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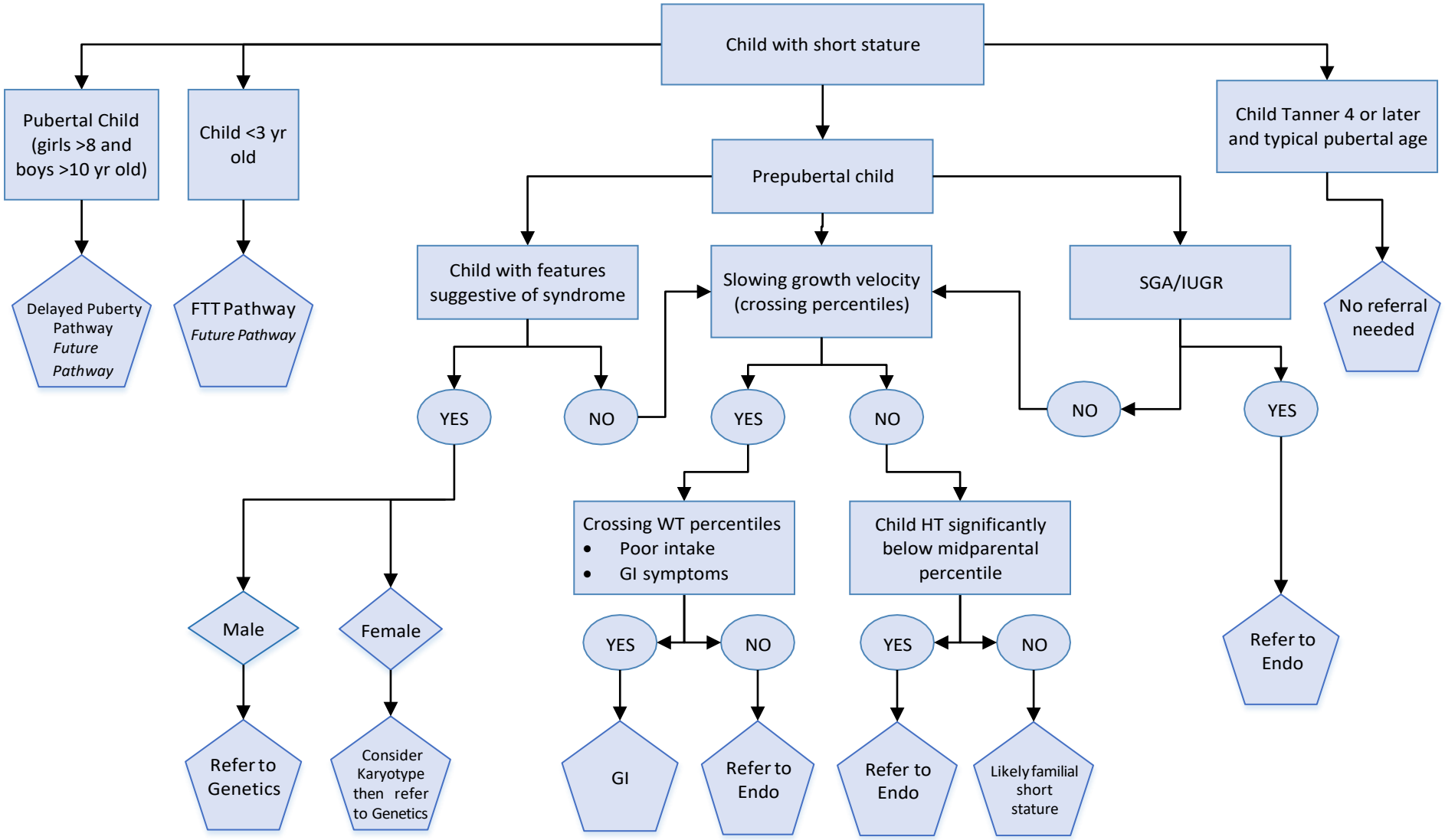
GROWTH PATHWAY



Refer to Page 2 for suggested workup and additional information

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Child with Suspected Short Stature

Initial laboratory and/or radiologic work-up can include:

Blood tests:

- Total or free T4 and TSH
- Comprehensive metabolic panel
- Complete blood count
- ESR or CRP
- IGF-1
- IGFBP-3
- Tissue transglutaminase IgA
- Total serum IgA
- Can consider chromosome analysis if female child has features of Turner's syndrome

Radiologic studies:

- Bone age x-ray of left hand and wrist

Differential diagnosis of short stature:

Common causes:

- Familial or intrinsic short stature
- Constitutional delay of growth and puberty
    - Children typically cross percentiles downward 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
    - Celiac disease
    - Inflammatory bowel disease
- Pulmonary diseases
    - Asthma
    - Cystic fibrosis
- Cardiac disease
- Renal disease
- Diabetes mellitus

Glucocorticoid treatment

Musculoskeletal issues:

- Skeletal dysplasia
- Spinal disorders

Psychosocial issues:

- Psychosocial dwarfism
- Fetal alcohol syndrome

Suggested References

- Polidori N, Castorani V, Mohn A, Chiarelli F. Deciphering short stature in children. Ann Pediatr Endocrinol Metab. 2020 Jun;25(2):69-79. doi: 10.6065/apem.2040064.032. Epub 2020 Jun 30.
- Rogol AD, Hayden GF. Etiologies and early diagnosis of short stature and growth failure in children and adolescents. J Pediatr 2014;164:S1-S14

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