

Your Adolescent Patient has an Eating Disorder....

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MD Program
UNIVERSITY OF TORONTO

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Presenter Disclosures

Faculty: Priyanka Chowdhury, MD, Joey Bonifacio, MD,
Patricia Windrim MD

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Mitigating Potential Bias

- No mitigation required

Disclosure of Commercial Support

- This program has received no financial support
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Learning Objectives

At the end of this presentation you should be able to

- Describe the features of eating disorders presenting in adolescence in the context of set point theory
- Develop a therapeutic approach to managing eating disorders in family practice settings
- Recognize the red flags that may require hospitalization or specialist intervention

Eating disorder prevalence

- How many of you have a personal connection with someone who has an eating disorder?
- Introduce yourself to the person next to you and share what you find most challenging about working with eating disorders.



Eating disorders are not about
food or slimness

They are about **self-worth** and a
sense of **power or personal
effectiveness**

Adolescent Identity

- Self-esteem
- Body Image
- Sexuality
- Autonomy
- Control



Erikson, Erik H. Dimensions of a New Identity: The Jefferson Lectures in the Humanities (W. W. Norton & Company, Inc., 1979)

Definitions

- Anorexia Nervosa: **addiction** to weight loss
 - Intense fear of weight gain
 - Restrictive eating / compensatory behaviors
- Bulimia Nervosa: **compulsive disorder**
 - Binge eating / compensatory behaviors
- Binge-eating Disorder: 20% of the obese
- Drunkorexics: skip meals to binge drink
 - Associated early cirrhosis

'Drunkorexia' on the rise at university campuses, including Canadian schools.

Global News October 14 2016

"Drunkorexia" a disturbing trend on college campuses

Dipali Rinker. University of Houston, Texas July 2016



The Canadian Context

80% of people with eating disorders started with **diETING**

25% of Canadian women of normal weight think they are obese

56% of women are on a diet.

1.5% adolescents have Anorexia Nervosa

4.5% have Bulimia Nervosa

Anorexia Nervosa Morbidity

- **27%** of girls 12-18 years old were reported to be engaged in **severely** problematic food and weight behavior.
- **6%** of adolescents suffer from either anorexia nervosa or bulimia nervosa: making it the **third** most common chronic health condition after Obesity (11.7%) and Asthma (8.1%) in teens

Canadian Health Measures survey 2014

Excess mortality, causes of death and prognostic The British Journal of Psychiatry (2009)

Fotios C. Papadopoulos, Anders Ekblom, Lena Brandt and Lisa Ekselius

Anorexia Nervosa Mortality

- The death rate associated with anorexia nervosa alone is more than **12** times higher than the overall death rate among young women in the general population
- The crude rate of all cause mortality in Anorexia Nervosa is **6%**

Canadian Health Measures survey 2014

Excess mortality, causes of death and prognostic The British Journal of Psychiatry (2009)

Fotios C. Papadopoulos, Anders Ekblom, Lena Brandt and Lisa Ekselius

Diabetic girls skip insulin to lose weight: **Toronto Star** Jan 22, 2008

- One in four of the diabetic girls had an eating disorder, compared with 10 per cent in the group without diabetes,
 - 356 girls with diabetes and 1,098 without
- The study showed 35 per cent of girls ages 16 to 22 admit to purposefully **stopping their insulin for weight loss.**
- 20 yr old became blind



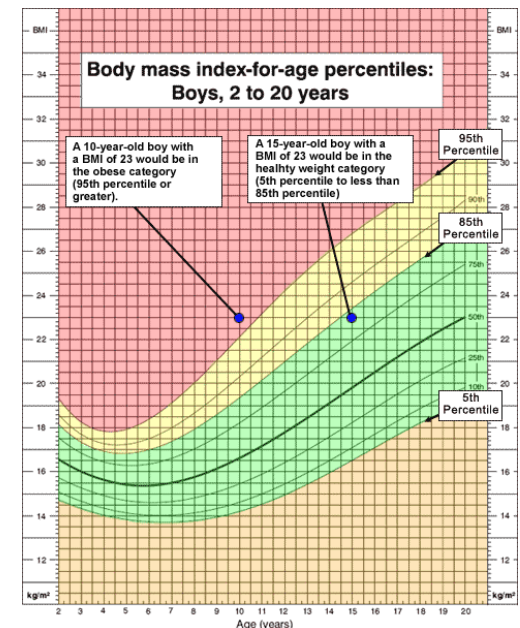
Set Point Theory



Cavanaugh, Carolyn. eating disorders: facts and statistics. In Lemberg, Raymond and Cohn, Leigh (Eds) (1999). Eating Disorders: A reference sourcebook. Oryx Press. Phoenix, AZ.

Set Point Theory

- The body is biologically programmed to weigh a certain amount, within normal limits
- The body defends a certain weight that is unique to each individual usually **within the BMI 18-25 range in adults**
- **BMI for age tables for teens**



The Biology of Human Starvation

US Army wanted to establish protocols for re-feeding starving POW from WW2 -1944-45

- 100 men volunteered: normal BMI
- 24 week period of Dietary Restriction
- Goal to lose 25% of body weight
- Recovery phase: different diets tried to prevent Refeeding Syndrome





Refeeding Syndrome

- Defined as the potentially fatal shifts in fluids and electrolytes that may occur in malnourished patients receiving refeeding
- The hallmark biochemical feature of refeeding syndrome is **hypophosphataemia**.
- May also feature abnormal sodium and fluid balance; changes in glucose, protein, and fat metabolism; thiamine deficiency; hypokalaemia; and hypomagnesaemia.

Refeeding syndrome: what it is, and how to prevent and treat it

[Hisham M Mehanna](#) BMJ 2006

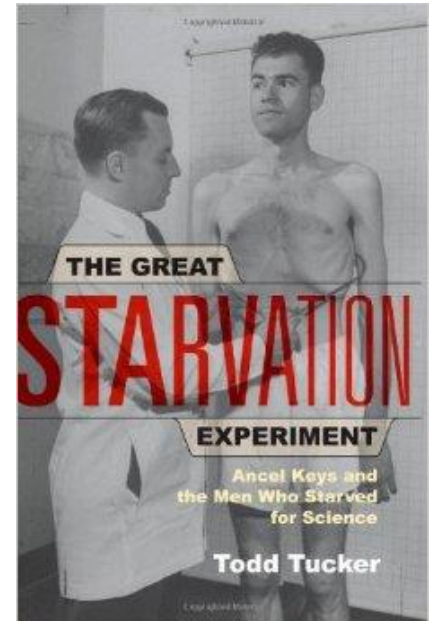
Effect on Fluid Balance

- The introduction of carbohydrate to a diet leads to a rapid decrease in renal excretion of sodium and water.
- If fluid repletion is then instituted to maintain a normal urine output, patients may rapidly develop fluid overload. This can lead to congestive cardiac failure, pulmonary oedema, and cardiac arrhythmia.

Ancel Keys Study

Starvation phase (24 weeks)

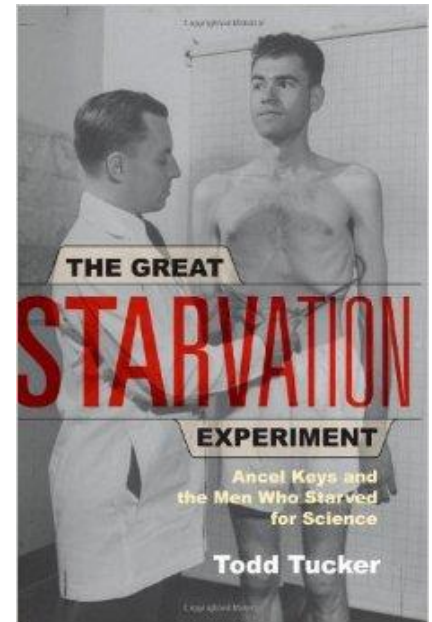
- Decreased Basal Metabolic Rate
- Decreased temperature: fingertips
- Bradycardia: $< 40/\text{min}$
- Hypotension: $< 80 \text{ mmHg}$ /postural drop 20 mmHg
- Lethargy
- Headaches



Psychological Effects

Starvation Phase:

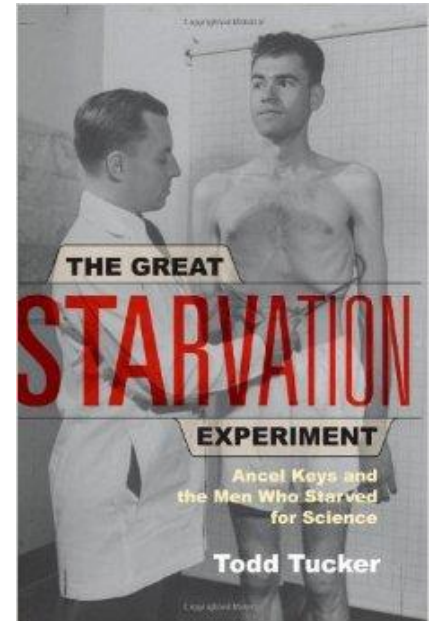
- Depressed
- Increased Irritability
- Impaired concentration/judgment
- Reduced libido
- Nail-biting
- Preoccupation with food
- Increased use of coffee, cigarettes, spices, gum
- Sleep disturbance: hyperarousal



Physiological effects

Starvation Phase:

- Cold intolerance
- Stomach Shrinks
- Slowed Gastric emptying: 4-5 hrs
- Constipation
- Sodium retention
- Fluid Retention: starvation edema



Physiological signs

Starvation Phase:

- Lanugo
- Hypercarotenemia: deficiency Vit. A
- Increased Adrenalin levels
- Dehydration
- PO₄/ K /Mg decreased



Figure— Yellow pigmentation resulting from carotenemia. The patient's hand showing yellow skin (bottom) is compared to a normal-color hand (top).

Re-feeding phase

- Consumption of large amounts of food without feeling satisfied
- Mimics the physiology of bulimia
- Returned to their original weight
- If too emaciated: cardiovascular collapse from fluid overload and reduced heart muscle

Patient Education Conclusion

- Symptoms of Starvation are those of eating disorders
- The body is not reprogrammed at a lower set point once weight loss is achieved
- The body has a strong biological drive to defend its target weight
- To maintain a lower BMI than normal starvation must continue



Case History

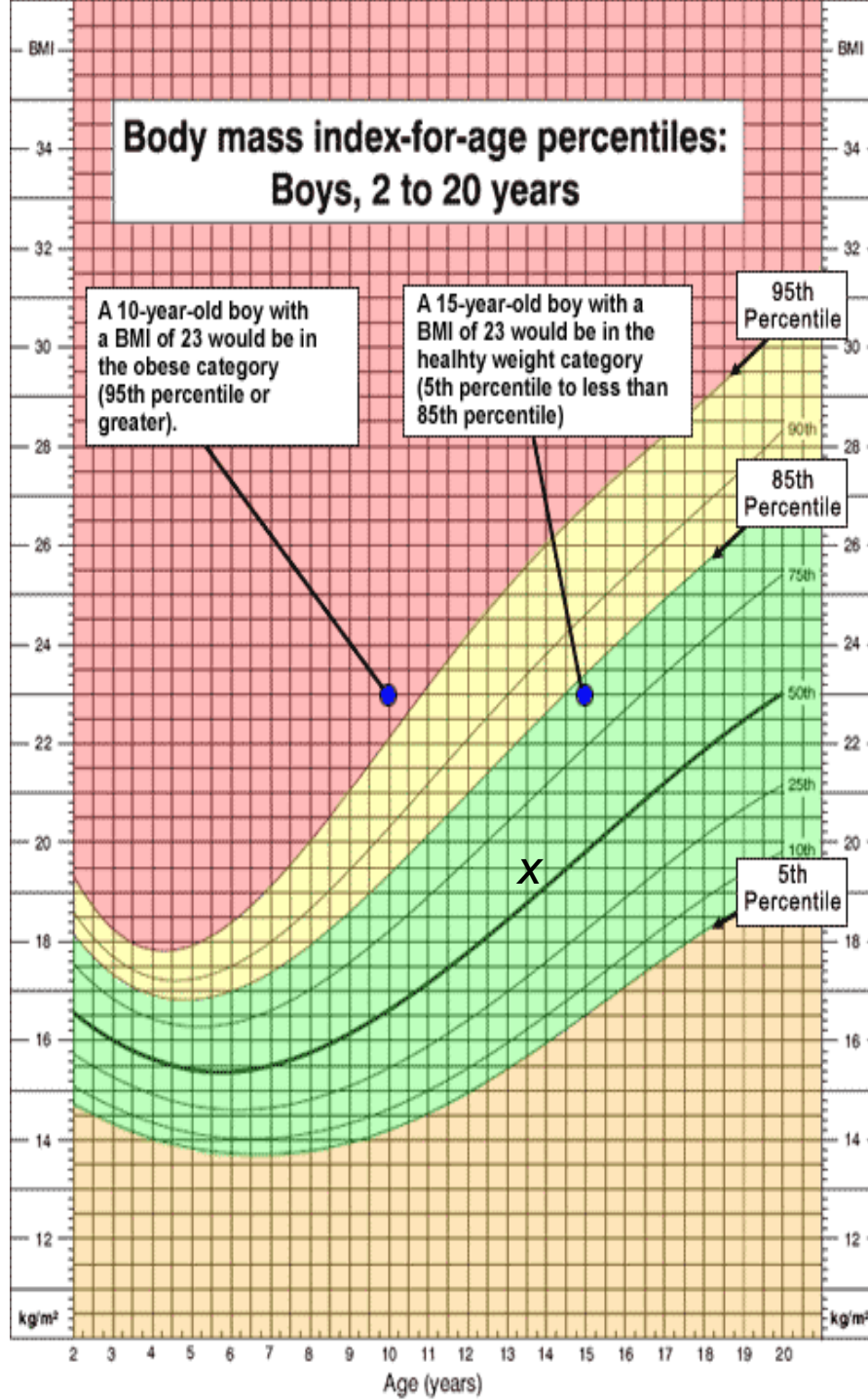
Sam is a 14 year old who has come to your office for his annual physical.

