MONOGRAPH

DESMOPRESSIN

Scope (Staff):	Medical, Pharmacy, Nursing
Scope (Area):	All Clinical Areas

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

QUICKLINKS

Dosage/Dosage Adjustments	Administration	Compatibility	Monitoring

DRUG CLASS

Desmopressin is a synthetic antidiuretic hormone (arginine vasopressin) analogue.[1]

Desmopressin increases factor VIII and von Willebrand's factor (vWF) plasma levels.[1]

INDICATIONS AND RESTRICTIONS

- Treatment of central (cranial) diabetes insipidus.[2]
- Control minor bleeding episode or maintain haemostasis during minor surgical procedures in patients with mild/moderate haemophilia A, type 1 von Willebrand's disease (vWD), type 2 vWD (except subtype 2B), uraemia and certain platelet disorders.[2,3]
- Primary nocturnal enuresis.[4]
- Fibrinolytic response test in vWD.[4]
- Diagnosis of diabetes insipidus (water deprivation test).[4]
- Renal concentrating capacity test.[3]
- Assessment of antidiuretic hormone secretion.[4]

CONTRAINDICATIONS[2, 3]

- Hypersensitivity to desmopressin or any component of the formulation.
- Hyponatraemia.
- Type 3 vWD – desmopressin is not effective in patients with type 3 vWF.[2]
- Type 2B vWD - increased risk of transient thrombocytopenia.
- Syndrome of inappropriate antidiuretic hormone (SIADH) secretion.
- Cardiac insufficiency (such as heart failure) or other conditions requiring diuretic therapy.
- Polydipsia.

PRECAUTIONS

- Major surgery – vWF concentrate may be required instead of desmopressin to achieve target level of vWF ristotectin cofactor activity.[5]
- Conditions that may be aggravated by fluid retention or electrolyte imbalances (e.g. cystic fibrosis, heart failure, hypertension, seizure disorders, renal disorders).[4]
- Patients using non-steroidal anti-inflammatory drugs or drugs known to induce SIADH.[1]
- Avoid fluid overload – increased risk of hyponatraemia.[4]

FORMULATIONS

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

- Wafer: 120 micrograms, 240 micrograms
- Tablet: 200 micrograms
- Oral solution: 10 micrograms/mL (compounded by PCH Pharmacy)*****
- Ampoule: 4 micrograms/mL, 15 micrograms/mL
- Nasal drops: 100 micrograms/mL
- Nasal drops (diluted): 10 micrograms/mL (compounded by PCH Pharmacy)*****
- Nasal spray: 10 micrograms/actuation

*Check with the clinical pharmacist prior ordering these preparations from pharmacy.

Imprest location: Formulary One

DOSAGE & DOSAGE ADJUSTMENTS

Approximate **dose equivalence**[6]

- 1 microg parenteral dosage ≈ 10 microg intranasal dosage
- 120 microg sublingual wafer ≈ 200 microg oral tablet

Neonates – consult neonatologist/endocrinologist for expert advice.

Use of desmopressin for indications NOT outlined in this monograph must be discussed with an endocrinologist or haematologist.

Treatment of central (cranial) diabetes insipidus

Adjust dose according to response. If giving in 2 unequal doses, give the larger dose at night and the smaller dose during the day to prevent nocturia.[6]

IV / IM / *Subcut*

- Child ≥ 4 weeks
- Initial weight based starting dose below. Await breakthrough polyuria before next dose is given. Titrate up by 50% until clinical response is achieved[14]

Weight (kg)	Dose (microg)
0 - 10	0.02 - 0.04
10 - 20	0.04 - 0.08
20 - 30	0.08 - 0.12
30 - 40	0.12 - 0.16
40 - 50	0.16 - 0.24
50 - 70	0.28 - 0.36
> 70	0.4

  - Higher doses up to 0.3 microg/kg/dose, titrated to response, may be used at the discretion of a PCC or endocrinology consultant[7]
- For patients previously on maintenance intranasal desmopressin, administer one-tenth ($^1/_{10}$) of their usual maintenance intranasal dose.[2]

