South Australian Neonatal Medication Guidelines

glucagon

1mg injection

Government of South Australia
SA Health

ISBN number: 978-1-74243-399-8
Endorsed by: South Australian Maternal & Neonatal Clinical Network
Contact: South Australian Neonatal Medication Guidelines Workgroup at:
NeoMed@health.sa.gov.au

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Dose and Indications

1mg = 1000micrograms = 1unit

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)

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):

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

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

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

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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

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Discard remaining solution

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.

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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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