- When you checked his height and weight you noted that his BMI is 15.9
- On questioning him about his eating habits you discover that he skips breakfast, rarely has time for lunch but eats a good meal at dinner time because “Mom is a health food freak and watches me like a hawk”.

Body mass index-for-age percentiles: Boys, 2 to 20 years

A 10-year-old boy with a BMI of 23 would be in the obese category (95th percentile or greater).

A 15-year-old boy with a BMI of 23 would be in the healthy weight category (5th percentile to less than 85th percentile).

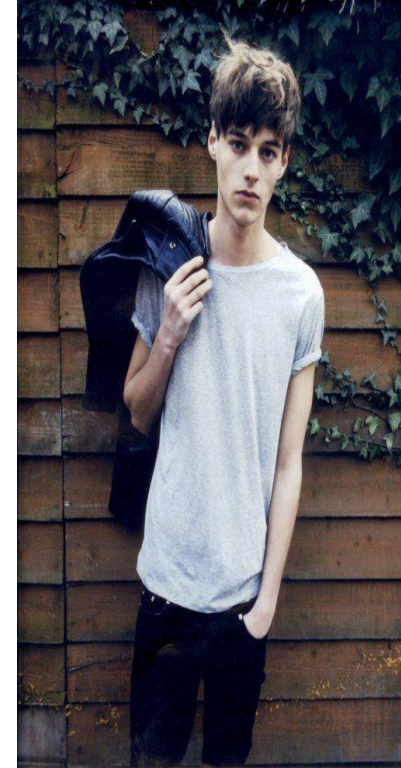


Sam's Measurements

- Height: 160 cm
- Weight: 50.4 kg
- BMI: 19.7 (20th centile)

One year ago

- Height 150 cm
- Weight: 50 kg
- BMI: 22.2

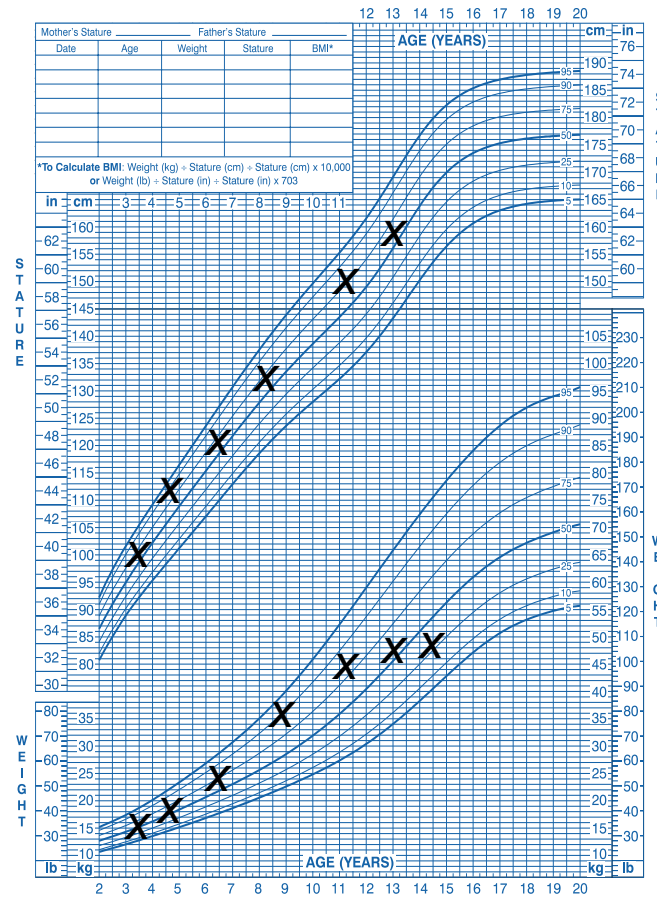


Sam's Growth chart

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

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Published May 30, 2000 (modified 11/21/00).
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>



SAFER • HEALTHIER • PEOPLE

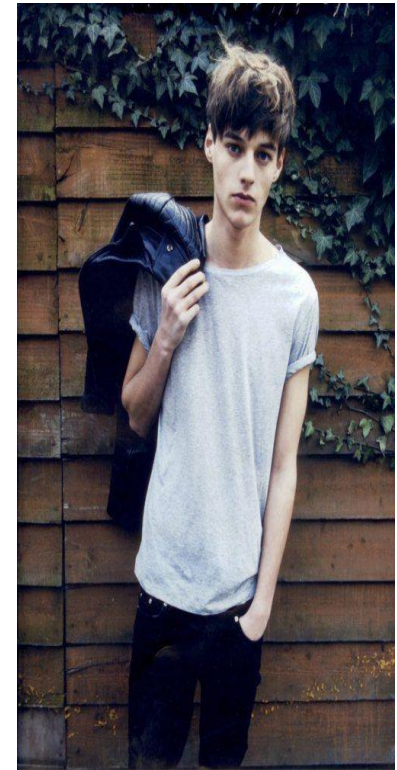
Next steps

- What other questions would you like to ask Sam?
- What would your assessment and plan include?



Sam's complaints

- Fatigue
- Cold Intolerance
- Palpitations
- Dizziness when he stands up
- Constipation
- Abdominal Bloating

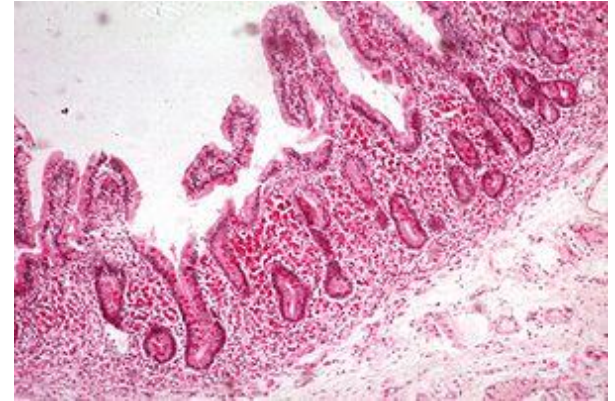


Screening for Eating Disorders

- **SCOFF**
- Do you make yourself **Sick** because you feel uncomfortably full
- Do you worry that you have lost **Control** over how much you eat
- In 3 months have you lost **Over** 15 lbs
- Do you think you are **Fat** when others don't
- Does **Food** dominate your life

Differential Diagnosis

- Diabetes
- Hyperthyroidism
- Peptic Ulcer Disease
- Inflammatory Bowel disease
- Malignancy
- Coeliac Disease, malabsorption
- Depression



Compensatory Behaviors

- Excessive Exercise
- Vomiting
- Laxative abuse
- Diuretic abuse
- Stimulant abuse
- Thyroid replacement
- Energy drinks



"You don't have anorexia, you just want to look like a celebrity": perceived stigma in individuals with anorexia nervosa
Gina Dimitropoulos et al.
Journal of Mental Health
: 11 Dec 2015

Signs of Compensatory Behaviors

- Russell's sign
- Dental enamel erosion
- Parotid Gland enlargement
- Bloodshot eyes
- Electrolyte changes?



Medical signs

- Emaciation
- Muscle wasting
- Lanugo
- Hair Loss
- Starvation edema
- Carotenemia: Vit A def
- Bradycardia
- Hypothermia <35
- Postural Hypotension.



Initial Lab Investigations

- Serum electrolytes
- LFTS- AST, ALT, Alkaline phosphatase
- INR
- Serum creatinine, BUN eGFR
- Urine for ketones
- Serum total protein, albumin
- Serum magnesium and phosphate
- Tissue Transglutaminase Antibodies

Other investigations

- CBC- Anemia Leukopenia Thrombocytopenia in 33% to 85%
- TSH
- Serum Glucose
- Serum Calcium, 25-hydroxyvitamin D
- Testosterone in males
- Pregnancy test in females
- ECG



Therapeutic Approach

Clinical Management

- Three primary issues:
 - Restoring weight
 - Modifying distorted eating behavior
 - Addressing the psychological and family issues
- Treatment methods:
 - Nutritional rehabilitation
 - Psychotherapy
 - Medication

Nutritional Rehabilitation

- Weekly visits in beginning
- Avoid major increases in nutrition
 - Avoid refeeding syndrome
 - Increase intake by one meal or snack / week
- Weight gain targets
 - Outpatient: 1kg / month
 - Inpatient: 1kg / week
- Physical activity must be monitored as well and restricted if it interferes with weight gain
- Keep scales in home (?)

Medical Follow-up Visits

- Outline

- Interim 24 hour food history
- Physical activity history
- Screen for red flags
- Urine (dehydration, water loading)*
- Weight (back to scale?)*
- Orthostatic vitals*

*staff

Medical Follow-up Visits

- Plan
 - Increase nutrition
 - Decrease activity
 - Bloodwork (electrolytes if suspected vomiting, refeeding)
 - Follow-up – closer or spread apart
 - Liaise with tertiary pediatric centre?
 - Emergency department for possible hospitalization?

Nutrition Rehabilitation Suggestions

- Increase caloric intake slowly
 - Recommend: Start at 500 calories more than the amount required to maintain present body weight
 - Rationale: Avoid refeeding syndrome
- Help parents plan in advance
 - Recommend: Future meal planning: including what? Where? when? Minimal choices
 - Rationale: Give an ED an inch and it will take a mile
- Referral
 - Experienced dietician/nutritionist

Nutrition Rehabilitation Suggestions

- May be necessary to space meals
 - Recommend: Three meals and three snacks
 - Rationale: Avoid physical and psychological discomfort in somebody who is severely underweight
- Patients are often observed after meals
 - Recommend: Usually 30 minutes
 - Rationale: Avoid vomiting
- Meal support to be provided
 - This is not meal SUPERVISION

Meal Support

- <https://www.youtube.com/watch?v=l7gyifpv4o4>

Working with Schools

- Will not be first time that school is working with a student with ED
- Issues:
 - Disclosure of eating disorder to school
 - Physical activity
 - Meals and snacks
 - Reintegration into school (post-admission)

Disclosure to School

- Helpful for teachers and school staff
 - Maybe missing school regularly for appointments
 - Other children may have questions about Sam
- School triggers for current and future students
 - Health class modifications

Physical Activity

- School
 - Long distances/Stairs
 - Walking A → B okay
 - Elevator?
- Physical Education
 - Difficult– change rooms, swimming
 - Usually no physical activity in beginning

Meals & Snacks

- Meal support
 - School social worker – training?
 - Family member – may be extended family
- Location
 - Classroom
 - Separate room
 - Home (account for time and physical activity)

Reintegration

- May integrate slowly or all at once
 - Advantage and disadvantages
 - Each family is unique
 - Choose some easier classes and phase in other ones over time
- Factors to consider
 - Questions from other students
 - Sensitive topics (nutrition, physical activity, mental health)

Psychotherapy for AN

- May refer for psychotherapy while having nutritional rehabilitation
 - Few well-controlled studies
- Ideally psychotherapy should take place when weight-restored
- Trusting relationship with therapist is key

Family-Based Therapy (FBT)

- Problem-focused, strength-based therapy
- Effective in 50 – 75% of adolescents, who in randomized trials achieved weight restoration by the end of treatment and maintained it for up to five years
- Unified parental action
- Family
 - not the cause of the disorder
 - a positive resource in the adolescent's weight restoration and return to normal eating and health

Medical Management

- Anorexia nervosa
 - medications have not generally proven themselves to be remarkably effective for the treatment of AN
- Bulimia nervosa
 - TCAs, MAOIs, trazodone, and the SSRIs have demonstrated benefit in the treatment of binge/purge behavior in BN
 - Fluoxetine which has been approved by the FDA for the treatment of adults with BN in both acute and maintenance treatment at a dosage of 60 mg per day
 - Should be continued for at least one year among those who respond positively to the medication within the first eight weeks

Self-care in Providing ED Care

- Acknowledge that providing ED care is very demanding and challenging
 - Difficult interactions with patient and parents
 - Resources limited
 - No immediate satisfaction
- Peer supervision
- Structure clinics appropriately (ex. 1 ED slot)

What weight am I look for?

