

***A 13 year old Female  
with Poor Growth  
Delayed Puberty***

Pediatrics

# Objectives

- Define normal puberty and the stages of pubertal development in girls.
- Describe the differential diagnosis for pubertal delay.
- Initiate the evaluation of an adolescent with pubertal delay

# Part I: Introduction

A 13-and-a-half-year-old female, Sarah, comes to your office for her annual physical examination. Sarah has been in good health with no chronic medical problems and no acute illnesses.

Sarah has no concerns today but is accompanied by her mother who is worried that her daughter has not grown very much in the past year, and thinks her height and weight are the same as last year. Sarah reports that she thinks she's the only girl in her class who hasn't gotten her period.

# Part II: Next Steps

## *Current History:*

Sarah says that she likes to eat and remarks that her appetite has increased over the past two years. She eats a good variety of foods with no restrictions. She is active in sports, playing field hockey during the fall and tennis during the spring usually for 1-2 hours a day.

# Part II: Next Steps

On comprehensive ROS, she denies abdominal pain, nausea, vomiting, bloating and diarrhea. Her bowel movements are formed and often hard every other day. She has had no skin, joint, or visual complaints.

Your records show that one year ago, Sarah's breast and pubic hair development were both Tanner stage 2.

# Part II: Next Steps

## *Past Medical History:*

Sarah's past medical history is unremarkable. She was a full-term gestational infant. She is on no medications and has had no operations or hospital admissions. She developed breast buds at age 11 years, followed by development of scant pubic hair.

# Part II: Next Steps

## *Family History:*

Her mother's height is 64 inches and the father's height 69 inches; therefore, her mid-parental height is ~64" (father's height – 5 inches, averaged with mother's height). Her mother had menarche at age 13.

No history of short stature or pubertal delay.

# Part II: Next Steps

## *Physical examination:*

Sarah is a thin, but otherwise well-appearing adolescent girl.

Height: 62 ¼ inches, weight: 84 pounds, BMI: 15.2.

Vital signs: blood pressure 95/54, pulse 72.

No obvious skeletal disproportion.

Skin: clear, without comedones or other lesions.

HEENT: pupils round and equally reactive. Sclerae clear. Extraocular muscles intact. Oropharynx clear. No midline facial defects.

Neck: no goiter or lymphadenopathy.

Chest: Tanner 2 breast development. Lungs clear.

Heart: normal sinus rhythm, without murmur, gallop or rub.

Abd: soft, no hepatosplenomegaly or masses.

GU: Tanner 2 pubic hair. Normal external genitalia. Reddened, thin vaginal mucosa. Stool - negative for occult blood.

Neuro: nonfocal, normal reflexes, without delayed relaxation.

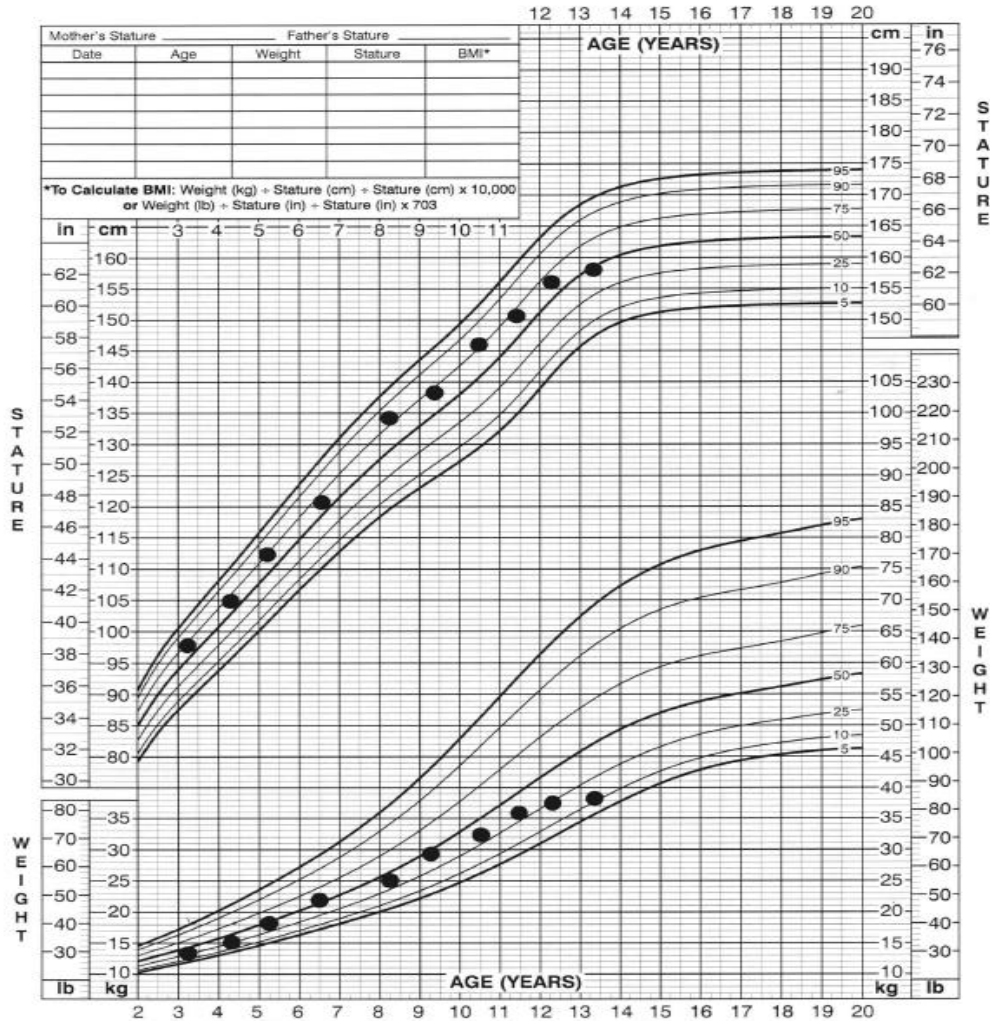
Spine: no scoliosis.



# Sarah's Growth Chart

2 to 20 years: Girls  
Stature-for-age and Weight-for-age percentiles

NAME Sarah  
RECORD # Before treatment



Revised and corrected November 28, 2000.  
SOURCE: Developed by the National Center for Health Statistics in collaboration with  
the National Center for Chronic Disease Prevention and Health Promotion (2000).  
<http://www.cdc.gov/growthcharts>



# Laboratory Results

- CBC - HCT 31% with MCV of 74 (other indices within normal limits), normal WBC and platelets
- ESR, liver function tests, electrolytes, BUN, creatinine, glucose, albumin, total protein, Ca, phosphorus all within normal limits
- Bone age (chronologic age 13 years) = 12 years (one standard deviation is 10 months)
- Thyroid function tests: free T4 1.02 ng/dl, TSH 1.8 uU/ml
- FSH 2.3 IU/L
- Tissue transglutaminase (TTG) > 112 EU/ml (negative < 20 EU/ml), IgA 182 mg/dL (normal 70-312 mg/dL)

# Part III: Epilogue

Sarah is currently age 14-and-a-half years old. She was referred to GI and had a small bowel biopsy following baseline lab testing which confirmed diagnosis of celiac disease. Sarah started a gluten-free diet following biopsy results. She has shown a good response to therapy with a marked acceleration of her growth velocity. Her breast and pubic hair development resumed within 6 months of initiation of this modified diet, and she just experienced menarche. Her repeat TTG was 18 EU/ml

# Growth chart after treatment

