Chapter 13
Growth Hormone Suppression Test (Post-Glucose Administration)

Indication:	To establish the diagnosis of acromegaly when there is modest elevation of IGF-1 (<2-fold upper limit of normal) with absent or equivocal clinical features [1]
Preparation:	10 h fasting
Materials Needed:	Glucose drink 75 g
Glucose: Grey top tube **Growth hormone:** Gold top tube	Five (5) Gold top tubes labeled baseline, 30, 60, 90 and 120 minutes Four (4) grey top tubes labeled 30, 60, 90 and 120 minutes Saline lock/ 22 G angiocath
Assay for GH:	Immunoenzymatic assay
Precautions:	Patients may complain of nausea.
Interpretation:	Diagnosis of acromegaly: Using ultrasensitive assays, a GH suppression to <0.4 ng/ml is considered the gold standard test to rule out acromegaly [2]. The GH cutoff value may vary based on the assay used. The authors use a GH cutoff value <0.2 ng/mL as a normal response, using a immunoenzymatic assay at Cleveland Clinic [1]. A GH level <1 ng/mL early after surgery, in the absence of presurgical usage of somatostatin analogs, predict long-term remission [3].

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Caveats:

- Endocrinologists should be familiar with the assays used in their laboratories, including the expected normal nadir GH level after oral glucose e [4].
- Elevated IGF-1 levels more than twice the upper limit of normal in patients with clinical features suggestive of an underlying acromegaly, are usually sufficient to establish the diagnosis [1].
- Failure of adequate suppression or a paradoxical rise in GH level can be seen in starvation, anorexia nervosa, and chronic renal failure, but these conditions are typically associated with low IGF-1 levels.
- GH levels during OGTT have not been well studied in patients with diabetes mellitus, and in those on estrogen . In the authors' experience, patients with diabetes who are not poorly controlled achieve GH levels during OGTT similar to those without DM [5].
- A paradoxical GH secretary response to glucose may be seen in premature infants, children of tall stature, and adolescents [6].

Procedure: Completed as outpatient.

1. Establish saline lock.
2. Check POC BG.
3. Draw baseline growth hormone.
4. Give glucose 75 g orally (glucose drink).
5. Draw glucose and growth hormone levels at 30, 60, 90, and 120 min [7].
6. (Include insulin levels at baseline, 30, 60, 90, and 120 min only if requested).

Patient label: _____

Physician name and signature: _____

RN performing the procedure: _____

Additional orders by physician: _____

GH suppression test	Baseline	30 min	60 min	90 min	120 min
Glucose					
GH					

References

1. Subbarayan SK, Fleseriu M, Gordon MB, et al. Serum IGF-1 in the diagnosis of acromegaly and the profile of patients with elevated IGF-1 but normal glucose-suppressed growth hormone. Endocr Pract. 2012;18(6):817–25.
2. Katznelson L, Atkinson JL, Cook DM, Ezzat SZ, Hamrahian AH, Miller KK. American association of clinical endocrinologists medical guidelines for clinical practice for the diagnosis and treatment of acromegaly-2011 update. Endocr Pract. 2011;17:1–44.
3. Minuto F, Resmini E, Boschetti M, et al. Assessment of disease activity in acromegaly by means of a single blood sample: Comparison of the 120th minute postglucose value with spontaneous GH secretion and with the IGF system. Clin Endocrinol (Oxf). 2004;61(1):138–44.
4. Melmed S, Casanueva F, Cavagnini F, et al. Consensus statement: Medical management of acromegaly. Eur J Endocrinol . 2005;153(6):737–40.
5. Dobri GA, Faiman C, Kennedy L, et al. Is the GH Nadir value during OGTT reliable in diagnosing acromegaly in patients with altered glucose metabolism? Poster Board SAT-128, Endo 2013. https://Endo.confex.com/endo/2013endo/webprogram/Paper7607.html.
6. Hattori N, Shimatsu A, Kato Y, et al. Growth hormone responses to oral glucose loading measured by highly sensitive enzyme immunoassay in normal subjects and patients with glucose intolerance and acromegaly. J Clin Endocrinol Metab. 1990;70(3):771–6.
7. Earll JM, Sparks LL, Forsham PH. Glucose suppression of serum growth hormone in the diagnosis of acromegaly. JAMA. 1967;201(8):628–30.