GROWTH HORMONE STIMULATION BY INSULIN AND L-DOPA

PURPOSE:

To test the ability of the pituitary to respond to either L-Dopa or insulin stimulation in subjects suspected of having growth hormone deficiency. This protocol provides a general outline of the maximum number of tests ordered. Based on specific physician instructions, a variable number of samples may be drawn; use this form to indicate what tests are required.

TEST PREPARATION:

1. NPO after midnight; bed rest procedure

2. Weight patient _____ lbs. = _____ kg (Example: 1 kg = 2.2 lbs)

3. Obtain:
   250/500 cc normal saline Regular insulin (human) Chemstrips
   IV set up, volutrol Red topped, green topped
   50% Dextrose (heparinized tubes)
   Lab Tests: glucose, HGH, cortisol 3 cc syringes
   sometimes TSH, FSH, LH 12 cc syringes

4. Call Specimen Processing to advise of tests (Extension 16220).

5. Send Specimen Processing this form and blood for glucose, growth hormone (HGH), and cortisol, the number of specimens, desired tests, and desired times should be specified by the ordering physician in the table below. **An ordering comment indicating the serial blood draw is required with each set of test orders as this may be the only identifer regarding specimen timing on lab reports.**

6. **Insulin and L-Dopa**

   1. 0 minutes – then give insulin after 0 min. drawing blood for following orders:
      a) Cortisol-Serum AM; b) Glucose, Fasting–Blood; and c) Human Growth Hormone

      Add the following ordering comment to above tests: “Fasting specimen for GH stimulation test with insulin and L-DOPA”. Per physican order, draw blood at the following checked times and for up to three (3) of the specified tests, adding the appropropriate ordering comment.

			Glucose Random Blood	**Human Growth Hormone**	**Cortisol Serum, pm**	**Required Ordering Comment**
2.	+15	minutes	_____	_____	_____	15 min; post-insulin
3.	+30	minutes	_____	_____	_____	30 min; post-insulin
4.	+45	minutes	_____	_____	_____	45 min; post-insulin
5.	+60	minutes	_____	_____	_____	60 min; post-insulin
6.	+90	minutes	_____	_____	_____	90 min; post-insulin

then give L-Dopa after 90 min. draw blood for specified tests and times checked per MD order:

	Glucose Random Blood	Human Growth Hormone	Cortisol Serum, pm	Required Ordering Comment
7. +105 minutes	_____	_____	_____	105 min; post-L-DOPA +15 min
8. +120 minutes	_____	_____	_____	120 min; post-L-DOPA +30 min
9. +135 minutes	_____	_____	_____	135 min; post-L-DOPA +45 min
10. +150 minutes	_____	_____	_____	150 min; post-L-DOPA +60 min
11. +180 minutes	_____	_____	_____	180 min; post-L-DOPA +90 min

7. **Insulin Alone**

1. 0 minutes – then give insulin after 0 min. draw blood for the 0-min tests as described in 6.1 above with ordering comment "Fasting specimen for GH stimulation test using insulin". Draw blood for additional specified tests and at specified times per MD order using check-list below:

	Glucose Random Blood	Human Growth Hormone	Cortisol	Required Ordering Serum, pm	Comment
2. +15 minutes	_____	_____	_____	15-min post-insulin	
3. +30 minutes	_____	_____	_____	30-min post-insulin	
4. +45 minutes	_____	_____	_____	45-min post-insulin	
5. +60 minutes	_____	_____	_____	60-min post-insulin	
6. +90 minutes	_____	_____	_____	90-min post-insulin	
7. +120 minutes	_____	_____	_____	90-min post-insulin	

PROCEDURE:

1. Start IV with normal saline, run at keep-open rate.

2. Draw 0 minute (baseline) blood sample.

3. Immediately give regular insulin 0.1 U/kg IV push.

4. Proceed with blood collections at above times. Monitor glucoses on all blood samples using fingerstick glucose meter.

5. Document reactions from insulin: drowsiness, jittery, sweaty, tired, clammy, elevated blood pressure, elevated heart rate.

6. Give orange juice if patient becomes confused or appears to be having a severe reaction to insulin. Give 50% dextrose injection IV - 1 cc/kg if patient loses consciousness.

7. After 90 minute sample, give L-Dopa as follows:

<25 lbs.	100 mg
25-39 lbs.	200 mg
40-54 lbs.	300 mg
55-69 lbs.	400 mg
>70 lbs.	500 mg

8. Watch for side effects of L-Dopa: nausea, vomiting.

9. Give orange juice at end of procedure. Advise patient to eat ASAP.

INTERPRETATION: Normal response 25 mg/mL HGH at anytime.

SOURCE:

1. Denny, et. al: J. Clin. Endo. Metab., 29:1499, 1969 (modified).

2. Gale EAM, et al: "The Physiological Effects of Insulin-Induced Hypoglycemia in Man." Clinical Science, August 1983.

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