

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

1mg = 1000micrograms = 1 unit

Management of Neonatal Hypoglycaemia

Intravenous Bolus, Intramuscular, Subcutaneous

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

Intravenous Infusion

Commence with 10 microgram/kg/hr to 20 microgram/kg/hr and titrate as required

(Doses up to 50 microgram/kg/hr have been used)

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Preparation and Administration

Intravenous Bolus, Intramuscular, Subcutaneous

Add 1mL of the diluent provided (water for injection) to the 1mg (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

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.

There are **TWO STEPS** to this process.

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

STEP TWO: Dilute the appropriate volume of the 1000microgram/mL glucagon injection using compatible fluid; and administer by continuous infusion.

The three standard strengths used are:

- > Glucagon 40microgram/mL
- > Glucagon 80microgram/mL
- > Glucagon 160micrograms/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 Table for **25mL** syringes

Double Dilution for Glucagon 40micrograms/mL

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

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

Double Dilution for Glucagon 80micrograms/mL

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

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

Double Dilution for Glucagon 160micrograms/mL

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

STEP TWO: Add 4mL of the 1000microgram/mL glucagon solution to 21mL 5% glucose (to a total of 25mL). This makes a 160microgram/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						2
3	11	16	21	27	32	37				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%

Adverse Effects

Infrequent

Vomiting, paroxysmal insulin secretion and rebound hypoglycaemia

Rare

Hypokalaemia (large doses), allergic reactions, hyponatraemia, thrombocytopenia

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 25mL volume infusions are prepared
- > Watch for rebound hypoglycemia. 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
- > Do not add to infusion fluids containing calcium—precipitation may occur
- > Subcutaneous glucagon infusions have been used.

Version control and change history

PDS reference: OCE use only

Version	Date from	Date to	Amendment
1.0	November 2012	current	Original version

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