Setting Progress Weight

Anorexia Nervosa DSM-5

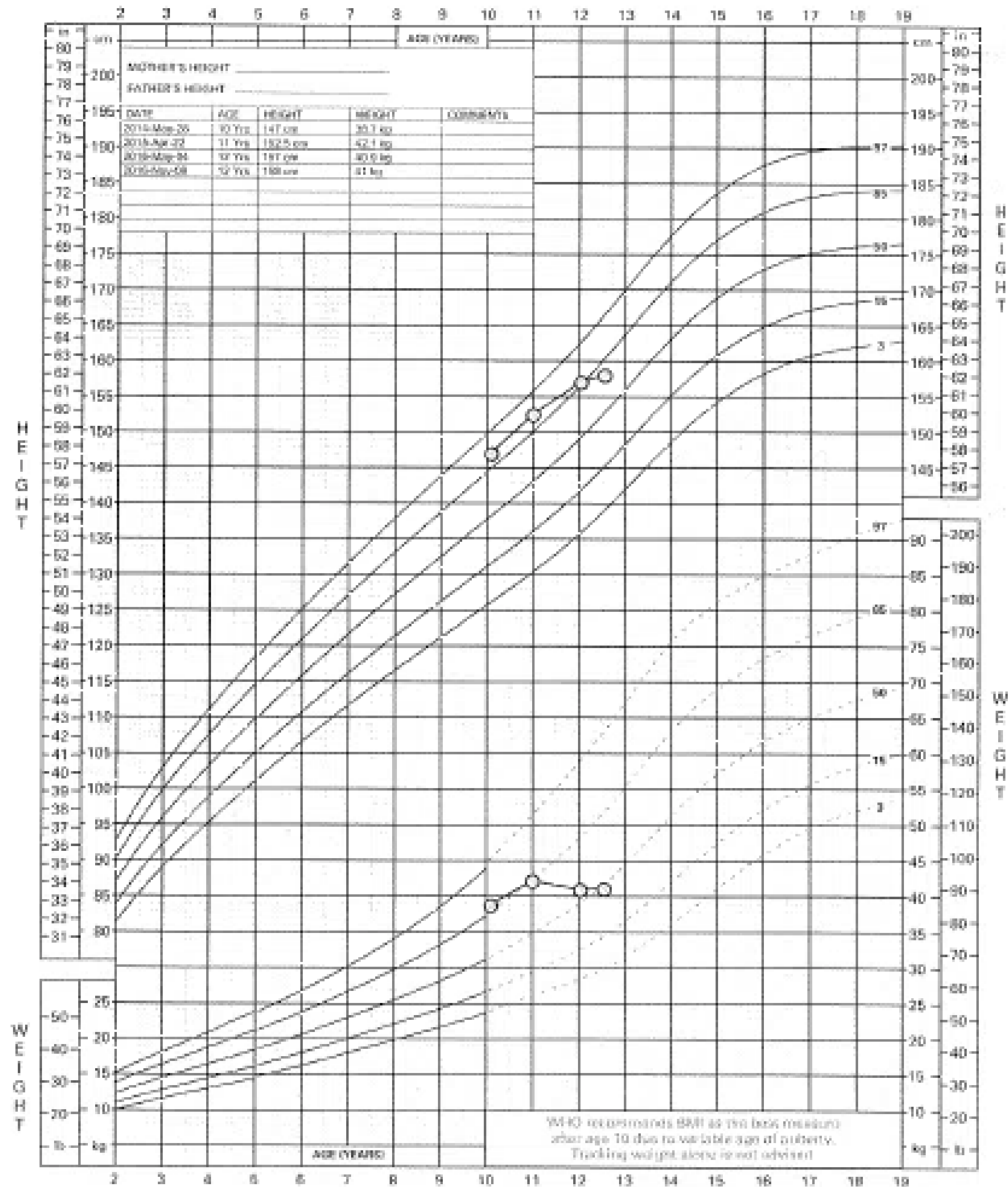
- Criterion #1:
 - Previous: Less than 85% ideal body weight
 - Current: Persistent restriction of energy intake leading to significantly low body weight (in context of what is minimally expected for age, sex, developmental trajectory, and physical health)

WHO GROWTH CHARTS FOR CANADA

BOYS

2 TO 19 YEARS: BOYS

Height-for-age and Weight-for-age percentiles

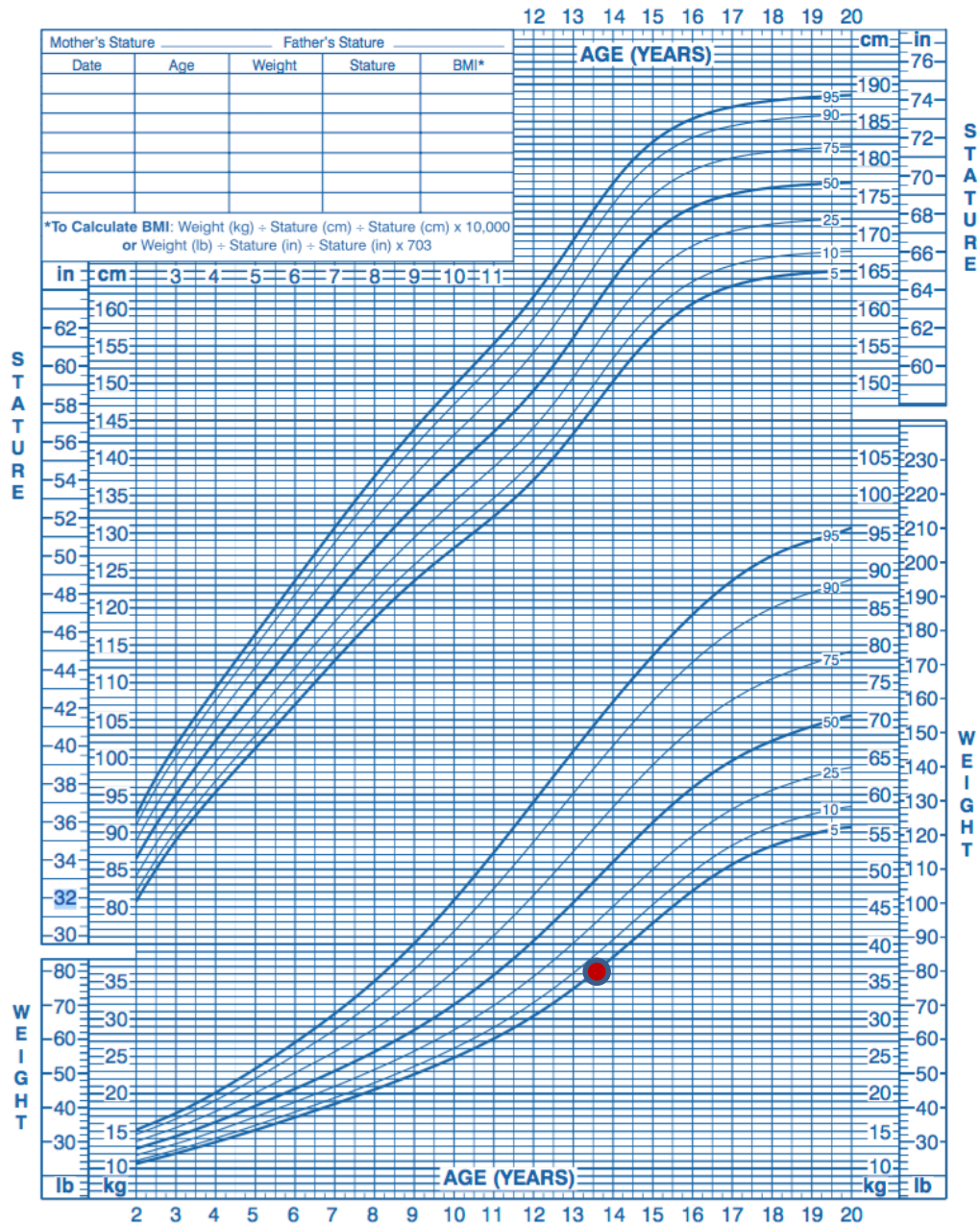


2 to 20 years: Boys

Stature-for-age and Weight-for-age percentiles

NAME _____

RECORD # _____



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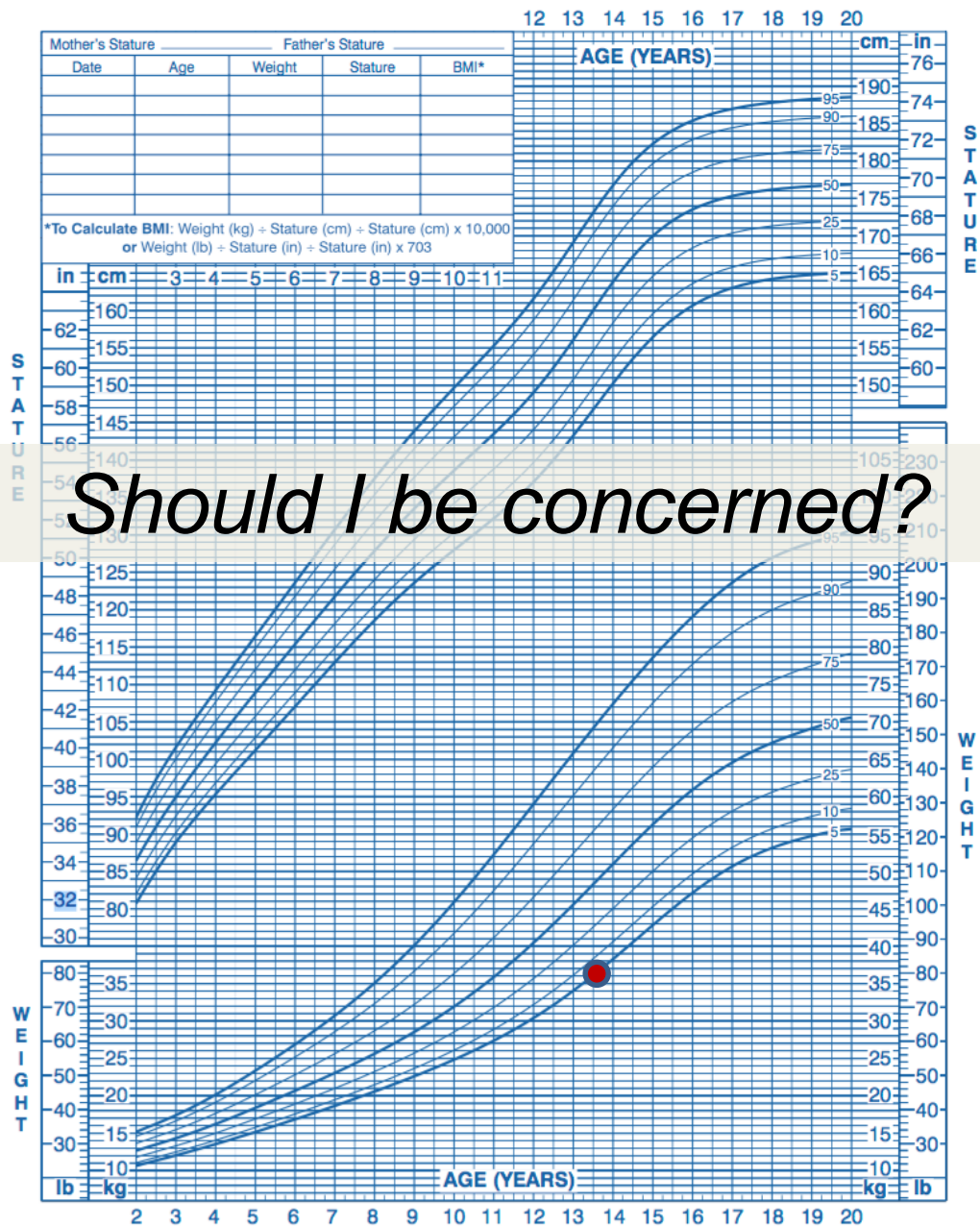


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Should I be concerned?

