John Snyder, MD
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EVALUATION OF POOR GROWTH
(A PLEA NOT TO USE THE TERM "FAILURE TO THRIVE")

Definition

"Failure to thrive": Carries a bad connotation for many families who are ***not*** failing
Old classification
- Organic vs Non-organic
  - Non-organic: growth deficiency without diagnosable medical cause
  - Organic: related to a specific medical illness

Newer designation
- Growth Deficiency -- defined in terms of growth chart criteria
  - <5th % in absence of constitutional delay
  - A fall across 2 or more percentiles
  - Weight-for-height < 5th %

Epidemiology

Can happen to a child from any socioeconomic group but more likely in families living below poverty
Office practice: ~ 90% of cases will have no associated medical illness
Hospital setting: ~ 70% will have no associated medical illness
3-5% of hospitalized children have growth problems

Normal Growth

Age	Daily weight gain	RDA (kcal/kg/d)
0-3 mo	26-31 g	108
4-6 mo	17-18 g	108
7-9 mo	12-13 g	100
9-12 mo	9 g	100
1-3 yr	7-9 g	100
4-6 yr	6 g	90

Differential Diagnosis

ILLNESSES	EXAMPLES
CNS	CP, congenital infection
Chronic inflammation	JRA
Congenital	Cleft palate, Turners, EtOH or drug exposure
Cardiac	Congenital heart disease
Endocrine	GH, thyroid
GI	Celiac, CF, Crohn disease, malabsorption, GER
Immunology	DiGeorge, immunodeficiency (AIDS)
Malignancy	ALL, Wilms, neuroblastoma
Metabolic	Acidosis associated illnesses
Pulmonary	BPD, bronchiectasis
Renal	UTI's, RTA, structural abnormalities
Other	Lead poisoning
NON-ORGANIC	Temperament Issues, Interaction Problems, Feeding Behaviors, Psychosocial Stressors

Historical Clues

Remember organic diseases
Neonatal: drug/EtOH exposure, ?SGA, ?IUGR
Nutrition: 24 hr recall
72 hr diary
intervals, volume, distractibility, care-givers, "grazing" vs established meals
Vomiting, stooling
Development
Behavioral issues: Interactions, sleeping, daycare or school performance

Psychosocial history

Family composition (changes?)
Employment status, financial status
Degree of social isolation
Family stresses
Cannot (should not) get all information in 1 visit

Physical Examination

Anthropometrics: Height, weight, and head circumference and percentiles
Weight-for-height, Serial measurements, Parental heights
Observe feeding
General: dysmorphic features
HEENT: examine soft and hard palates
Pulmonary and Cardiac: careful examinations
GI: includes careful evaluation of swallowing
CNS: hypotonia and spasticity
? signs of neglect
Developmental evaluation

Evaluation

Initial Evaluation

Stool: direct examination
Sudan stain, stool reducing substances and pH
occult blood
ova and parasites

Blood: CBC + differential count
electrolytes (esp CO_2)
? albumin
? serum immunoglobulin levels and HIV testing
? carotene
? fat soluble vitamins -- A,D,E,K
? Ca, Zn, Fe, Mg
cystic fibrosis screen

Urine: urine analysis

Other: sweat test

Trial of increased calories

Boost calories by 20-25% -- usually accomplished by concentrating formula or milk
May result in weight gain
May unmask malabsorption

Clues to further evaluation:

History/Physical Exam	**Diagnostic Considerations**
Spitting, emesis, feeding refusal	GE reflux
Diarrhea, fatty stools	Malabsorption, parasites, protein allergy
Wheezing, respiratory infections	RAD, aspiration
Recurrent infections	Immunodeficiency

If Wt/Ht < 5th %, obtain weekly weight checks.
If no progress, admit for inpatient evaluation:

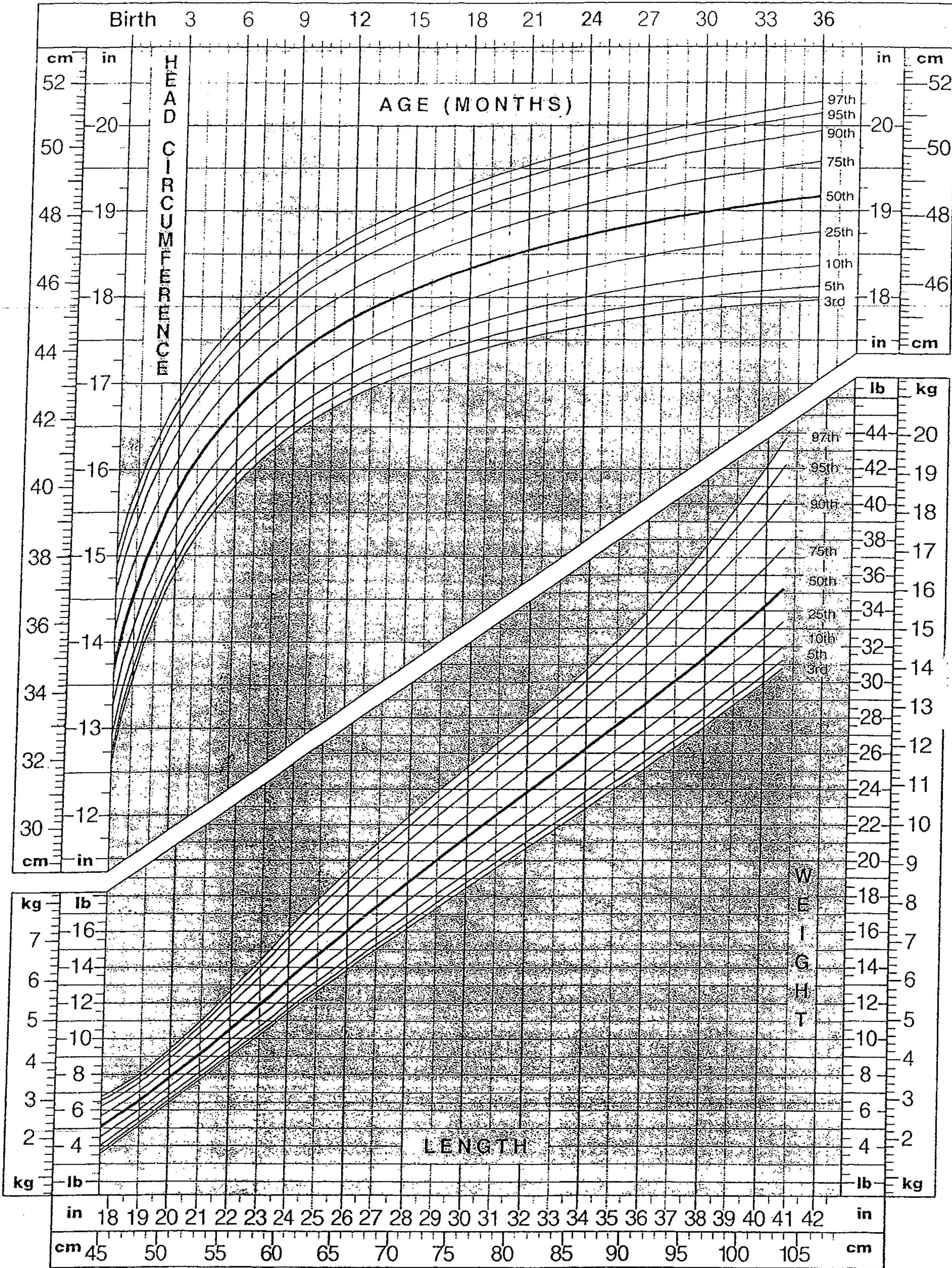
- Malabsorption work-up – 72 hr fecal fat
- Metabolic evaluation if indicated by screening labs
- Consider GER
- Consider EGD + biopsy

Bibliography

1. Olsen EM, Petersen J, Skovgaard AM, Weile B, Jørgensen T, Wright CM. Poor Growth (Failure to thrive): the prevalence and concurrence of anthropometric criteria in a general infant population, Arch Dis Child. 2007;92(2):109–14.
2. Maggioni A, Lifshitz, F. Nutritional management of failure to thrive. Pediatr Clin NA 1995;42:791-811.
3. Frank DA, Silva M, Neelman R. Failure to thrive: Mystery, myth and method. Contemporary Pediatrics. 1993; 10:114-131.
4. Jaffe AC. Poor Growth (Failure to thrive): current clinical concepts. Pediatr Rev. 2011; 32(3):100-7
5. Black MM, Dubowitz H, Krishnakumar A, Starr RH. Early intervention and recovery among children with failure to thrive: Follow-up at age 8. Pediatrics. 2007;120:59-69. .
6. Cole SZ, Lanham JS. Poor growth (failure to thrive): An update. Am Fam Physician. 2011;83:, 830-4

GIRLS: BIRTH TO 36 MONTHS
CDC US GROWTH CHARTS*

Name ______________________ Record # ____________



DATE	AGE	LENGTH	WEIGHT	HEAD CIRC.	COMMENT
	Birth				

* Adapted from the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000). Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, et al: CDC Growth Charts, United States. Advance data from vital and health statistics No. 314. Hyattsville, Maryland: National Center for Health Statistics, June 8, 2000.

