



Prior Authorization Approval Criteria

Human growth hormone

Generic name:	Human growth hormone, somatropin
Brand names:	Tev-Tropin, Humatrope, Nutropin, Genotropin, Norditropin, Saizen, Geref
Medication class:	Growth hormone
FDA-approved uses:	<p><i>Children:</i> growth failure due to inadequate secretion of endogenous growth hormone, short stature associated with Turner syndrome, growth failure due to chronic renal insufficiency.</p> <p><i>Adults:</i> For replacement of endogenous growth hormone in patients who have growth hormone deficiency alone or with multiple hormone deficiencies as a result of pituitary disease, surgery, radiation or trauma. Also for adults who have had growth hormone deficiency as children and have confirmed growth hormone deficiency as adults.</p>
Usual dose:	Varies.
Duration of therapy:	Children, until epiphyses close or patient no longer responds to treatment; Adults, indefinite.

Criteria for use in children (*bullet points below are all inclusive unless otherwise noted*):

- If patient meets the criteria for growth hormone therapy, FCHP will only approve the preferred formulary product. Other products may be approved if the patient has tried and failed or was intolerant to the FCHP preferred product or if the patient is unable to use a traditional syringe and vial due to physical impairment (including visual impairment).
- Prescribed by endocrinologist only or pediatric nephrologists (for GHD in chronic renal failure)
- Other reasons for short stature have been ruled out, such as hypothyroidism, chronic system disease, chronic illnesses, skeletal disorders, and medications.
- Must provide documentation of both growth hormone stimulation tests and IGF-1/IGF-BP-3 levels.
- Patient must have clinically diagnosed growth hormone deficiency (GHD) due to lack of endogenous growth hormone confirmed by biochemical diagnosis by means of :
 - Subnormal response to at least two provocative stimuli of GH release.
Subnormal response is generally accepted to be a peak GH level of less than 7 ng/ml as measured by RIA.

AND

- Low IGF-1 and IGF-BP-3 as indicated by a level below the normal range for age and gender, based on specific lab reference values.

Notes: Provocative tests of growth hormone stimulation include arginine, clonidine, glucagon, insulin, and levodopa. Peak GH level must be adjusted if monoclonal-based assay or recombinant human GH reference preparations are used, based upon specific lab reference values. In neonate with hypoglycemia, but no metabolic disorder, a peak GH level less than 20 ng/ml is usually diagnostic of GHD. IGF-1 can be low due to other conditions such as psychosocial deprivation, malnutrition, or hypothyroidism. IGF may be normally low in infants and young children. IGFBP-3 is less nutrition dependent than IGF.

- Short stature as defined by a height less than or equal to 2 standard deviations below the mean for age and gender or at or below the 3rd percentile for age and gender.
- Predicted adult height more than 1.5 standard deviations below the mid-parental height.

- Documentation of bone age (radiograph) at least 1 standard deviation below the normal for chronological age.
- Clinically determined growth failure as defined by a growth rate velocity < 7cm/year if < 3 yrs old, and <5cm/year if > 3 yrs old. *Note: During puberty, normal growth is about 7-10 cm/year and after puberty about 1-3 cm/year.*
- Documentation that epiphyses are not closed

OR

- Short stature (as defined above) or growth failure (as defined above) in females with clinically diagnosed Turner's Syndrome whose epiphyses are not closed and bone age less than 14 years. TS patients usually do not have low GH levels. Obtain bone age before starting therapy. *Note: Estrogen should not be started too early, as it may interfere with adult height (estrogen usually started age 12-15).*

OR

- Short stature (as defined above) or growth failure (as defined above) associated with chronic renal insufficiency in patients with CRF and ESRD up to the time of renal transplantation and whose epiphysis is not closed. Before starting therapy, existing metabolic derangements (such as acidosis, secondary hyperparathyroidism, under nutrition) should be corrected.

Criteria for continuation of therapy in children:

- Epiphysis must not be closed.
- Growth rate velocity must be equal to or greater than 2.5cm/year. *Note: Should see a doubling of pretreatment growth rate or an increase of 3cm/yr or more in the first year and 2.5 cm/yr thereafter.*
- In addition to above:
 - For Turner Syndrome: bone age less than 14 years
 - For chronic renal insufficiency: patient is not post renal transplant.