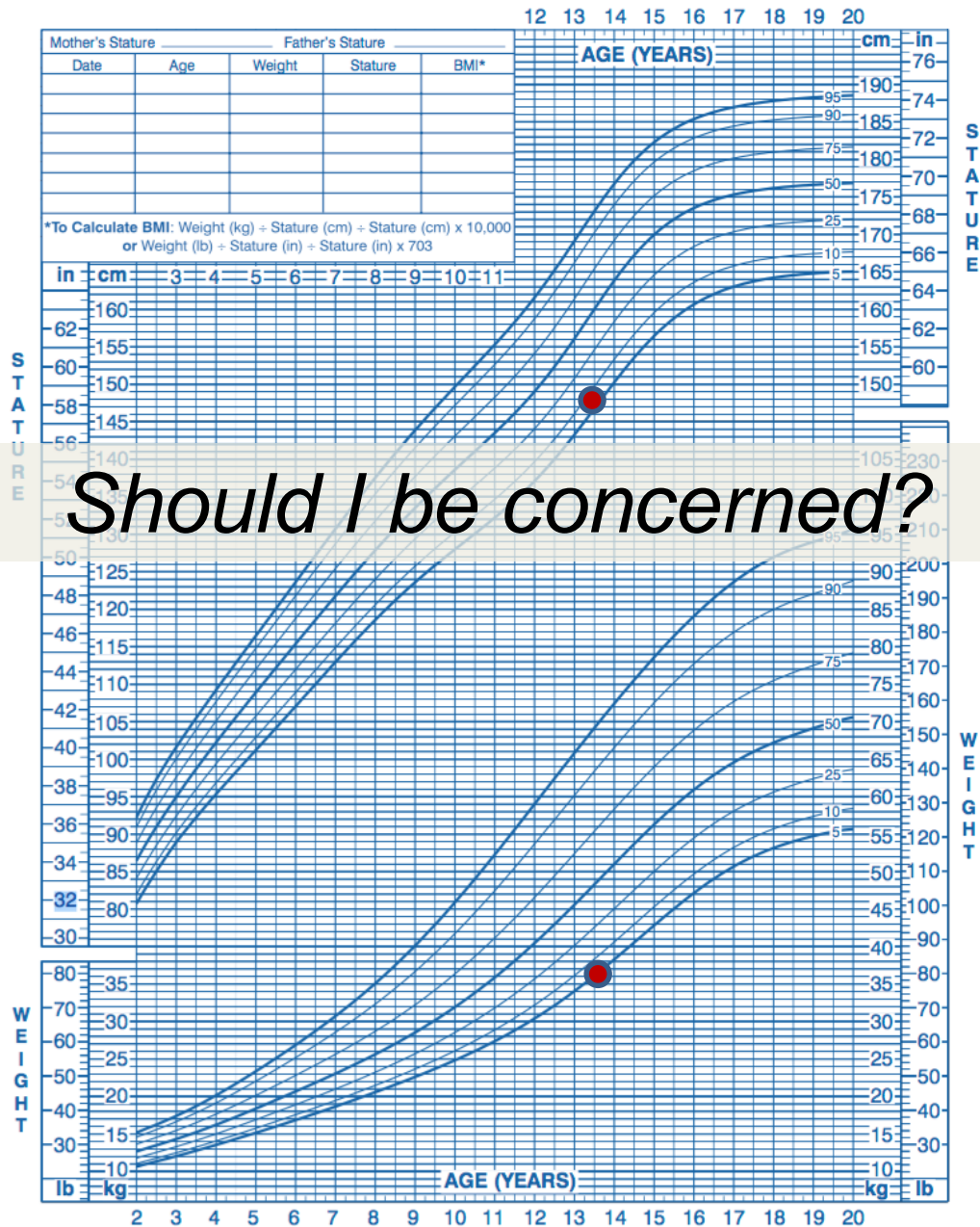
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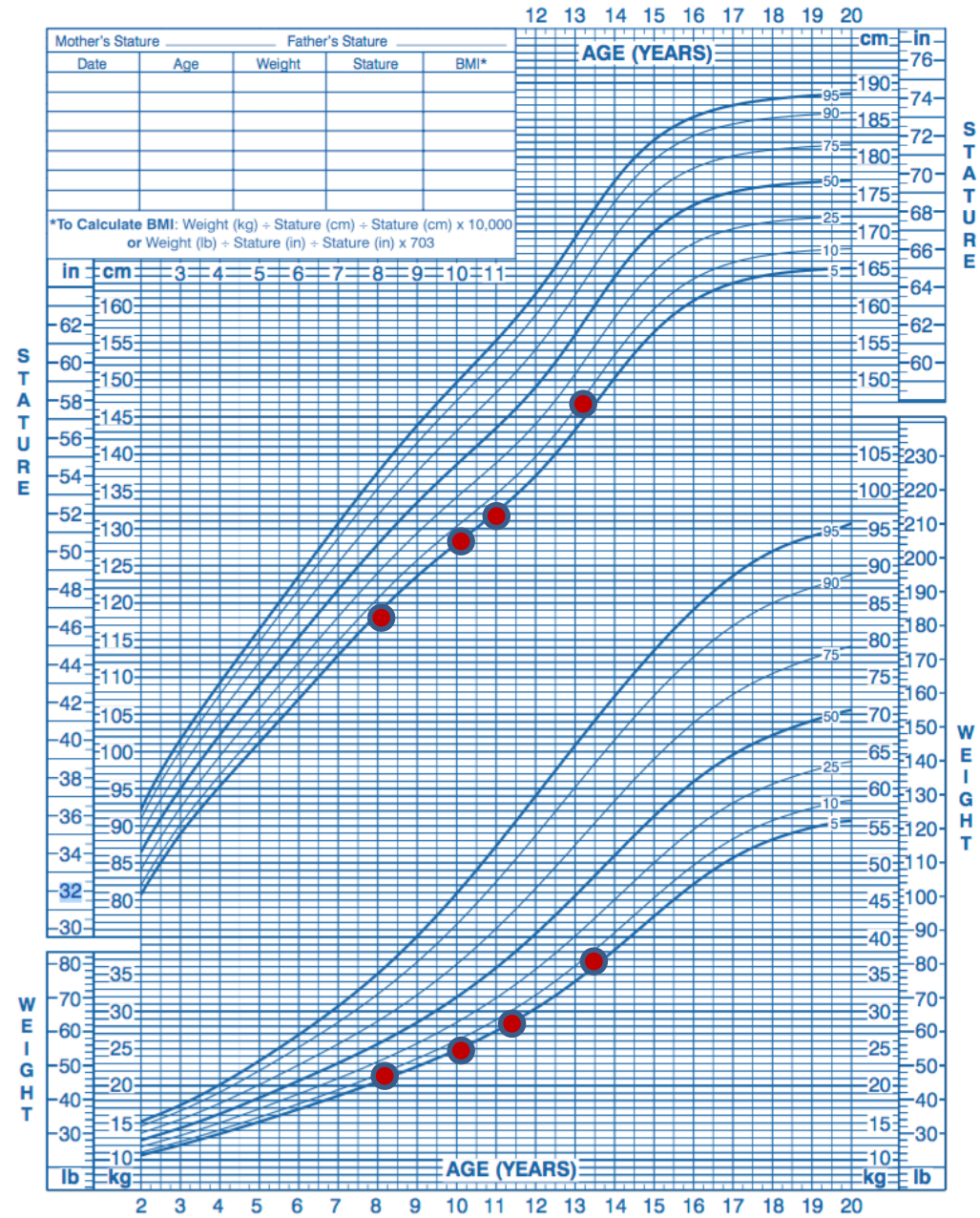
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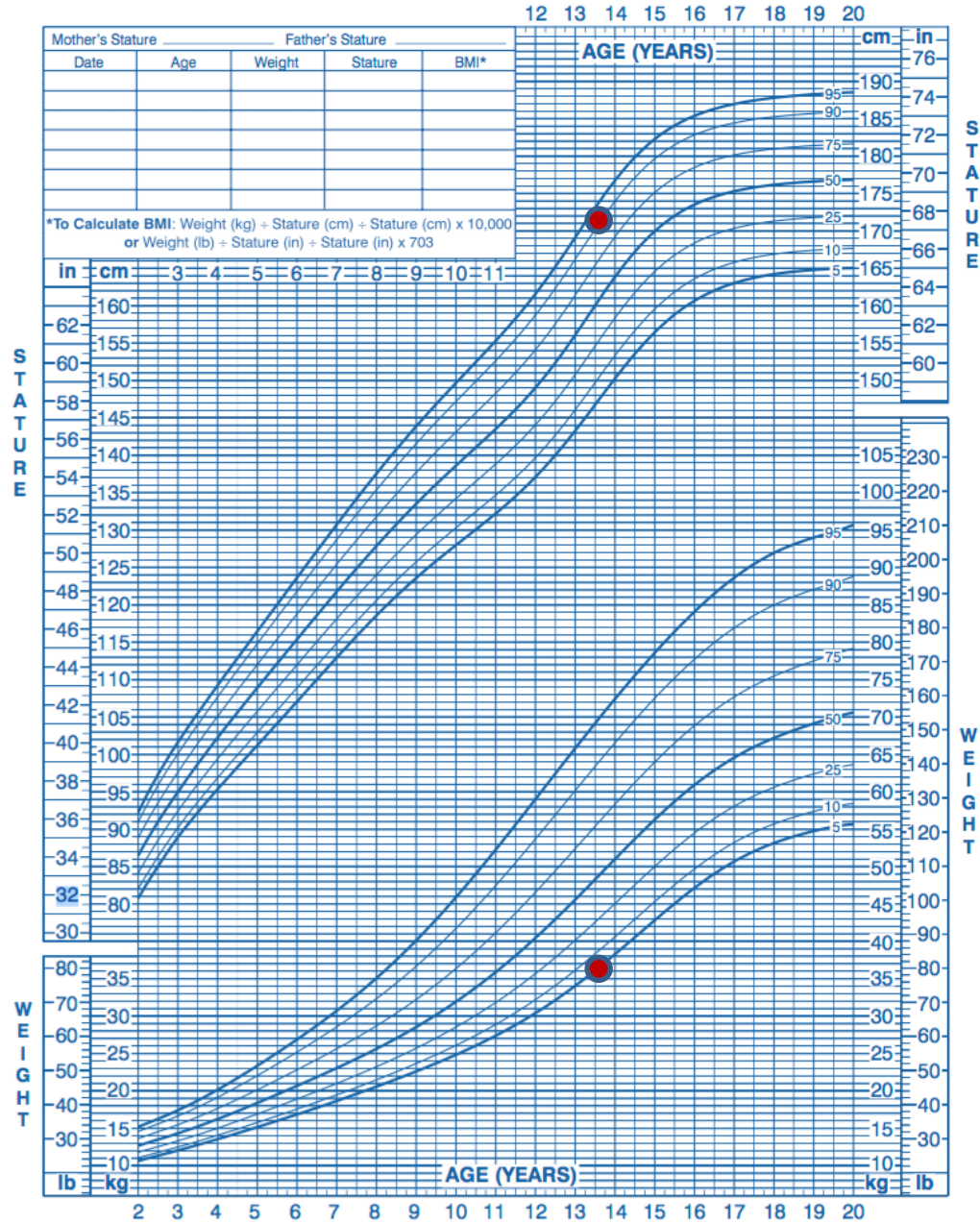