Oral/Enteral

- Child ≥ 4 weeks – 23 months: Initially 10 microg 2–3 times daily; usual maintenance dose 30–150 microg daily in divided doses.[4, 6]
- Child 2 – 11 years: Initially 25 microg 2–3 times daily; usual maintenance dose 100–800 microg daily in divided doses.[4, 6]
- Child ≥ 12 years: Initially 50 – 100 microg 2–3 times a daily; usual maintenance dose 0.2–1.2 mg daily in divided doses.[4, 6]

Sublingual

Child ≥ 2 years: Initially 60 microg 3 times daily; titrate to effect up to a maximum dose of 240 microg 3 times daily.[4, 6]

Intranasal

- Titrate to effect. Maximum recommended **total daily dose**: 30 microg[8]
- Child ≥ 4 weeks – 23 months: Initially 1–5 microg daily in 1 – 2 divided doses.[4, 6]
- Child 2 – 11 years: Initially 5–20 microg daily in 1 – 2 divided doses.[4, 6]
- Child ≥ 12 years: Initially 10–20 microg daily in 1 – 2 divided doses.[4, 8]

Control of minor bleeding episode or maintain haemostasis during minor surgical procedures in patients with mild/moderate haemophilia A, type 1 von Willebrand's disease (vWD), type 2 vWD (except subtype 2B), uraemia and certain platelet disorders.

- Perform vWD assay before infusion and repeat assay 30 – 60 mins post-infusion.[9]

IV/Subcut (≥ 3 months old):

- 0.3 microg/kg (max 20 microg for perioperative bleeding prophylaxis)[2,9]; repeat after 2 hours if necessary.[9]
  - Any further repeat doses (if necessary) should be given at least 12 hours apart.[2, 4, 9]
- Administer 30 minutes prior to procedure if using pre-operatively.[2]

Primary nocturnal enuresis (child ≥ 6 years)

Limit fluid intake from 1 hour prior to up until 8 hours after dose.[6]

Oral/Enteral:

- Initially 200 microg 1 hour before bedtime; titrate up to 600 microg if necessary.[2, 8]

Sublingual wafer:

- Initially 120 microg 1 hour before bedtime; increase to 240 microg if necessary.[3, 6]

Diagnosis of diabetes insipidus (water deprivation test)[4]

Manage fluid intake cautiously to avoid hyponatraemia.

Intranasal – as a single dose

- Child ≥ 4 weeks – 23 months *(not routinely recommended)*: 5 – 10 microg.
- Child 2 – 11 years: 10 – 20 microg.
- Child ≥12 years: 20 microg.

IM/Subcut – as a single dose

- Child ≥ 4 weeks – 23 months *(not routinely recommended)*: 0.4 microg (*400* ***nanograms****)*
- Child 2 – 11 years: 0.5 – 1 microg.
- Child ≥ 12 years: 1 – 2 microg.

Fibrinolytic response testing in vWD

IV/Subcut

- *Child ≥ 2 years*: 0.3 microg/kg (max 20 microg) as a single dose.[4]
- Check full blood count, factor VIII and vWF levels immediately prior to infusion, then repeat at 1 hour and 4 hours post-dose.[10]

Renal concentrating capacity testing[4]

Empty bladder immediately prior to administration.

Intranasal – as a single dose

- Child ≥ 4 weeks – 11 months: 10 microg. Reduce fluid intake to 50% with the next 2 feeds following administration.
- Child 1 – 14 years: 20 microg. Reduce fluid intake to 500 mL starting from 1 hour prior to until 8 hours after administration.

- Child >15 years: 40 microg. Reduce fluid intake to 500 mL starting from 1 hour prior to until 8 hours after administration.

Assessment of antidiuretic hormone secretion[4]

Intranasal – as a single dose (Child 1 month – 2 years)

- Congenital deficiency suspected: 0.1 – 0.5 microg (100 – 500 **nanograms**).
- Congenital deficiency **NOT** suspected: 1 – 5 microg.

