Growth Concerns for Children with Congenital Hyperinsulinism

Adda Grimberg, MD
Scientific Director,
Diagnostic & Research Growth Center
The Children’s Hospital of Philadelphia
Adda Grimberg, MD serves on the Steering Committee for the Pfizer International Growth Study database.
The GH/IGF axis

Insulin/IGF systems

Ligands:
- Insulin
- IGF-I
- IGF-II

Binding Proteins:
- IGFBP-1-6

Receptors:
- IR (IRA)
- Hybrid
- IGF1R
- IGF2R
Fetal growth

- **Determinants**
  - Pregnancy health, maternal health, placental sufficiency
  - Infant of a diabetic mother

- **First “diagnostic test”:** history
  - LGA, AGA, SGA
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• Fetal growth determinants to post-natal growth determinants

• Physiologic rechanneling
  • Catch-up growth
  • Catch-down growth
Normal growth (post-natal)

- Follows pattern
  - Fastest first 2 years of life
  - Steady age 3 years until puberty
  - Pubertal growth spurt
  - Stop

- Based on
  - Reference population
  - Family
  - Gender
Growth charts

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

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

*To Calculate BMI: Weight (kg) / [Stature (cm) - Stature (cm) x 10,000] or Weight (lb) / [Stature (in) - Stature (in) x 703]

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SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2003).
http://www.cdc.gov/growthcharts

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Measuring growth
Plotting growth
Plotting growth
Abnormal growth

- Height < -2 SD for population
- Height < 2 SD below parental target height
- Height falling across major %iles
- Slow growth velocity
  (< 2 inches or 5 cm per year)
Growth is the most sensitive physical sign of a child’s overall health. It is very nonspecific.
Processes that affect growth

- Genetic disorders
- Endocrine disorders
- GI diseases, Nutrition
- Systemic disorders
- SGA/IUGR
- Psycho-social deprivation

Normal growth
Sequence of pubertal events

Normal growth: sex differences

Girls’ peak growth rate: 11.5 years
Boys’ peak growth rate: 13.5 years


National Center for Health Statistics.
Evaluation of growth

- Objective: normal variant or disease?
- Pattern of growth (growth curves)
- Genetic expectation (midparental target height)
- Medical history
- Physical examination
- Laboratory/radiological analysis
- Treatment options
Bone age

Male, 8 years

Male, 14 years
Parental advocacy

- Prepare for the measurements.
- Review the plotting.
- If questions, ask.
- Keep the data going!
- Don’t over-emphasize height.
- Foster self-esteem.