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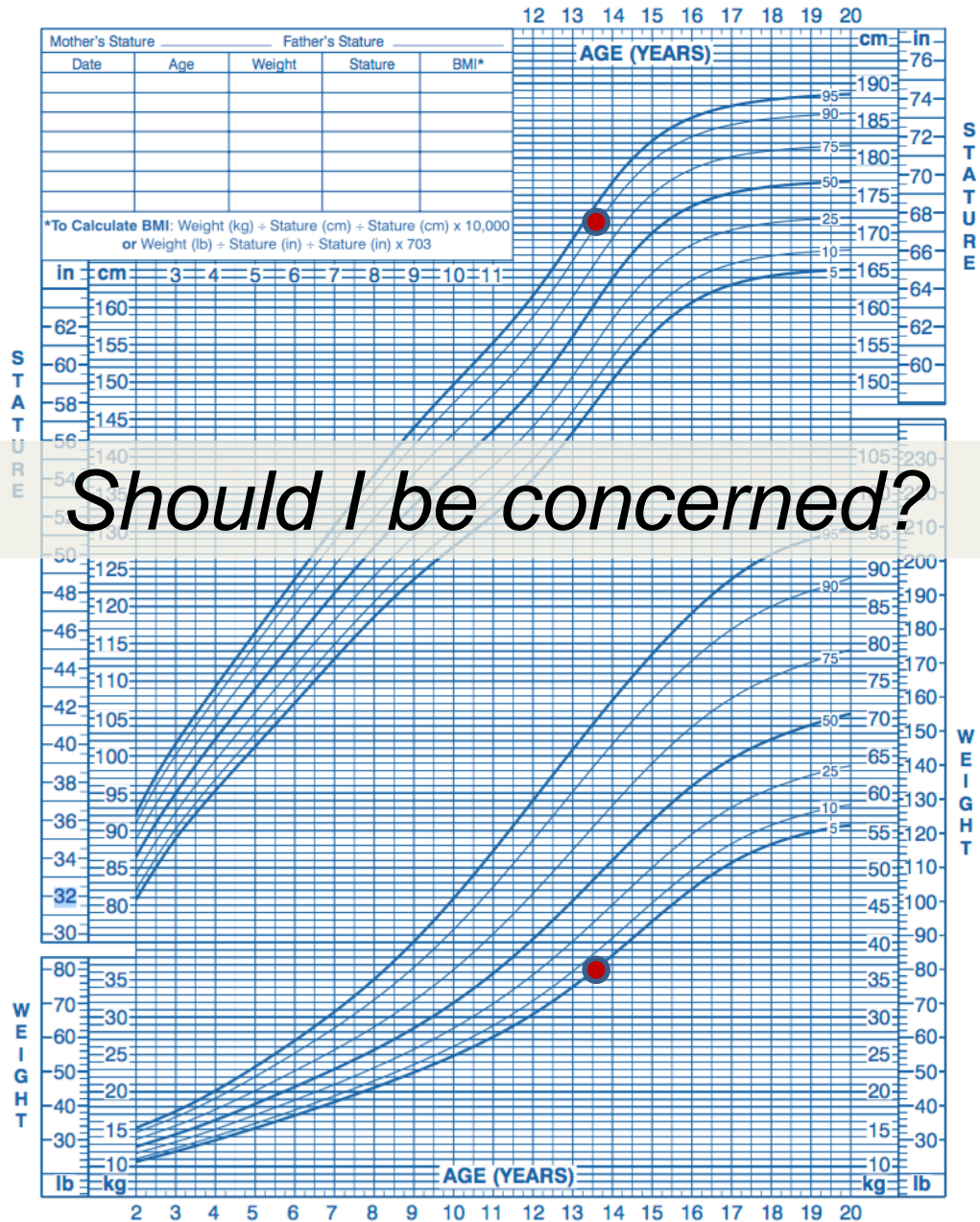


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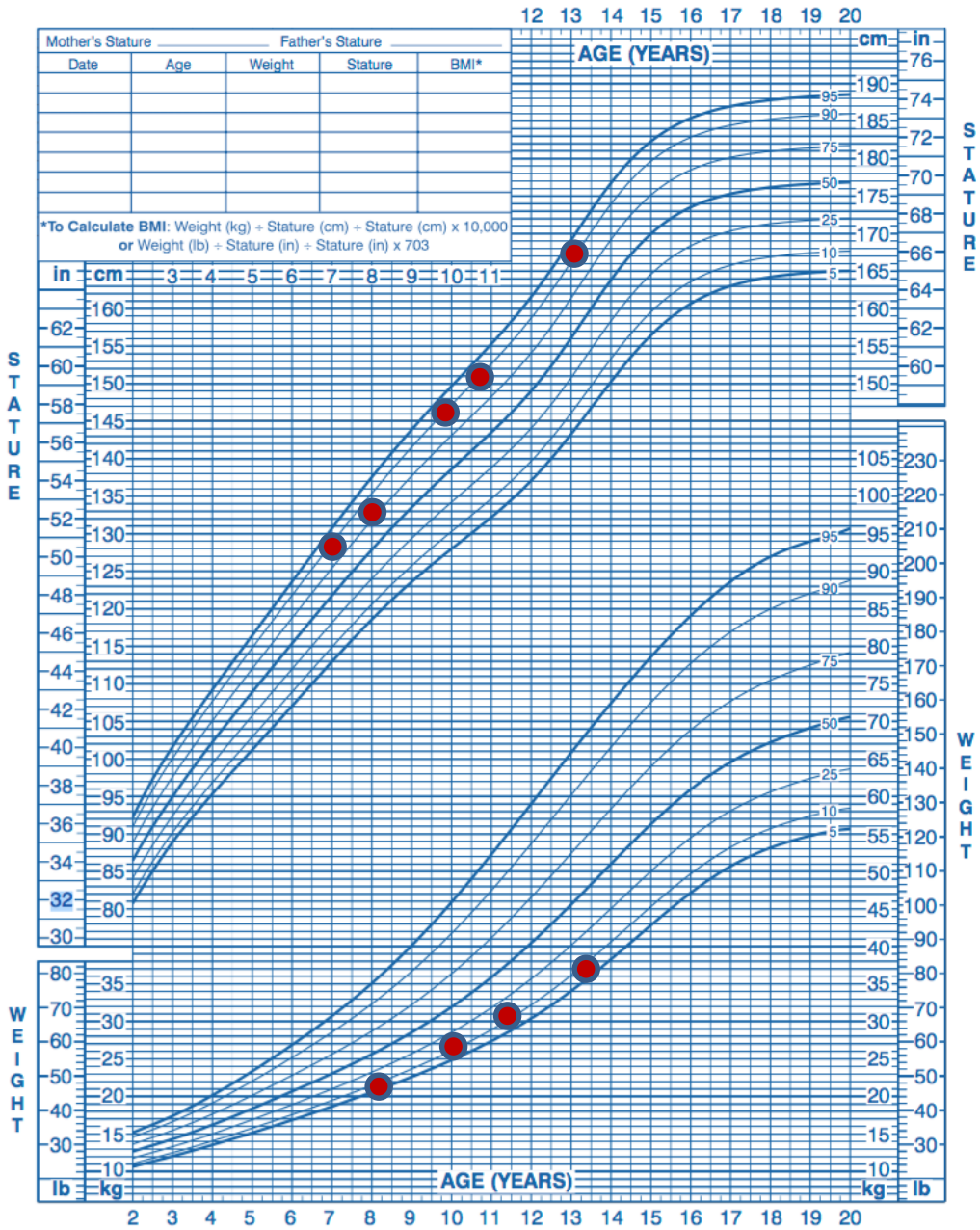
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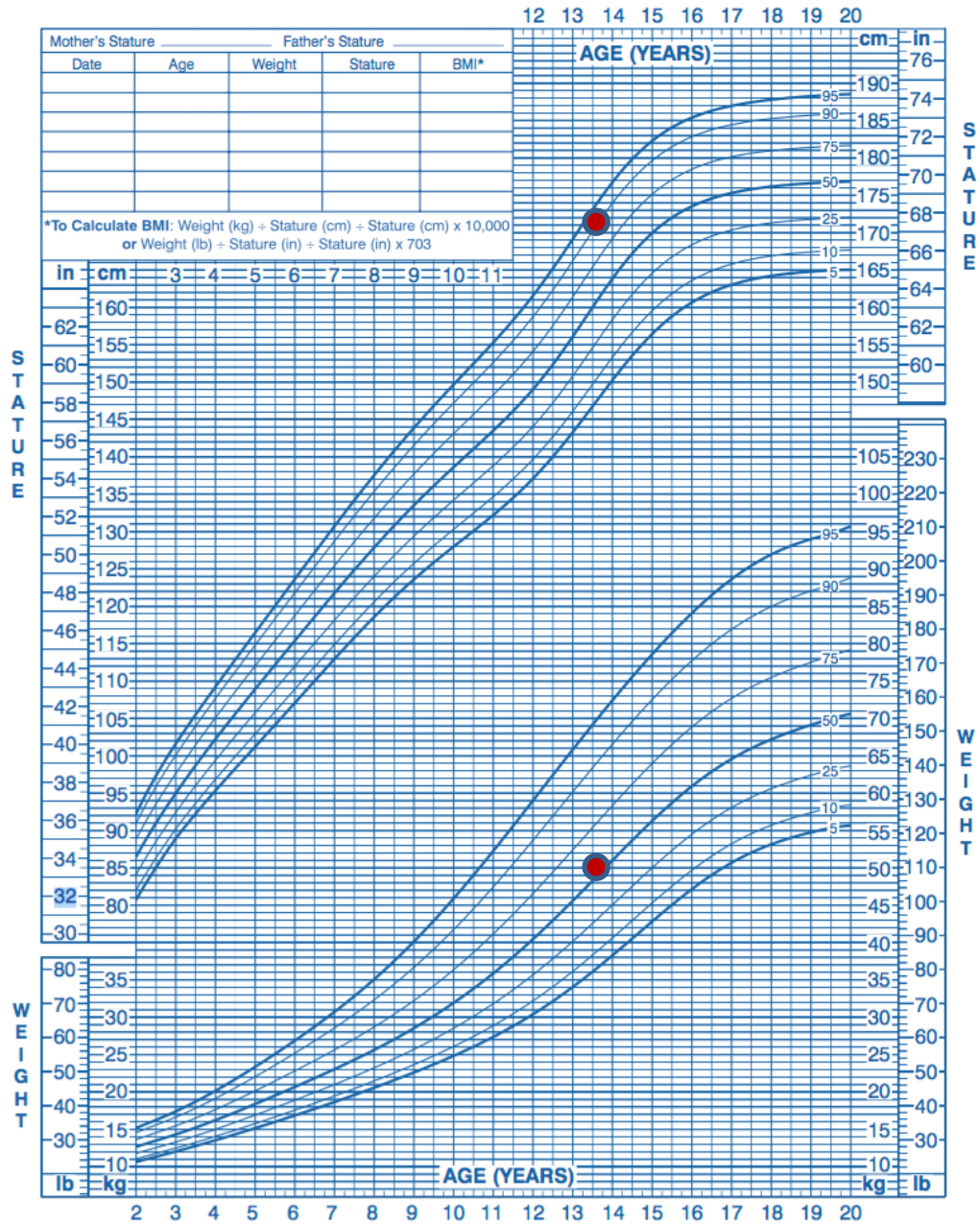


