Growth, Short Stature, Failure to Thrive Referrals*

(Height < 3rd %ile, Poor linear growth velocity, Height > 4 inches below **MPTH)

BMI or weight < 3rd %ile or poor weight gain

Normal growth velocity,

Height > 3rd %ile and within 4" of MPTH

No endocrine evaluation needed.

Consider referral to feeding clinic or GI if warranted

Normal linear growth velocity and height < 3rd %ile or height > 4" below MPTH or h/o SGA/IUGR

Refer to endocrine for evaluation*

Fax referral to: 503-413-2419

Poor growth velocity regardless of height %ile

Bone age:

< 15 yr. old male

< 13 yr. old female

Yes

No

No endocrine evaluation needed – physiologic end of growth

Normal growth velocity, Height > 3rd %ile and within 4" of MPTH

No endocrine evaluation needed ***

*A bone age x-ray is recommended for all children referred for growth concerns. Our endocrinologists review the x-ray images. If x-ray is not done through Legacy Health, please send the image electronically through PACS before the visit.

***If you still feel an endocrine referral is warranted, please call on-call physician to discuss (503-413-1600)

**Calculate MPTH (Parental Target Height):

MALES: (+5" to Mom's height + Dad's height) /2 = MPTH

FEMALES: (-5" from Dad's height + Mom's height)/2 = MPTH

RANDALL CHILDREN'S HOSPITAL

LEGACY EMANUEL

Growth, Short Stature, Failure to Thrive Referrals*

(Height < 3rd %ile, Poor linear growth velocity, Height > 4 inches below **MPTH)

Our endocrinology providers:

Jessica Ferris MD

Maya Hunter MD

Radhika Purushothaman MD

Karin Selva MD

David Snyder MD

Sevket Yigit MD

To make a referral:

Refer via Epic or send a fax to the Randall Children's Hospital–Specialty Referral form at: **503-413-2419** (OR) or **360-487-1033** (WA).

After hours, call **Legacy One Call Consult & Transfer** at **1-800-500-9111** to speak to the on-call pediatric endocrinologist.

RANDALL CHILDREN'S HOSPITAL

LEGACY EMANUEL

Introduction

Short stature is a common concern in pediatrics. There can be many reasons for short stature, including constitutional, nutritional, familial, congenital, and hormonal. These guidelines are meant to help differentiate between when linear growth can continue to be monitored in the primary care setting, and when additional evaluation by a pediatric endocrinologist is warranted.

Common causes of short stature:

Constitutional Delay:

- This is otherwise known as being a "late bloomer". Linear growth tends to slow down around age 1-2 years, but then linear growth resumes at a normal growth velocity, but at a lower height percentile. Children continue to grow at a normal linear growth velocity. Bone age x-rays always show bone age delay. Children achieve catch up growth during puberty, which is also usually delayed. They often "fall off the growth chart" just prior to puberty as the general population achieves their pubertal growth spurt at the same time the late bloomers have a prepubertal slow down in their growth velocity. Linear growth catches up as the child goes through puberty.

Nutritional/Poor weight gain:

- Growth charts tend to show poor weight gain preceding slowing of linear growth, or they maintain appropriate linear growth. Poor weight gain can lead to slow linear growth. When this occurs, weight gain should be addressed first. A referral to a nutritionist or to the RCH feeding clinic would be appropriate. If GI symptoms are present, consider referral to gastroenterology.ovary and thyroid

Familial

- Children have short stature because their parents have short stature. Predicted height should be concordant with mid-parental target height. Growth hormone may be considered on the basis of idiopathic short stature, which is when predicted adult height is less than 63 inches for boys and less than 60 inches for girls.

Small for Gestational Age

- Children with birth length or weight less than the 2 SD below the mean, adjusted for gestational age. Growth hormone is indicated if the child has not had catch up growth by 2 years of age.

Hormonal

- Linear growth velocity is typically decreased with growth hormone deficiency or hypothyroidism. Growth charts tend to show slowing linear growth preceding slowing of weight gain, or they maintain appropriate weight gain. These children should undergo additional evaluation for growth.

Evaluation and Management:

- **Bone age x-ray**
- **Calculation of mid-parental target height**
  - MALES: (+5" to Mom's height + Dad's height) /2 = MPTH
  - FEMALES: (-5" from Dad's height + Mom's height)/2 = MPTH
- **Growth-related labs are typically obtained for children with decreased linear growth velocity:**
  - IGF-1, IGF-BP
  - TSH, free T4
  - CMP, CBC, ESR
  - TTG with IgA reflex, or celiac screening panel
- **Growth hormone: Growth hormone treatment is indicated, and FDA approved, for the following conditions:**
  - Growth hormone deficiency
  - Idiopathic short stature (predicted adult height < 63 inches for boys and < 60 inches for girls)
  - Short stature related to being small for gestational age without catch up growth by age 2 years
  - Genetic conditions: Turner syndrome, Noonan's syndrome, Prader-Willi syndrome, SHOX gene deficiency.

When to refer:

- Poor linear growth velocity: Linear growth velocity less than 4 cm/year (annualized)
- Normal linear growth velocity AND height < 3rd %ile, height > 4 inches below MPTH, or h/o SGA/IUGR
- If there are growth concerns that do not fall under these guidelines, please consider calling the on-call pediatric endocrinologist to discuss.

Referral process:

Please include:

- A copy of all growth charts available
- All labs results and bone age xray results
- If bone age xray was done outside of Legacy, please send digitally (PACS). Our endocrinologists would like to review the image.
- Recent notes

Additional Resources:

- Pediatric Endocrine Society Clinical Resource Library. URL: Home - Pediatric Endocrine Society (pedsendo.org)
- Rogol AD, Hayden GF. Etiologies and early diagnosis of short stature and growth failure in children and adolescents. J Pediatr 2014;164:S1-S14.

RANDALL CHILDREN'S HOSPITAL
LEGACY EMANUEL