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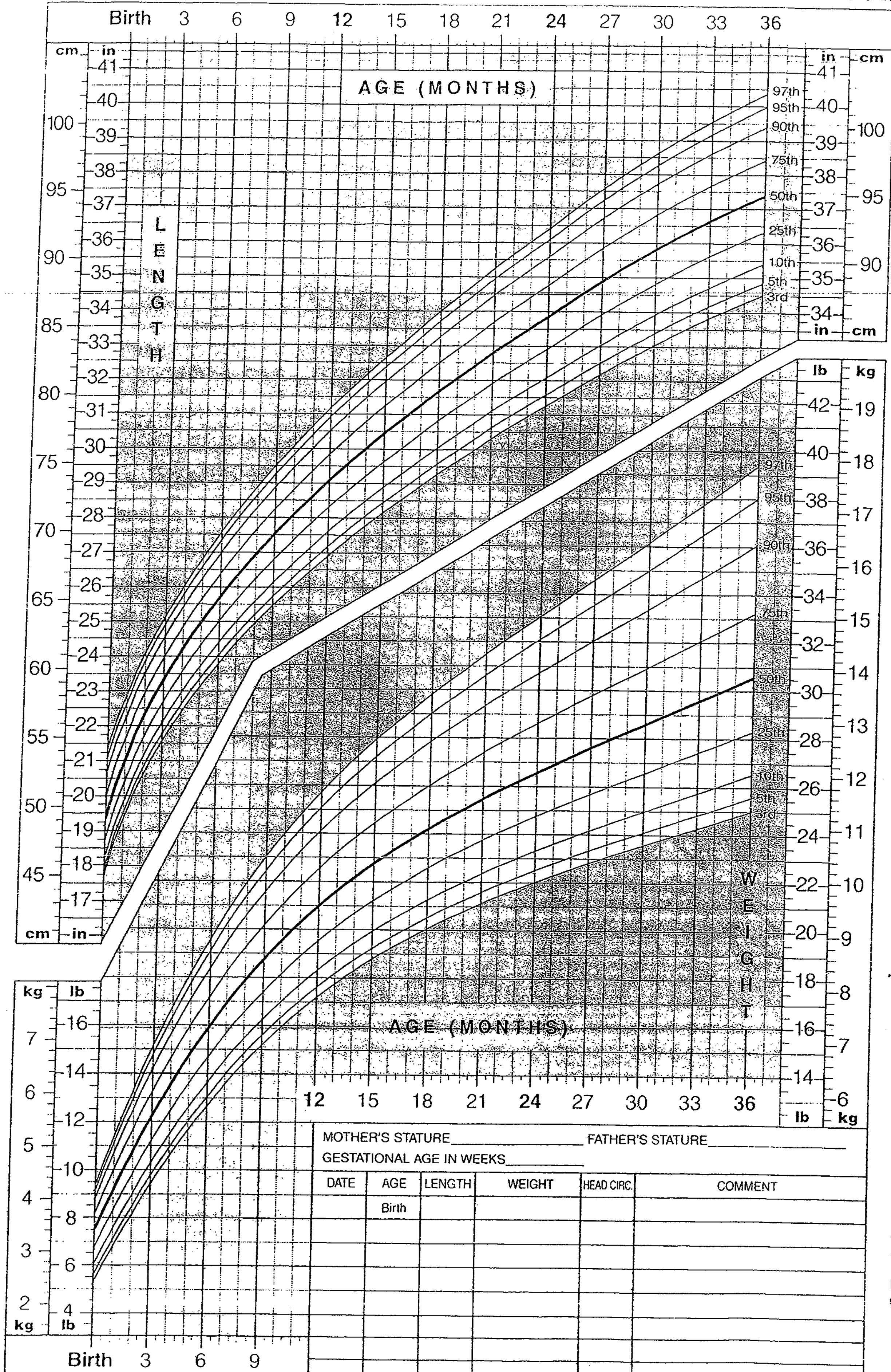

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