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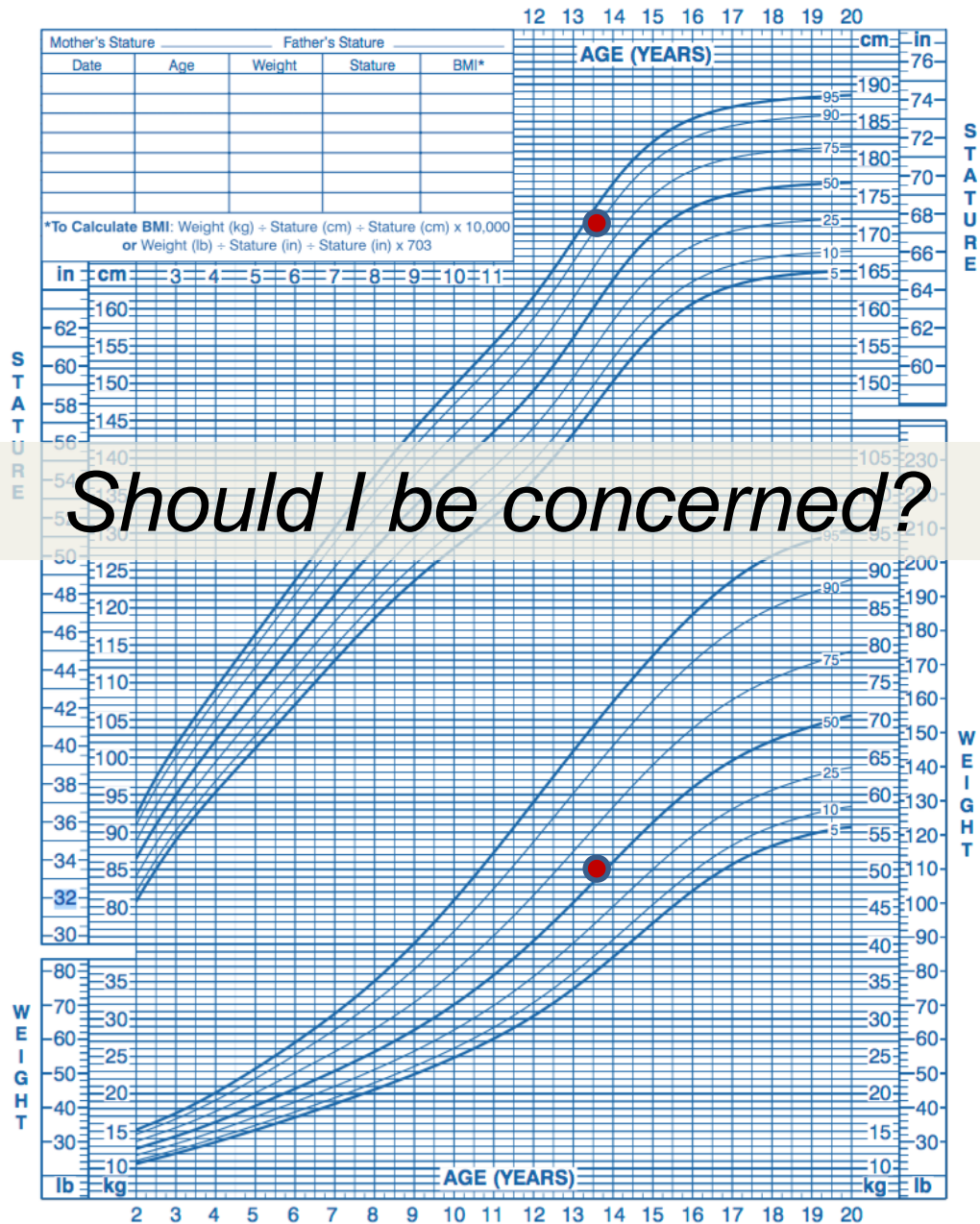


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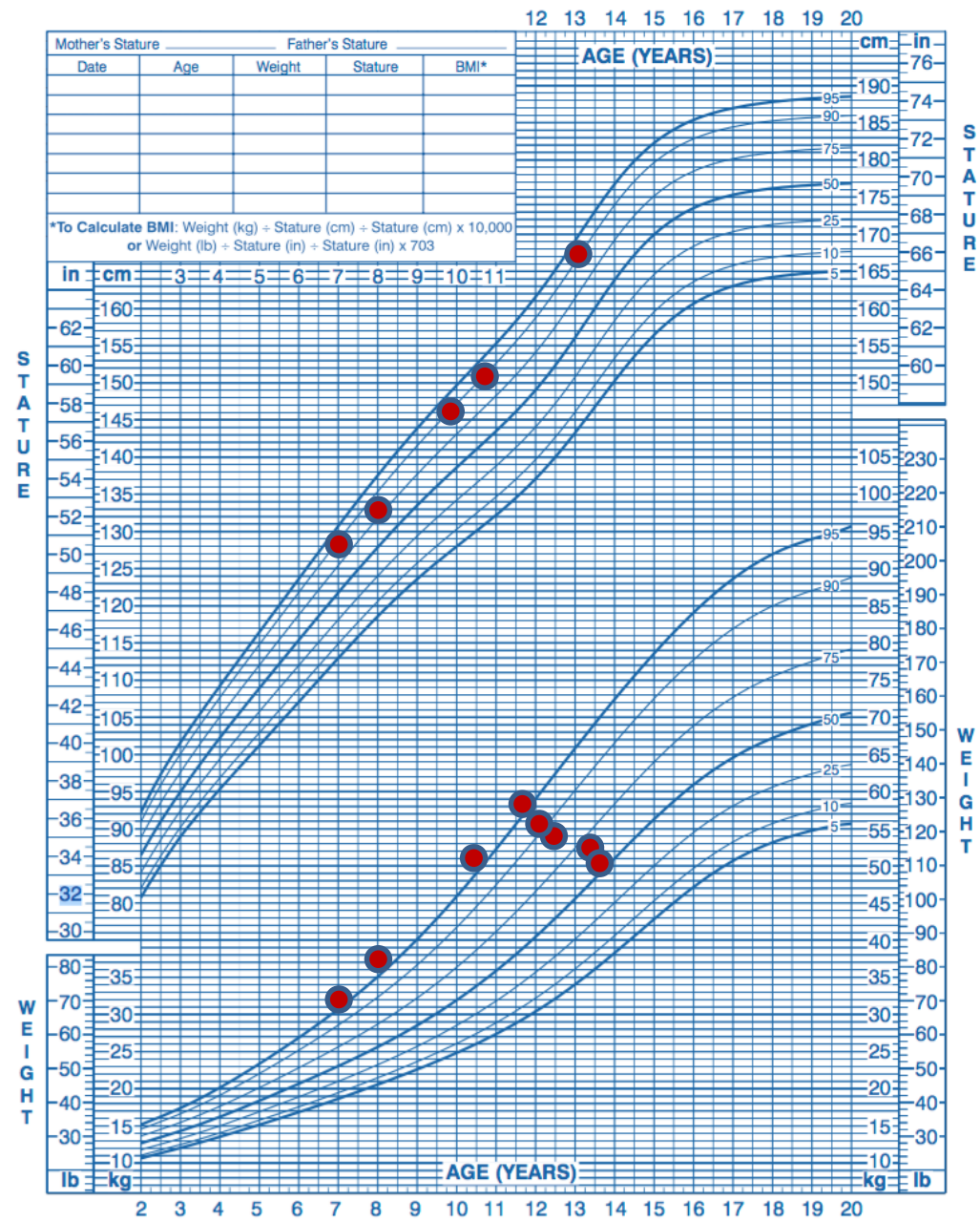


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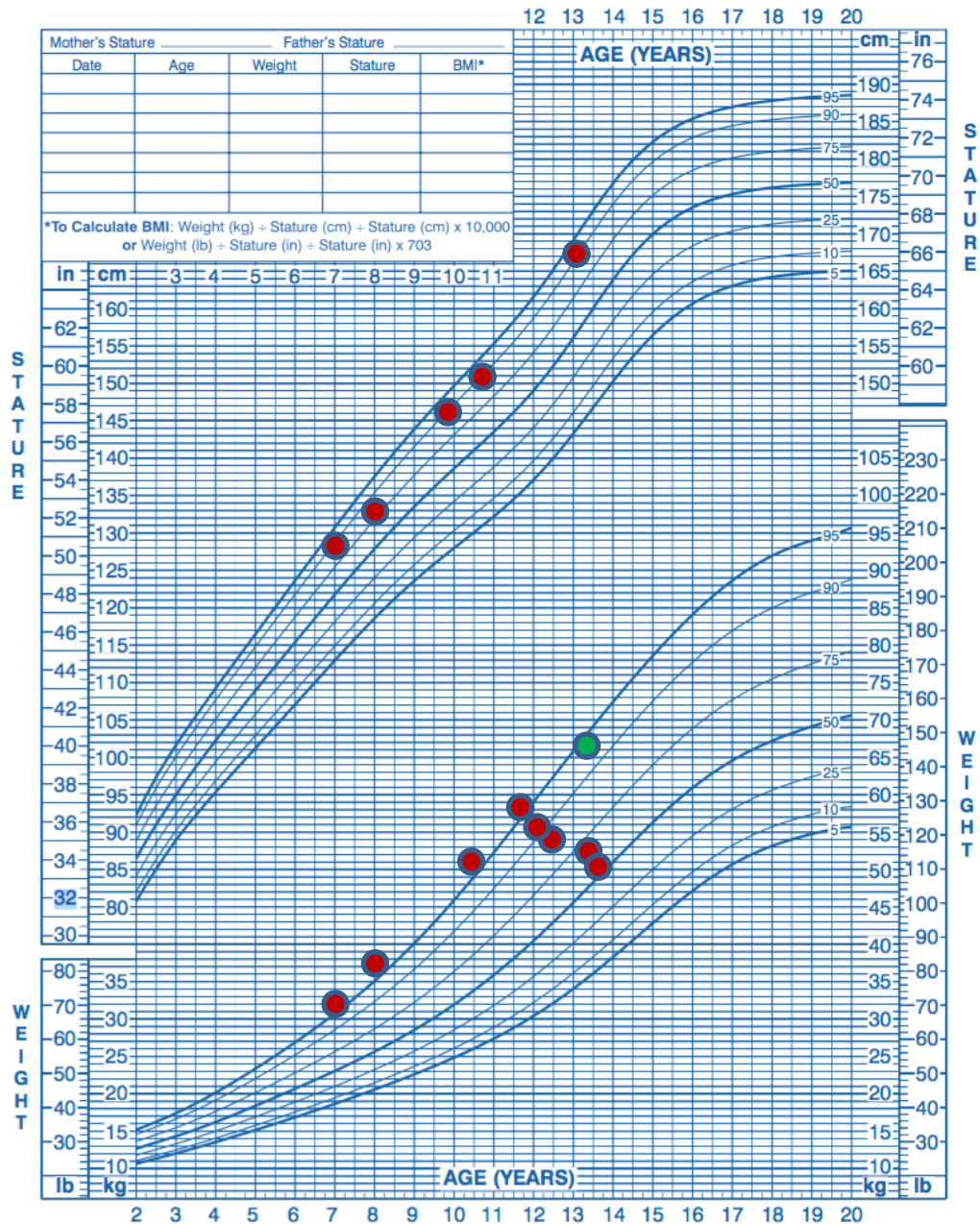