Monitoring in children:

- Thyroid function tests about every 6 months
- Glucose tolerance/diabetes testing
- periodic monitoring for intracranial hypertension
- monitor for malignant transformation of skin lesion
- If patient has history of scoliosis, then monitor for progression of scoliosis
- For TS: scoliosis, ear disorders (including otitis media), cardiovascular disorders, thyroid test, intracranial hypertension

Criteria for use in adults (bullet points below are all inclusive unless otherwise noted):

- If patient meets the criteria for growth hormone therapy, FCHP will only approve the preferred formulary product. Other products may be approved if the patient has tried and failed or was intolerant to the FCHP preferred product or if the patient is unable to use a traditional syringe and vial due to physical impairment (including visual impairment).
- Prescribed by endocrinologist only
- Adult patients with growth hormone deficiency alone or with multiple hormone deficiencies (hypopituitarism) as a result of pituitary disease of known causes including pituitary tumor, pituitary surgical damage, hypothalamic disease, irradiation, or trauma. Also for adults who had growth hormone deficiency as children and have reconfirmed GHD as adults with clinical symptomology.
- Patient must exhibit clinical features of adult GHD such as: increased body fat, insulin resistance (although hyperglycemia does not usually develop), decreased muscle mass, poor exercise performance, decreased bone density, and cardiovascular risk factors (such as increased clotting factors, decreased cardiac function, increase LDL, decrease HDL).
- Patients with Child Onset GHD (COGHD) must undergo retesting with at least 2 provocative GH stimulation tests following a GH wash out period (1 to 3 months) to determine if GHD

- persists as an adult. (If complete hypopituitarism exists, GHD is less in doubt).
- Must provide documentation of both growth hormone stimulation tests and IGF-1/IGF-BP-3 levels. Laboratory evidence of GHD as indicated by:
 - Response less than 3ng/ml to two provocative stimulation tests (test of choice is insulin), measured by RIA polyclonal antibody. *Note: Patients with multiple pituitary hormone deficiencies are more likely to have GHD, 1 stimulation test may be sufficient.*
 - OR**
 - IGF-1 level below the normal range for age and gender, based on specific lab reference values. *Note: Peak GH level must be adjusted if monoclonal-based assay or recombinant human GH reference preparations are used, based upon specific lab reference values.*
- Documentation of baseline information: IGF-1 level, lipids, bone density, cardiovascular factors, body composition, exercise capacity.

Continuation goals of therapy for adults:

- IGF-1 is in normal range for age and gender based on specific lab reference values. (If above normal, dose reduction required).
- Evidence of improvement in factors such as: body composition (decrease in body fat, increase in lean body mass, improvement in waist-to-hip ratio, waist circumference), increase in bone density, reduction of cardiovascular risk factors, improvement of lipid profile, increase in exercise capacity.

Monitoring in adults:

- Thyroid levels and lipid levels assessed initially and at 6 to 12 months
- Plasma glucose initially and every 3 months

Contraindications:

- Sensitivity to product or diluent
- Acute malignant disease
- Acute illness
- Closed epiphysis in children
- Benign intracranial hypertension (pseudotumor cerebri), proliferative or preproliferative diabetic retinopathy

Not approved if:

- Short stature without growth hormone deficiency (except as indicated in criteria)
- Diagnosis of growth hormone deficiency not confirmed by biochemical test.
- Growth hormone use for patients with non-specific symptomology such as lipidemia, depression and weight gain.
- Antiaging
- Performance enhancement for athletes
- Patient has any contraindications to the use of growth hormone.

Note:

- ng/ml = mcg/L
- Dosing conversion: IU or mU to mg is 3:1
- Due to variations in normal growth hormone secretion, assays, and labs, the clinician should include clinical, auxologic, radiologic, and biochemical factors.

FCHP Pharmacy and Therapeutics Committee approval: _____

Date: _____

Adopted: 12/10/2008