow intravenous injection (not generally recommended)

- Intravenous infusion is preferred but if essential digoxin may be administered by slow intravenous injection as follows:
- **Bolus administration is more likely to cause adverse effects.** Patients should be monitored closely for signs of digoxin toxicity; hypertension and reduced coronary flow (ref 1)
- **Either** dilute at least four fold (add 4ml to 1ml) with either Sodium chloride 0.9% or Glucose 5% and

administer over 10 to 20 minutes(ref 1,3) **OR**

- **If fluid-restricted:** administer undiluted via a large vein or central line over at least 5 minutes (ref 3) (unlicensed)

Dose in adults

LOADING DOSE (for patients who have not been given cardiac glycosides within the previous two weeks)

- **The normal loading dose is 500 to 1000 microgram** (depending on age, lean body weight and renal function)
- This is usually given in three divided doses of 50%, 25%, 25%
- Each part of the dose should be given four to eight hours after the last
- Example: total dose required is 1000microgram:
 - Give 500microgram
 - Followed by 250microgram four hours later
 - Followed by a further 250microgram after a further four hours
- An assessment of clinical response should be performed before giving each additional dose

Urgent (emergency) loading required (ref 2)

- Give 750 to 1000 microgram over a minimum of 2 hours
- A reduced loading dose may be needed if the patient has received digoxin in the last 2 weeks

MAINTENANCE DOSE

- Where a patient is on oral digoxin, and a temporary switch to IV is indicated eg if a patient is unable to take oral digoxin, the intravenous dosage should be reduced by approximately 33% - for example, 250 micrograms tablet is approximately equivalent to 166 micrograms IV - round to 175 micrograms
- Monitor levels closely if switching between routes of administration

Renal impairment

Dose reductions required - contact pharmacy for advice

Monitoring

Telemetry monitoring during administration ^(ref 5)

Monitoring of levels

- At least **6 or more hours after the last dose** to allow for redistribution

Therapeutic range

- **Heart failure:** Trough levels usually between 0.64 to 1.28 **nanomols/L** (0.5 to 1nanograms/ml)
- **Other indications:** Trough levels usually between 0.64 and 2.6 **nanomol/L** (0.5 to 2 nanograms/ml) (ref 4)
- However, toxicity may occur with lower digoxin serum concentrations. In deciding whether a patient's symptoms are due to digoxin, the clinical state together with the serum potassium level and thyroid function are important factors.

Further information

- Intramuscular injection is NOT RECOMMENDED, as it is painful and is associated with muscle necrosis
- An antidote (**Digifab**) is available for suspected digoxin toxicity

Storage

- Store below 25⁰C

References

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1. Medusa Injectable Medicines Guide downloaded 03/2022
- 2: BNF 83
- 3: Minimum Infusion Volumes for Fluid Restricted Critically Ill Patients 4rd Ed
4. Medicines Complete - assessed online 03/2022
- 5: Local guidelines, email on file, January 2017

Therapeutic classification

Cardiac glycosides