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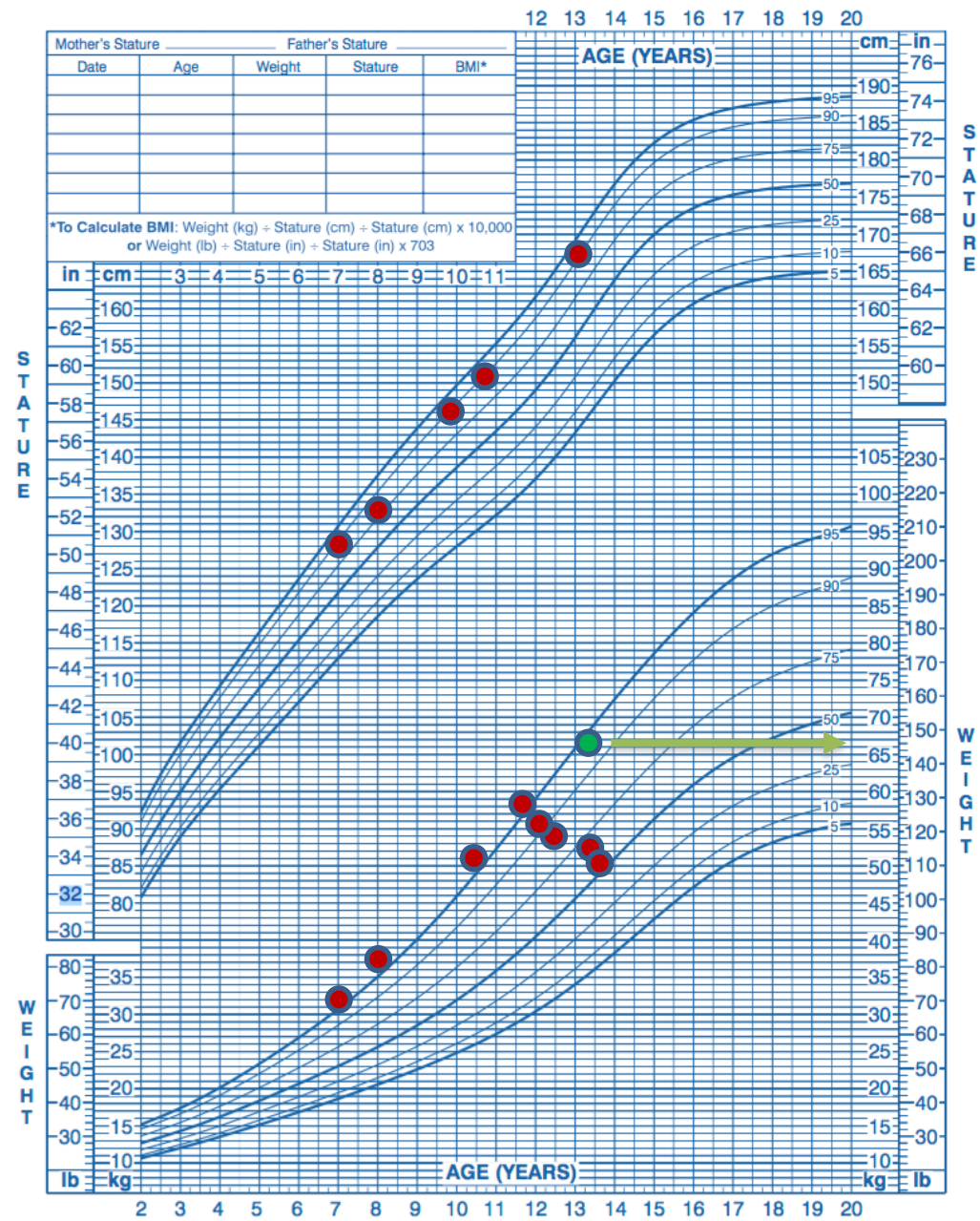
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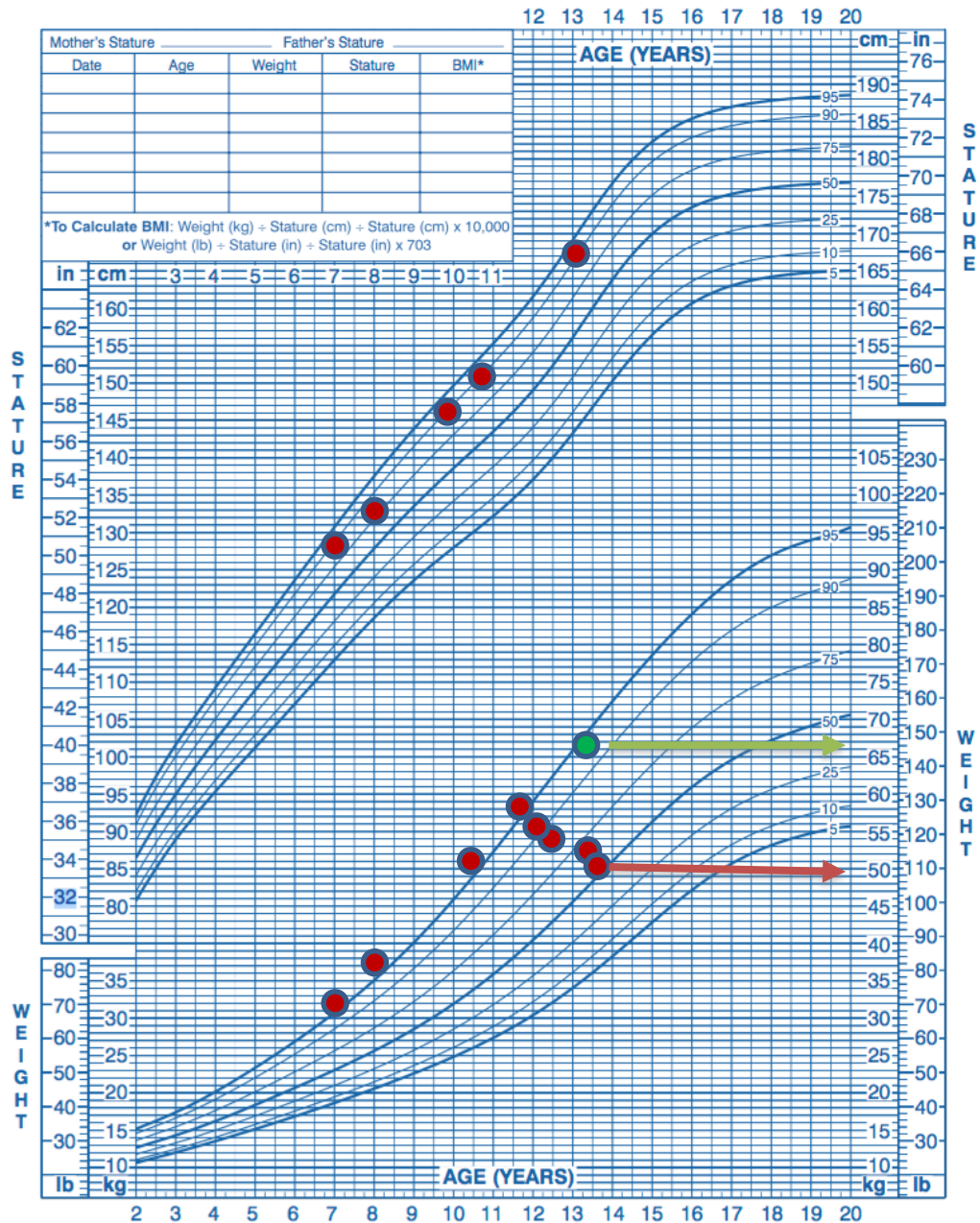
*Expected
Weight:
67kg*

2 to 20 years: Boys

Stature-for-age and Weight-for-age percentiles

NAME _____

RECORD # _____



*Expected
Weight:
67kg
Current
Weight:
51kg*

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 the National Center for Chronic Disease Prevention and Health Promotion (2000).
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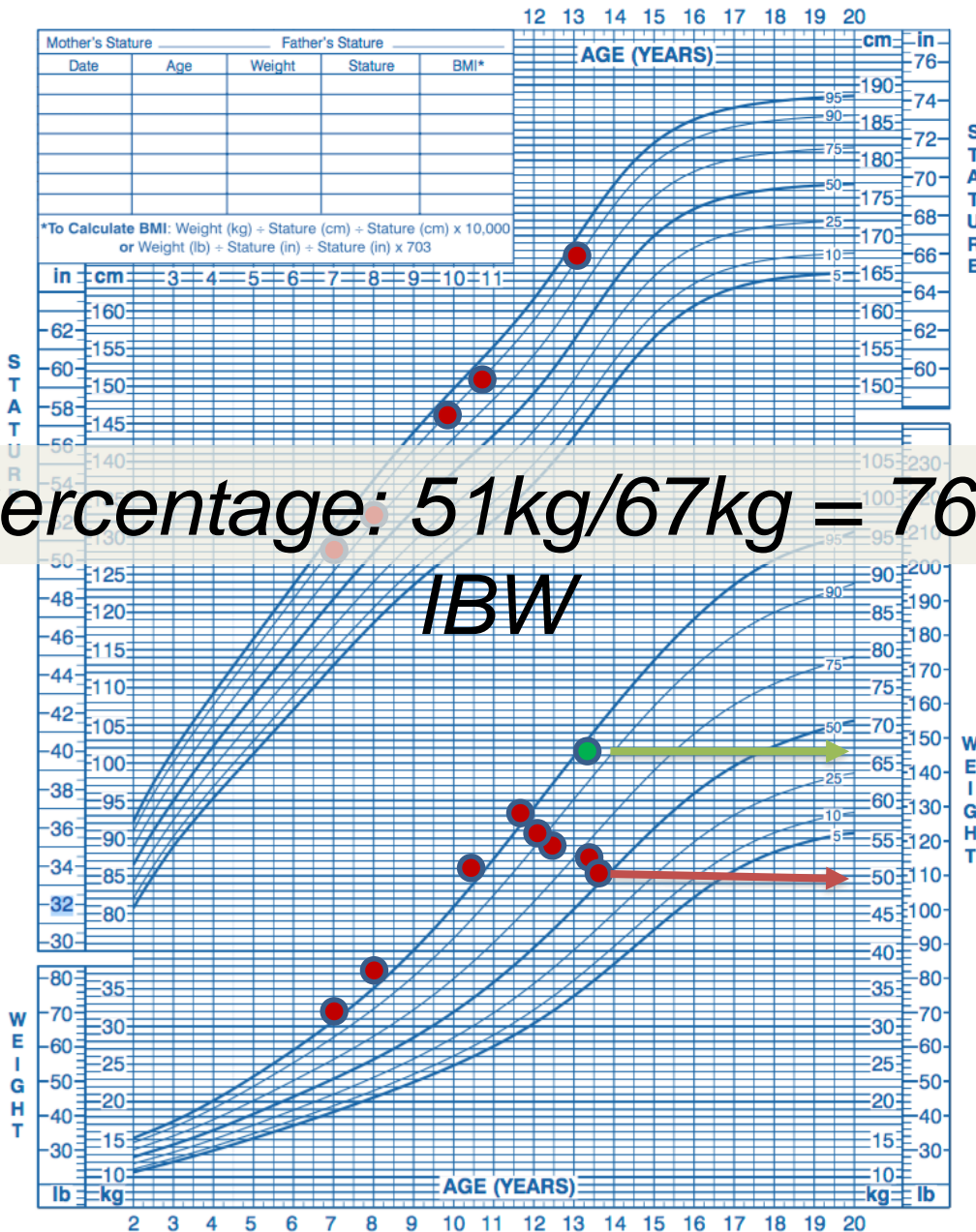


2 to 20 years: Boys

Stature-for-age and Weight-for-age percentiles

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Percentage: $51\text{kg}/67\text{kg} = 76\%$
IBW

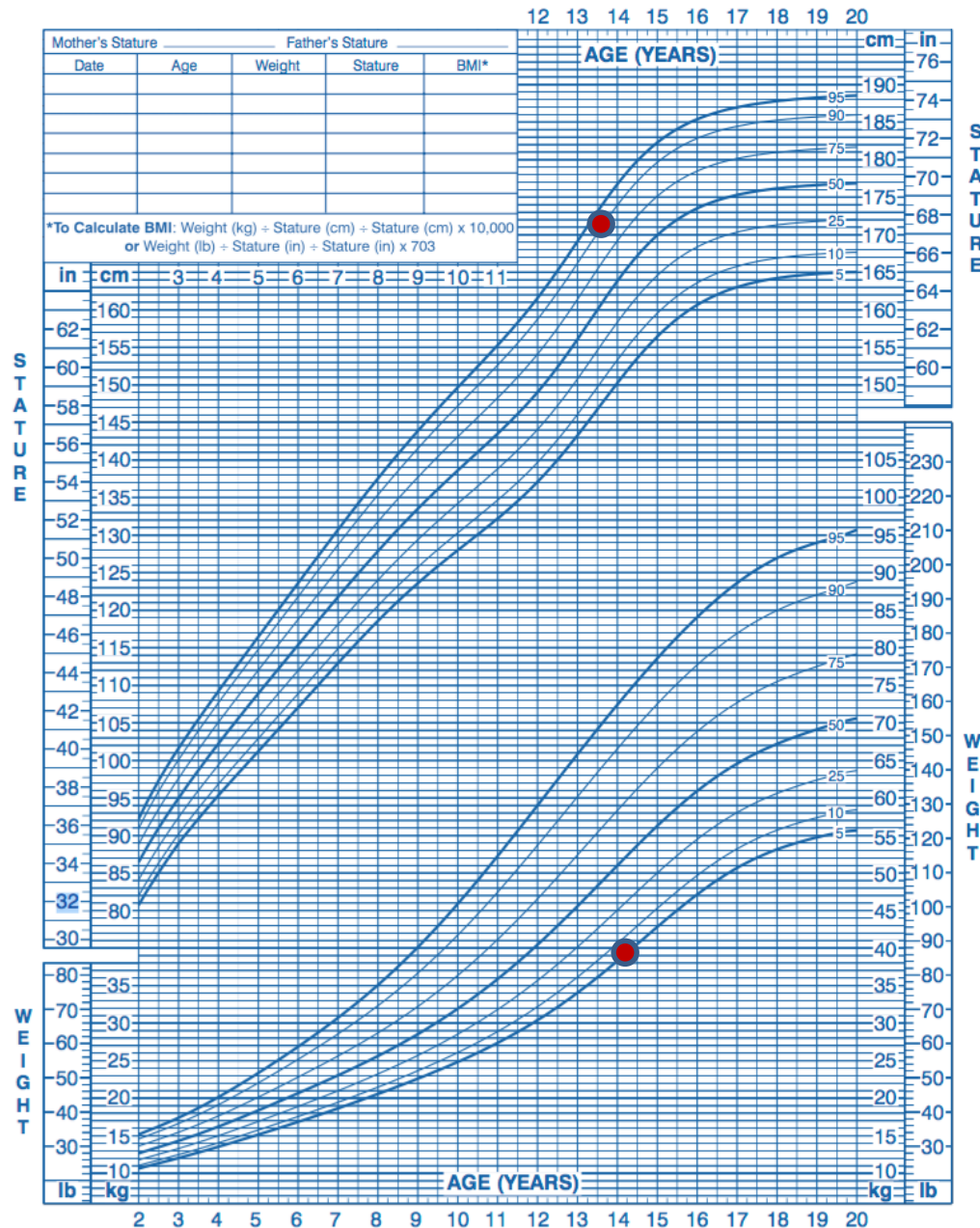
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67kg
Current Weight:
51kg