Renal impairment:

- eGFR calculator
- Use with caution, antidiuretic effects may be reduced.[4]
- CrCl ≥ 50 mL/minute: No dosage adjustments required.[8]
- CrCl < 50 mL/minute: Contraindicated. Single-dose may be administered to manage uremic bleeding in patients with renal failure (repeat dose is not recommended).[8]

Hepatic impairment:

- No dosage adjustments recommended.[8]

ADMINISTRATION

Intravenous infusion[11]**:**

Infuse over 15 – 30 minutes. Suggested final dilution volume:

- Patients ≤ 10kg – 10 mL
- Patients > 10kg – 50 mL

Desmopressin injection may also be administered via IM (for doses up to 4 microg) or subcutaneous injection.[12] *Small doses will require dilution and are susceptible to error. Suggested dilutions for ward based administration are below:*

Suggested dilution for Intramuscular or Subcutaneous Injection:	
Dose	Dilution
0.02 – 0.16 micrograms	Dilute 0.5 mL of solution from a 4 microg/mL ampoule to a total volume of 20 mL in sodium chloride 0.9% to give a final concentration of 0.1 microg/mL Draw up an additional 0.05 mL to prime needle tip. Use solution immediately.
0.16 – 0.8 micrograms	Dilute 0.5 mL of solution from a 4 microg/mL ampoule to a total volume of 4 mL in sodium chloride 0.9% to give a final concentration of 0.5 microg/mL Draw up an additional 0.05 mL to prime needle tip. Use solution immediately.
>0.8 micrograms	Use neat solution from 4 microg/mL ampoule. Draw up an additional 0.05 mL to prime needle tip.

Sublingual:

Place the wafer **under** the tongue and allow it to dissolve; do not swallow.[1] Halving of sublingual wafers is not routinely recommended [6], consider other dosage forms whenever possible.

Intranasal (nasal drops):

- For doses <5 microg, dilute **0.1 mL** of the 100 microg/mL nasal drops (this is equivalent to 10 microg) with **0.9 mL** of sodium chloride 0.9% (final volume = 1 mL), to produce a final concentration of **10 microg/mL**.[6]
- Administer via a nasal atomiser (MAD Nasal™ device) attached to a 1 mL syringe.
- **Draw up an extra 0.1 mL** of the nasal drop solution to be administered, to prime the atomiser prior to administration.

COMPATIBILITY[12]

Compatible fluids: Sodium chloride 0.9%

MONITORING

For all indications:

- Fluid balance, serum electrolytes (especially sodium), signs and symptoms of hyponatraemia.[2]
- Pulse and blood pressure should be monitored at baseline, during infusion and after completion.[2]

Additional monitoring required for specific indications:

- Central diabetes insipidus: urine specific gravity, plasma and urine osmolality.[2]
- Hemophilia A: Factor VIII coagulant activity, factor VIII ristocetin cofactor activity, and factor VIII antigen levels, aPTT.[2]
- vWD: Factor VIII coagulant activity, factor VIII ristocetin cofactor activity, factor VIII von Willebrand antigen levels, bleeding time.[2]

ADVERSE EFFECTS[1,8]

Common: hyponatraemia, xerostomia (dry mouth), nausea, abdominal cramps, pain and swelling at the injection site. Intranasal administration can be associated with local irritation, rhinitis, and nosebleed.

Infrequent: nasal congestion (intranasal), hypotension, hypertension, headache (with high doses), pharyngitis.

Rare: seizures, water intoxication, anaphylaxis, stroke, thromboembolism, thrombosis, myocardial infarction, chest pain, coma.

STORAGE[3]

- **Ampoules, nasal drops:** store between 2 – 8°C. Refrigerate, do no freeze. Protect from light.
- **Nasal spray:** store below 25°C, protect from light.
- **Wafer:** store below 25°C, keep in original container to protect from moisture and light.
- **Tablets**: store below 25°C, keep the container tightly closed and do not remove the desiccant capsule from the pack.

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 **desmopressin**. Any variations to the doses recommended should be clarified with the prescriber prior to administration

Related CAHS internal policies, procedures and guidelines

PCH Water Deprivation Test Guideline

PCH Clinical Practice Manual: Subcutaneous Injections Procedure

PCH Clinical Practice Manual: Intramuscular (IM) Injections Procedure

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