MONOGRAPH

DIGOXIN

Scope (Staff):	Medical, Pharmacy, Nursing, Anaesthetic Technicians
Scope (Area):	Enteral – All Clinical Areas IV – Paediatric Critical Care (PCC), Theatre and Emergency Department (ED) only

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this DISCLAIMER

⚠ HIGH RISK MEDICINE ⚠

QUICKLINKS

Dosage/Dosage Adjustments	Administration	Compatibility	Monitoring & Digoxin Toxicity

DRUG CLASS

Antiarrhythmic; Cardiac glycoside.(1)

Digoxin is a High Risk Medicine.

INDICATIONS AND RESTRICTIONS

- Supraventricular arrhythmias.(2)
- Heart failure.(3)

For prescription under the direction of a Cardiologist. See Formulary One.

CONTRAINDICATIONS

- Hypersensitivity to digoxin, any component of the formulation or any other forms of digitalis.(3)
- Second or third degree heart block (without pacemaker).(1)
- Supraventricular tachycardia involving accessory pathway (Wolff-Parkinson-White syndrome).(2)
- Ventricular tachycardia and fibrillation.(2)
- Hypertrophic obstructive cardiomyopathy.(1)

- Cor pulmonale.[1]
- Constrictive pericarditis.[2]

PRECAUTIONS

- Hyperthyroidism – may reduce digoxin concentration and increase sympathetic tone.[1]
- Hypothyroidism – may increase digoxin concentration.[1]
- Hypokalaemia, hypomagnesaemia, hypercalcaemia, acidosis, hypoxia – increased sensitivity to digoxin.[1]
- Direct current cardioversion – increased risk of arrhythmias; withhold digoxin for 1 – 2 days prior to cardioversion or use lowest effective energy.[1]
- Use digoxin with caution in patients with renal disease associated with heart failure, such as acute glomerulonephritis, renal impairment, and renal failure – renal impairment reduces the excretion of the drug and cause toxicity. [6]
- Malabsorption syndrome or gastrointestinal reconstruction – may require higher doses. [3]

FORMULATIONS

Listed below are products available at PCH, other formulations may be available, check with pharmacy if required:

- 25 micrograms/mL Ampoule
- 50 micrograms/mL Elixir

Imprest location: Formulary One

DOSAGE & DOSAGE ADJUSTMENTS

Neonates: **Refer to Neonatal Medication Protocols**

Guidelines for Drug Dosing in Overweight: Calculate dose using **ideal body weight** in obese/overweight patients.[1, 3]

Lower doses may be required in treatment of heart failure than for arrhythmias.[4]

LOADING Dose

Loading dose is not usually necessary when treating heart failure.

Children ≥ 4 weeks – 10 years

- **IV/Enteral:** 10 – 20 micrograms/kg; may be repeated every 6 hours (max 4 doses in total) until therapeutic effect achieved or signs of adverse effects observed.[5]
- Maximum **total** loading dose: 500 micrograms (IV) or 750 micrograms (enteral).[4]

Children > 10 years[5]

- **Enteral:** 10 – 20 micrograms/kg as a single dose OR **divided** into 3 or 4 doses given 4 – 6 hours apart. Maximum **total** loading dose: 750 – 1500 micrograms.

- **IV:** 250 – 500 micrograms/dose; may be repeated every 4 – 6 hours.
  Maximum **total** loading dose: 500 – 1000 micrograms.

Maintenance

All ages (IV/Enteral):

- Initially 3 – 5 micrograms/kg (max 125 micrograms) TWICE daily.[4,9]
- Titrate up to 10 micrograms/kg TWICE daily if necessary; Maximum 250 micrograms TWICE daily.[5]
- Total daily dose of up to 250 micrograms may be given as a single daily dose; larger doses should be given in 2 divided doses.[5]

Note: When changing from IV route to enteral, a 20–30% dose increase may be necessary[4].

Renal impairment[6]:

eGFR calculator

- eGFR >50 mL/min/1.73 m^2: No adjustment necessary.
- eGFR 30 – 50 mL/min/1.73 m^2: Administer 75% of usual dose at usual intervals.
- eGFR 10 – 29 mL/min/1.73 m^2: Administer 50% of usual dose at usual intervals.
- eGFR <10 mL/min/1.73 m^2: Administer 25% of usual dose at usual intervals.

