# Child With Suspected Short Stature

## Suggestive history and physical findings

<table>
<thead>
<tr>
<th>Symptoms/signs:</th>
<th>Initial laboratory and/or radiologic work-up can include:</th>
<th>When to refer</th>
<th>Items useful for consultation</th>
<th>Additional information</th>
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<tbody>
<tr>
<td>Child well below 3rd percentile for height</td>
<td>Blood tests:</td>
<td>Urgent:</td>
<td>Previous growth data/growth charts</td>
<td>Additional Information</td>
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<tr>
<td>Child with decreasing growth velocity – crossing percentiles down after the age of 3 years</td>
<td>• Total or free T4 and TSH&lt;br&gt;• Comprehensive metabolic panel&lt;br&gt;• Complete blood count&lt;br&gt;• ESR or CRP&lt;br&gt;• IGF-1&lt;br&gt;• IGFBP-3&lt;br&gt;• Tissue transglutaminase IgA&lt;br&gt;• Total serum IgA</td>
<td>If child is growing poorly and is having headaches or vision changes&lt;br&gt;If you suspect a child may have multiple hormone deficiencies</td>
<td>Pertinent medical records&lt;br&gt;Recent laboratory studies&lt;br&gt;Bone age x-ray (actual film) if done</td>
<td>Constitutional Growth Delay and Familial Short Stature: A Guide for Families</td>
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<tr>
<td>Child’s height is significantly below the genetic potential</td>
<td>Radiologic studies:</td>
<td>Routine:</td>
<td></td>
<td>Short Stature: A Guide for Families</td>
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<tr>
<td>Child with a history of IUGR without catch-up growth by age 2</td>
<td>• Bone age x-ray of left hand and wrist</td>
<td>Height below 3rd percentile&lt;br&gt;Abnormal growth velocity in a child older than 3 years&lt;br&gt;Height potential is different than expected for the family</td>
<td></td>
<td>Growth Hormone Deficiency: A Guide for Families</td>
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<td>Syndromic appearance, abnormal body proportions</td>
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<td>References</td>
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</table>

### Differential Diagnosis

- Find a Pediatric Endocrinologist
**Differential diagnosis of short stature:**

Common causes:
- Familial or intrinsic short stature
- Constitutional delay of growth and puberty
  - Children typically cross percentiles downwards in the first 3 years, and then grow at a normal growth velocity on the lower percentiles or just below the 3rd percentile
  - Bone age is delayed
- Idiopathic short stature
  - Height < 2.25 SD below the mean for age and sex (shortest 1.2% of children) – FDA definition
  - Multiple etiologies are likely
  - Unlikely to attain adult height in the normal range (less than 63 inches for boys and 59 inches for girls)
  - Diagnostic evaluation excludes other causes of short stature
- Small for gestational age without catch up growth by 2 years

Other causes:
- Endocrine abnormalities:
  - Growth hormone deficiency
  - Hypothyroidism
  - Cushing’s syndrome
  - Growth hormone insensitivity
- Metabolic disease:
  - Rickets
  - Diabetes mellitus
- Syndromic:
  - Turner’s syndrome
  - Noonan’s syndrome
  - Trisomy 21
  - Russell-Silver Syndrome
  - Prader-Willi Syndrome
• DiGeorge Syndrome

Chronic Illness:
• Gastrointestinal diseases
  o Celiac disease
  o Inflammatory bowel disease
• Pulmonary diseases
  o Asthma
  o Cystic fibrosis
• Cardiac disease
• Renal disease
• Diabetes mellitus

Glucocorticoid treatment

Musculoskeletal issues:
• Skeletal dysplasia
• Spinal disorders

Psychosocial issues:
• Psychosocial dwarfism
• Fetal alcohol syndrome

Additional Information:

Mid-parental target height can be calculated with the following formulas:

For boys: Mother’s height + 5 inches averaged with father’s height

For girls: Father’s height – 5 inches averaged with mother’s height

Suggested References and Additional Reading:


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