## Overview

### Useful For

Diagnosis of acromegaly and assessment of treatment efficacy when interpreted in conjunction with results from glucose suppression test

Diagnosis of human growth hormone deficiency when interpreted in conjunction with results from growth hormone stimulation test

This test is **not** intended for use as a screen for acromegaly.

This test has **limited value** in assessing growth hormone secretion in normal children.

### Method Name

Immunoenzymatic Assay

### NY State Available

Yes

## Specimen

### Specimen Type

Serum

### Advisory Information

The recommended test for assessing growth hormone secretion in normal children is IGF1 / Insulin-Like Growth Factor 1, Serum.

The preferred test for acromegaly screening is IGF1 / Insulin-Like Growth Factor 1, Serum.

### Specimen Required

**Patient Preparation:** Fasting, 8 hours

**Container/Tube:**

- **Preferred:** Serum gel
- **Acceptable:** Red top

**Specimen Volume:** 0.6 mL

**Collection Instructions:**

1. If multiple specimens are drawn, submit each vial under a separate order.
2. Label specimens appropriately with the corresponding collection times.

## Forms
Test Definition: HGH
Growth Hormone, S

If not ordering electronically, complete, print, and send an Oncology Test Request (T729) with the specimen.

**Specimen Minimum Volume**
0.5 mL

**Reject Due To**

<table>
<thead>
<tr>
<th>Reason</th>
<th>Action</th>
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<tbody>
<tr>
<td>Gross hemolysis</td>
<td>Reject</td>
</tr>
<tr>
<td>Gross lipemia</td>
<td>OK</td>
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**Specimen Stability Information**

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
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<tbody>
<tr>
<td>Serum</td>
<td>Refrigerated (preferred)</td>
<td>7 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frozen</td>
<td>90 days</td>
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**Clinical and Interpretive**

**Clinical Information**
The anterior pituitary secretes human growth hormone (hGH) in response to exercise, deep sleep, hypoglycemia, and protein ingestion. hGH stimulates hepatic insulin-like growth factor-1 and mobilizes fatty acids from fat deposits to the liver. Hyposecretion of hGH causes dwarfism in children. Hypersecretion causes gigantism in children or acromegaly in adults.

Because hGH levels in normal and diseased populations overlap, hGH suppression and stimulation tests are needed to evaluate conditions of hGH excess and deficiency; random hGH levels are inadequate.

**Reference Values**

**Adults**
- Males: 0.01-0.97 ng/mL
- Females: 0.01-3.61 ng/mL

Reference intervals have not been formally verified in-house for pediatric and adolescent patients. The published literature indicates that reference intervals for adult, pediatric, and adolescent patients are comparable.

For SI unit Reference Values, see [https://www.mayocliniclabs.com/order-tests/si-unit-conversion.html](https://www.mayocliniclabs.com/order-tests/si-unit-conversion.html)

**Interpretation**

**Acromegaly:** For suppression testing, normal subjects have a nadir human growth hormone (hGH) concentration below 0.3 ng/mL after ingestion of a 75-gram glucose dose. Patients with acromegaly fail to show normal suppression. Using the Access ultrasensitive hGH assay, a cutoff of 0.53 ng/mL for nadir hGH was found to most accurately differentiate patients with acromegaly in remission from active disease with a sensitivity of 97% (95% CI, 83%-100%) and a specificity of 100% (95% CI, 82%-100%).(1)

**Deficiency:** A normal response following stimulation tests is a peak hGH concentration above 5 ng/mL in children and above 4 ng/mL in adults. For children, some experts consider hGH values between 5 ng/mL and 8 ng/mL equivocal.
and only GH peak values greater than 8 ng/mL as truly normal. Low levels, particularly under stimulation, indicate hGH deficiency.

Cautions

As the hGH test has limited value in assessing growth hormone secretion in normal children, IGF1 / Insulin-Like Growth Factor 1, Serum is recommended as the first test for assessing deficient or excess growth during childhood and adolescent development. IGF1 reference intervals for Tanner stages are available. Suspected causes of dwarfism should be diagnosed with the aid of provocative testing.

Elevated levels of human growth hormone indicate the possibility of gigantism or acromegaly, but must be confirmed with stimulation and suppression testing.

Growth hormone is secreted in surges; single measurements are of limited diagnostic value.

Clinical Reference


Performance

Method Description

The instrument used is the Beckman Coulter UniCel DXI 800. The Access Ultrasensitive human growth hormone (hGH) assay is a simultaneous one-step immunoenzymatic ("sandwich") assay. A sample is added to a reaction vessel along with polyclonal goat anti-hGH alkaline phosphatase conjugate and paramagnetic particles coated with mouse monoclonal anti-hGH antibody. The patient sample hGH binds to the monoclonal anti-hGH on the solid phase, while the goat anti-hGH-alkaline phosphatase conjugate reacts with a different antigenic site on patient sample hGH. After incubation in a reaction vessel, materials bound to the solid phase are held in a magnetic field while unbound materials are washed away. Then, the chemiluminescent substrate Lumi-Phos 530 is added to the vessel and light generated by the reaction is measured with a luminometer. The light production is directly proportional to the concentration of hGH in the sample. The amount of analyte in the sample is determined from a stored, multi-point calibration curve. (Package insert: Beckman Coulter Inc, Fullerton, CA, 03/2019)
PDF Report
No

Day(s) and Time(s) Test Performed
Monday through Friday; 5 a.m.-12 a.m.
Saturday; 6 a.m.-6 p.m.

Analytic Time
1 day

Maximum Laboratory Time
3 days

Specimen Retention Time
14 days

Performing Laboratory Location
Rochester

Fees and Codes

Fees
- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their Regional Manager. For assistance, contact Customer Service.

Test Classification
This test has been cleared, approved or is exempt by the U.S. Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information
83003

LOINC® Information

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<tr>
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<th>Test Order Name</th>
<th>Order LOINC Value</th>
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<td>Growth Hormone, S</td>
<td>2963-7</td>
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