Hepatic impairment[6]:

No specific dosage adjustments recommended. Patients with combined renal and hepatic impairment should be monitored closely for toxicity due to risk of drug accumulation and reduced clearance.

ADMINISTRATION

IV digoxin must only be administered in PCC, Theatre and ED.

Important notes to prevent inadvertent overdose when administering digoxin (all routes):

- If dilution is necessary, draw up digoxin in one syringe and add it to a separate syringe containing diluent (2-syringe technique).[6]
- Do not flush the dead space of the syringe used to draw up or administer digoxin.[6]

Intravenous – To be administered in PCC, Theatre, ED only

- Administer undiluted or diluted with compatible fluid, over **at least** 5 minutes.[5-7]
  Rapid injection may cause hypertension and coronary arteriolar vasoconstriction.[3, 6, 7]
- Digoxin injection is a vesicant; exercise caution to avoid extravasation.[3]

Intramuscular/Subcutaneous: Not recommended as tissue damage and severe pain may occur. If necessary, administer undiluted via deep IM injection and massage site after administration.[7]

COMPATIBILITY *(LIST IS NOT EXHAUSTIVE)*

Compatible fluids[7]:

Glucose 5%, sodium chloride 0.9%, Hartmann's (compound sodium lactate).

Compatible at Y-site[3, 6, 7]:

Atracurium, calcium chloride, calcium gluconate, cefazolin, cefotaxime, ceftriaxone, clindamycin, dexmedetomidine, furosemide, gentamicin, glyceryl trinitrate, heparin sodium, hydrocortisone sodium succinate, levosimendan, midazolam, milrinone, morphine sulfate, Plasma-Lyte-148, potassium chloride, sodium bicarbonate, sodium nitroprusside, suxamethonium, vancomycin

Only commonly used drugs are listed below. This is not a complete list of incompatible drugs. Compatibilities of IV drugs must be checked when two or more drugs are given concurrently.

INCOMPATIBLE drugs[7]:

Amiodarone, caspofungin, fluconazole, foscarnet, pentamidine, propofol.

MONITORING

Monitoring parameters:

- Heart rate and rhythm, electrocardiogram, renal function (baseline and periodically as clinically indicated).[2, 3]
- Serum potassium level:
    - Hypokalaemia increases digoxin distribution to heart and muscle.[3] Risk of digoxin-induced arrhythmias.[3]
    - Hyperkalaemia decreases digoxin distribution to heart and muscle.[3]
    - Hyperkalaemia is an important marker and prognosis indicator in acute digoxin toxicity.[8]
- Serum magnesium level:
    - Hypomagnesemia increases risk of digoxin-induced arrhythmias.[6]
- Serum calcium level:
    - Hypercalcaemia increases risk of digoxin toxicity.[3]
    - Hypocalcaemia may nullify the effects of digoxin.[3]
- Serum digoxin concentration:
    - **Not an absolute indicator** of the absence/presence of digoxin toxicity. Not routinely recommended in paediatric population as it is not strongly associated with signs and symptoms of digoxin toxicity.[8]
    - Recommended if toxicity suspected or in patients at high risk of toxicity (e.g. known renal impairment or drug interaction).

- Time to steady-state without loading dose is approximately 7 days; longer in patients with renal impairment.[1]
- Spironolactone may interfere with digoxin radioimmunoassay.[3]
- Therapeutic range (trough): 0.8 – 2micrograms/L.[2, 3]
- Lower target trough level (0.5 – 0.8micrograms/L) may be sufficient for treatment of heart failure or atrial fibrillation.[1]

Digoxin toxicity:

- Digoxin toxicity may still occur at therapeutic levels.[3]
- Digoxin toxicity should be diagnosed based on clinical and electrocardiographic signs instead of digoxin plasma concentration as a single indicator.[8]
- Use of digoxin-specific antibody (Fab) may be necessary in severe cases. Contact Cardiology or Toxicology for advice.

