

Glucagon

1mg injection

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Note

This guideline provides advice of a general nature. This statewide guideline has been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach. The guideline is based on a review of published evidence and expert opinion.

Information in this statewide guideline is current at the time of publication.

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Health practitioners in the South Australian public health sector are expected to review specific details of each patient and professionally assess the applicability of the relevant guideline to that clinical situation.

If for good clinical reasons, a decision is made to depart from the guideline, the responsible clinician must document in the patient's medical record, the decision made, by whom, and detailed reasons for the departure from the guideline.

This statewide guideline does not address all the elements of clinical practice and assumes that the individual clinicians are responsible for discussing care with consumers in an environment that is culturally appropriate and which enables respectful confidential discussion. This includes:

- The use of interpreter services where necessary,
- Advising consumers of their choice and ensuring informed consent is obtained,
- Providing care within scope of practice, meeting all legislative requirements and maintaining standards of professional conduct, and
- Documenting all care in accordance with mandatory and local requirements

Dose and Indications

1 mg = 1000 micrograms = 1 unit

Management of Neonatal Hypoglycaemia

Intravenous Bolus, Intramuscular, Subcutaneous

200 microgram/kg (maximum of 1000 micrograms) as a single dose

Intravenous Infusion

Commence with 10 microgram/kg/hr to 20 microgram/kg/hr and titrate up to a maximum of 50 microgram/kg/hr



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Preparation and Administration

Intravenous Bolus, Intramuscular, Subcutaneous

Add 1 mL of the diluent provided (water for injection) to the 1 mg (1000 microgram) vial; this will give a resulting solution of 1000 microgram/mL

Dose	100 micrograms	200 micrograms	400 micrograms	600 micrograms	800 micrograms	1000 micrograms
Volume	0.1mL	0.2mL	0.4mL	0.6mL	0.8mL	1mL

Intravenous Infusion

Give via a dedicated line. Do not administer via the same line as parenteral nutrition due to know incompatibility with calcium containing solutions.

Select the strength required based on the weight of the infant in the context of any fluid restrictions. Glucagon Concentration Selection Table can be found on the following pages of this guideline to assist prescribers to gauge which strength is best for the patient.

The three standard strengths used are:

- > Glucagon 40 microgram/mL
- > Glucagon 80 microgram/mL
- > Glucagon 160 micrograms/mL

Formulae

To calculate infusion rate (mL/hr):

$$\text{Rate (mL/hr)} = \frac{\text{dose (micrograms/kg/hour)} \times \text{weight(kg)}}{\text{Strength (microgram/mL)}}$$

To calculate the dose (micrograms/kg/hour):

$$\text{Dose (micrograms/kg/hour)} = \frac{\text{Rate (mL/hr)} \times \text{Strength (microgram/mL)}}{\text{Weight (kg)}}$$

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Glucagon Concentration Selection Tables

Glucagon 40 micrograms/mL

Double dilution to make 25 mL syringe:

STEP ONE: Add 1 mL of the diluent provided (water for injection) to the 1 mg (1000 microgram) vial; this will give a resulting solution of 1000 microgram/mL.

STEP TWO: Add 1 mL of the 1000 microgram/mL glucagon solution to 24 mL 5% glucose (to a total of 25 mL). This makes a 40 microgram/mL solution.

Rate (mL/hr)	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	Rate (mL/hr)
Weight (kg)	Approximate micrograms/kg/hour									Weight (kg)
1	8	12	16	20	24	28	32	36	40	1
2	4	6	8	10	12	14	16	18	20	2
3	3	4	5	7	8	9	11	12	13	3
4	2	3	4	5	6	7	8	9	10	4

Discard remaining solution

Glucagon 80 micrograms/mL

Double dilution to make 25 mL syringe:

STEP ONE: Add 1 mL of the diluent provided (water for injection) to the 1 mg (1000 microgram) vial; this will give a resulting solution of 1000 microgram/mL. Prepare 2 vials.

STEP TWO: Add 2 mL of the 1000 microgram/mL glucagon solution to 23 mL 5% glucose (to a total of 25 mL). This makes an 80 microgram/mL solution.

Rate (mL/hr)	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	Rate (mL/hr)
Weight (kg)	Approximate micrograms/kg/hour									Weight (kg)
1	16	24	32	40	48	56	64	72	80	1
2	8	12	16	20	24	28	32	36	40	2
3	5	8	11	13	16	19	21	24	27	3
4	4	6	8	10	12	14	16	18	20	4
5	3	5	6	8	10	11	13	14	16	5

Discard remaining solution

Glucagon 160 micrograms/mL

Double dilution to make 25 mL syringe:

STEP ONE: Add 1 mL of the diluent provided (water for injection) to the 1 mg (1000 microgram) vial; this will give a resulting solution of 1000 microgram/mL. Prepare 4 vials.

STEP TWO: Add 4 mL of the 1000 microgram/mL glucagon solution to 21 mL 5% glucose (to a total of 25 mL). This makes a 160 microgram/mL solution.

Rate (mL/hr)	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	Rate (mL/hr)
Weight (kg)	Approximate micrograms/kg/hour									Weight (kg)
2	16	24	32	40	48	56	64	72	80	2
3	11	16	21	27	32	37	43	48	53	3
4	8	12	16	20	24	28	32	36	40	4
5	6	10	13	16	19	22	26	29	32	5

Discard remaining solution

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Compatible Fluids

Glucose 5%, sodium chloride 0.9%

Glucose 10% has been used

Adverse Effects

Infrequent

Vomiting, paroxysmal insulin secretion and rebound hypoglycaemia

Rare

Hypokalaemia (large doses), allergic reactions, hyponatraemia, thrombocytopenia, hypotension, hypertension, tachycardia

Monitoring

- > Blood glucose levels
- > If on continuous infusion, consider periodic electrolytes and platelets

Practice Points

- > Glucagon is not usual first line treatment of hypoglycaemia; consider in cases of hypoglycaemia refractory to intravenous glucose infusion, or when glucose infusion is unavailable, or in cases of documented glucagon deficiency
- > When considering original vial strength and possible patient condition, it is recommended that only 25 mL volume infusions are prepared
- > Watch for rebound hypoglycaemia. Rise in blood glucose will last approximately 2 hours
- > Persistent hypoglycaemia should not be treated with repeated doses of glucagon alone. Glycogen stores in preterm and growth retarded infants are limited and easily depleted
- > Evaluate glucose levels prior to each dose



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