ADVERSE EFFECTS

Common: Anorexia, nausea, vomiting, diarrhoea, arrhythmia, bradycardia, rash, headache, dizziness, drowsiness, visual disturbances (e.g. blurred or yellow vision).[1, 6]

Infrequent: Shortened QRS complex, atrial/ventricular extrasystoles, paroxysmal atrial tachycardia with AV block, ventricular tachycardia or fibrillation, heart block.[1, 6]

Rare: Thrombocytopenia, seizures, confusion, psychosis, gynaecomastia (with long-term use).[1, 6]

In children, arrhythmias (including sinus bradycardia) are the earliest and most frequent indicators that digoxin dosage is too high.[1]

STORAGE

Ampoule: Store below 30º C, protected from light.[5, 7]

Elixir: Store below 25º C, protected from light.[5, 7]

INTERACTIONS

This medication may interact with other medications; consult PCH approved references (e.g. Clinical Pharmacology), a clinical pharmacist or PCH Medicines Information Service on extension 63546 for more information.

Please note: The information contained in this guideline is to assist with the preparation and administration of **digoxin**. Any variations to the doses recommended should be clarified with the prescriber prior to administration

References

1. Royal Australian College of General Practitioners, Pharmaceutical Society of Australia, Australasian Society of Clinical and Experimental Pharmacologists and Toxicologists. Australian Medicines Handbook. Adelaide, S. Aust.: Australian Medicines Handbook; 2025. Available from: https://amhonline-amh-net-au.pklibresources.health.wa.gov.au/.

References

2. Paediatric Formulary Committee. BNF for Children: 2025. London: BMJ Group Pharmaceutical Press; 2022. Available from: https://www-medicinescomplete-com.pklibresources.health.wa.gov.au/mc/bnfc/current/.
3. Digoxin - Pediatric drug information [Internet]. Lexicomp. 2025 [cited 19/05/25]. Available from: https://www-uptodate-com.pklibresources.health.wa.gov.au/contents/digoxin-drug-information?sectionName=Pediatric&topicId=9360&search=digoxin&usage_type=panel&anchor=F160169&source=panel_search_result&selectedTitle=1~150&showDrugLabel=true&kp_tab=drug_general&display_rank=1#F160169.
4. Royal Australian College of General Practitioners, Pharmaceutical Society of Australia, Australasian Society of Clinical and Experimental Pharmacologists and Toxicologists. AMH: Children's Dosing Companion. Adelaide: Australian Medicines Handbook Pty Ltd; 2025. Available from: https://childrens-amh-net-au.pklibresources.health.wa.gov.au/search?q=.
5. AusDI online [Internet]. 2025 [cited 19/05/25]. Available from: https://ausdi-hcn-com-au.pklibresources.health.wa.gov.au/quickSearch.hcn.
6. Clinical Pharmacology powered by ClinicalKey [Internet]. Elsvier. 2025 [cited 19/05/25]. Available from: https://www-clinicalkey-com.pklibresources.health.wa.gov.au/pharmacology/.
7. Symons K. Ermer J. (editors). Australian injectable drugs handbook. Collingwood: The Society of Hospital Pharmacists of Australia; 2025.
8. Digitalis (cardiac glycoside) poisoning [Internet]. Lexicomp. 2025 [cited 19/05/25]. Available from: https://www-uptodate-com.pklibresources.health.wa.gov.au/contents/digitalis-cardiac-glycoside-poisoning?search=digitalis&source=search_result&selectedTitle=2~150&usage_type=default&display_rank=1.
9. Shipton S. Digoxin dosing and monitoring, 2025 Oct 2. Expert opinion (email correspondence).

Useful resources (including related forms)

Digitalis (cardiac glycoside) poisoning

This document can be made available in alternative formats on request for a person with a disability.

File Path:	W:\Safety & Quality\CAHS\CLOVERS MEDICAL Pharmacy\Procedures Protocols and Guidelines\Medication Monographs_Word\PCH.MED.Digoxin.docx		
Document Owner:	Chief Pharmacist		
Reviewer / Team:	Senior Pharmacist, Cardiologist, PCC Consultant, PCC CNS		
Date First Issued:	Apr 2017	**Last Reviewed:**	July 2025
Amendment Dates:	Apr 2017, Sep 2020, June 2022, Oct 2025	**Next Review Date:**	July 2028
Approved by:	PCHN Medication Safety Committee	**Date:**	July 2025
Endorsed by:	CAHS Drug & Therapeutics Committee	**Date:**	Oct 2025
Standards Applicable:	NSQHS Standards: NSMHS: N/A Child Safe Standards: N/A		

Printed or personally saved electronic copies of this document are considered uncontrolled

Healthy kids, healthy communities

Compassion | Excellence | Collaboration | Accountability | Equity | Respect

Neonatology | Community Health | Mental Health | Perth Children's Hospital