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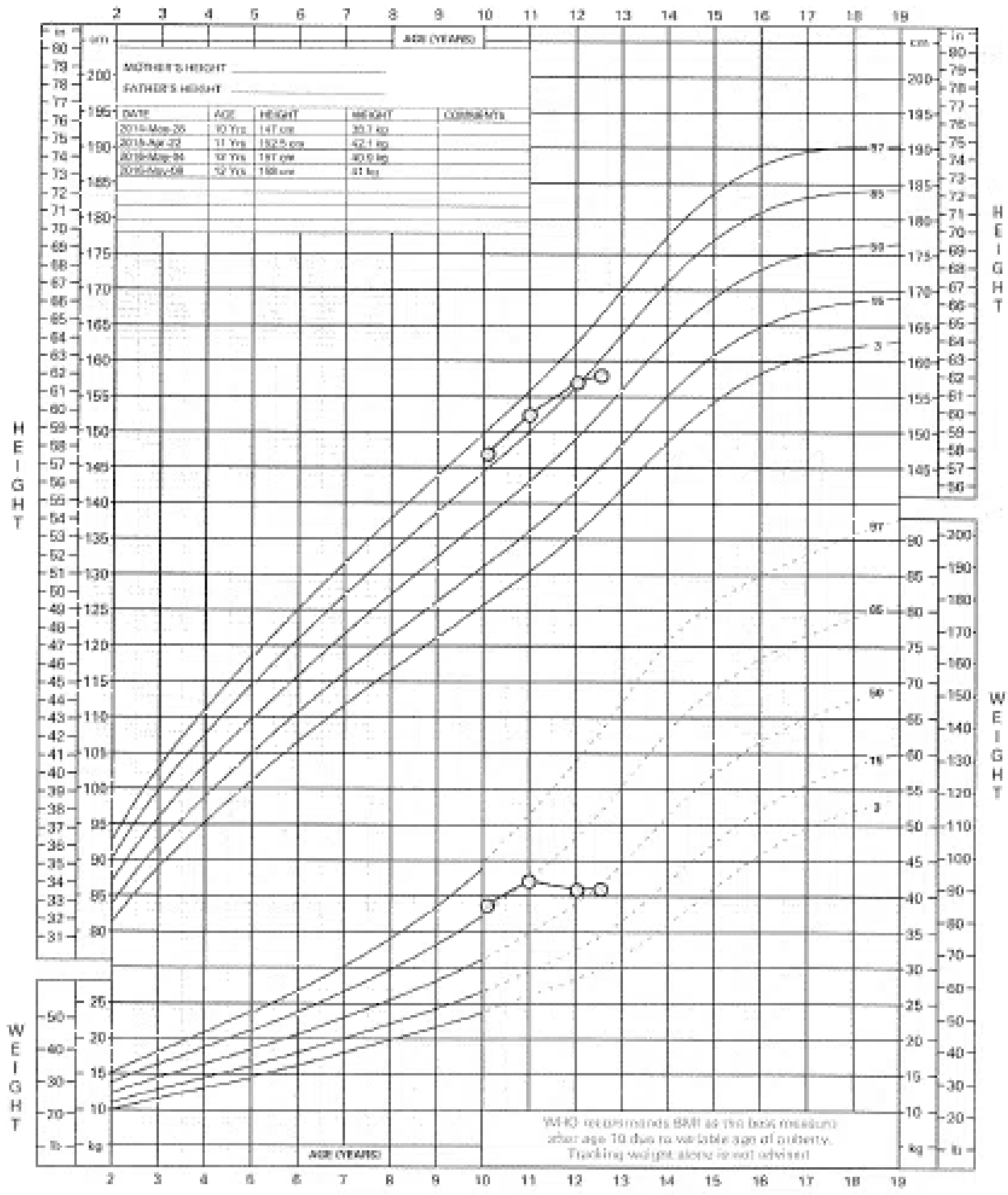


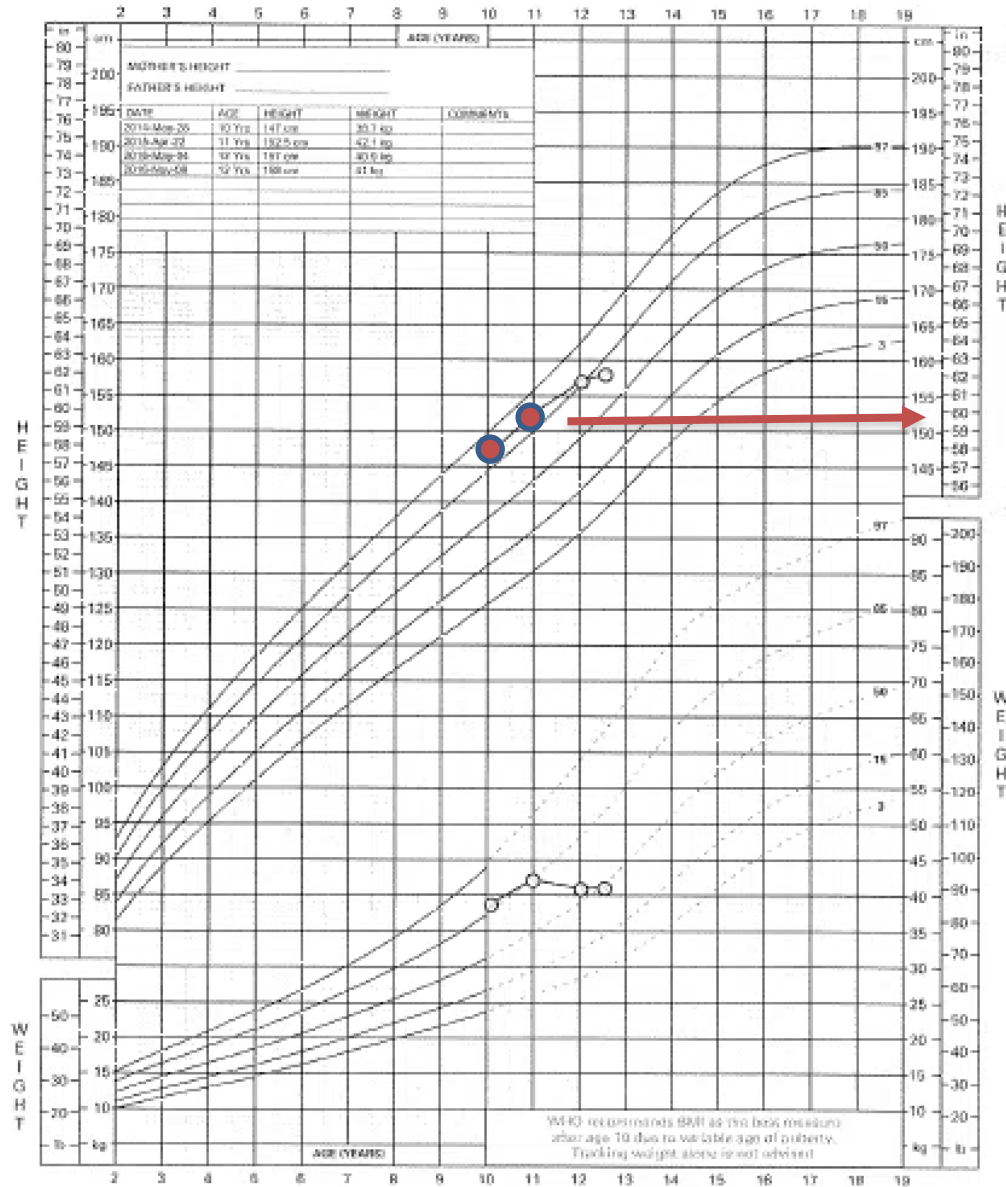
No growth chart

No previous growth points

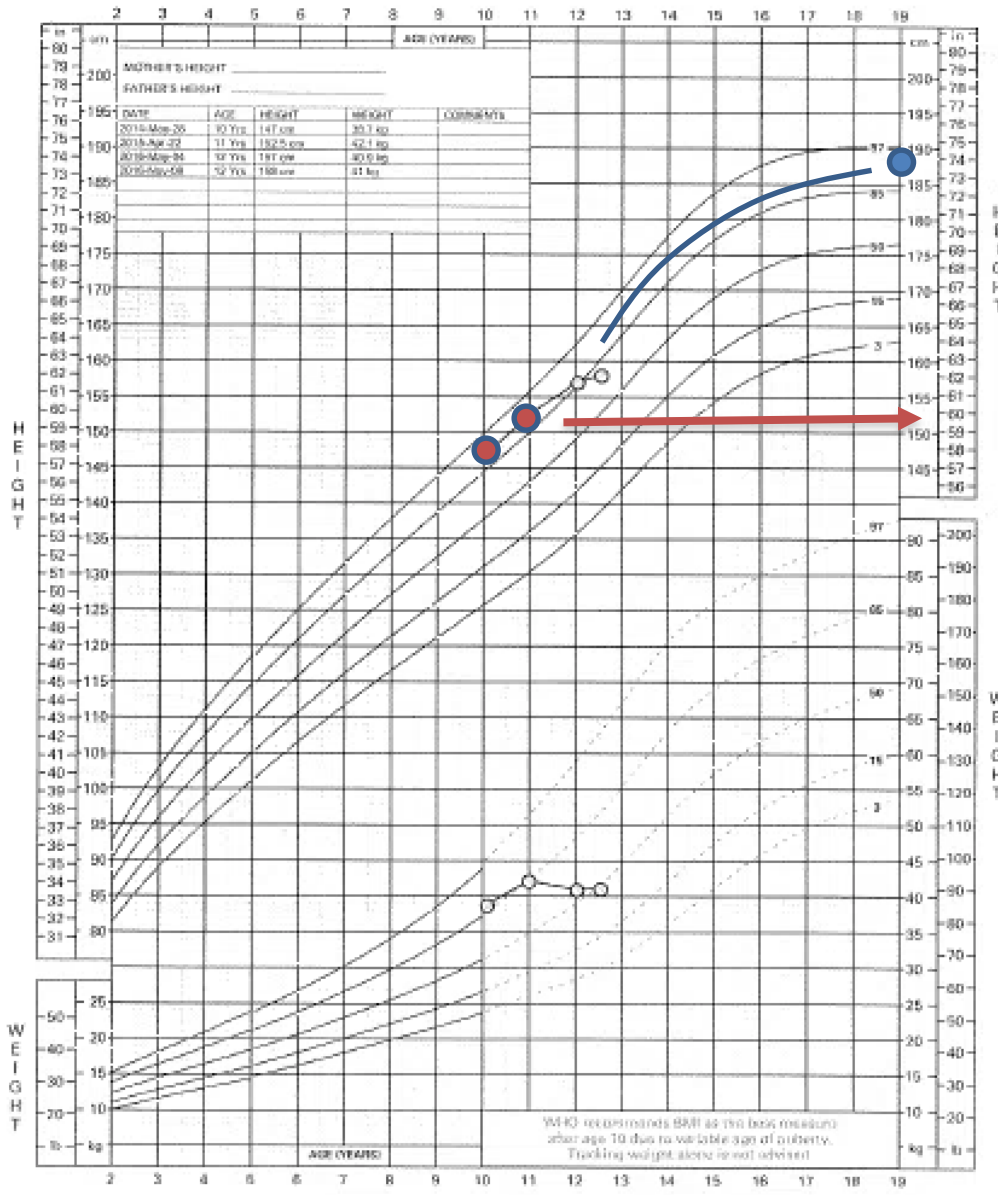
- Weight for height
- BMI 50% and calculate expected weight
- Weight at which lost period
- Get creative
 - Look at old pictures – proportional, stocky, lanky?
 - Look at family build

What weight do we want for a
teen to achieve ?



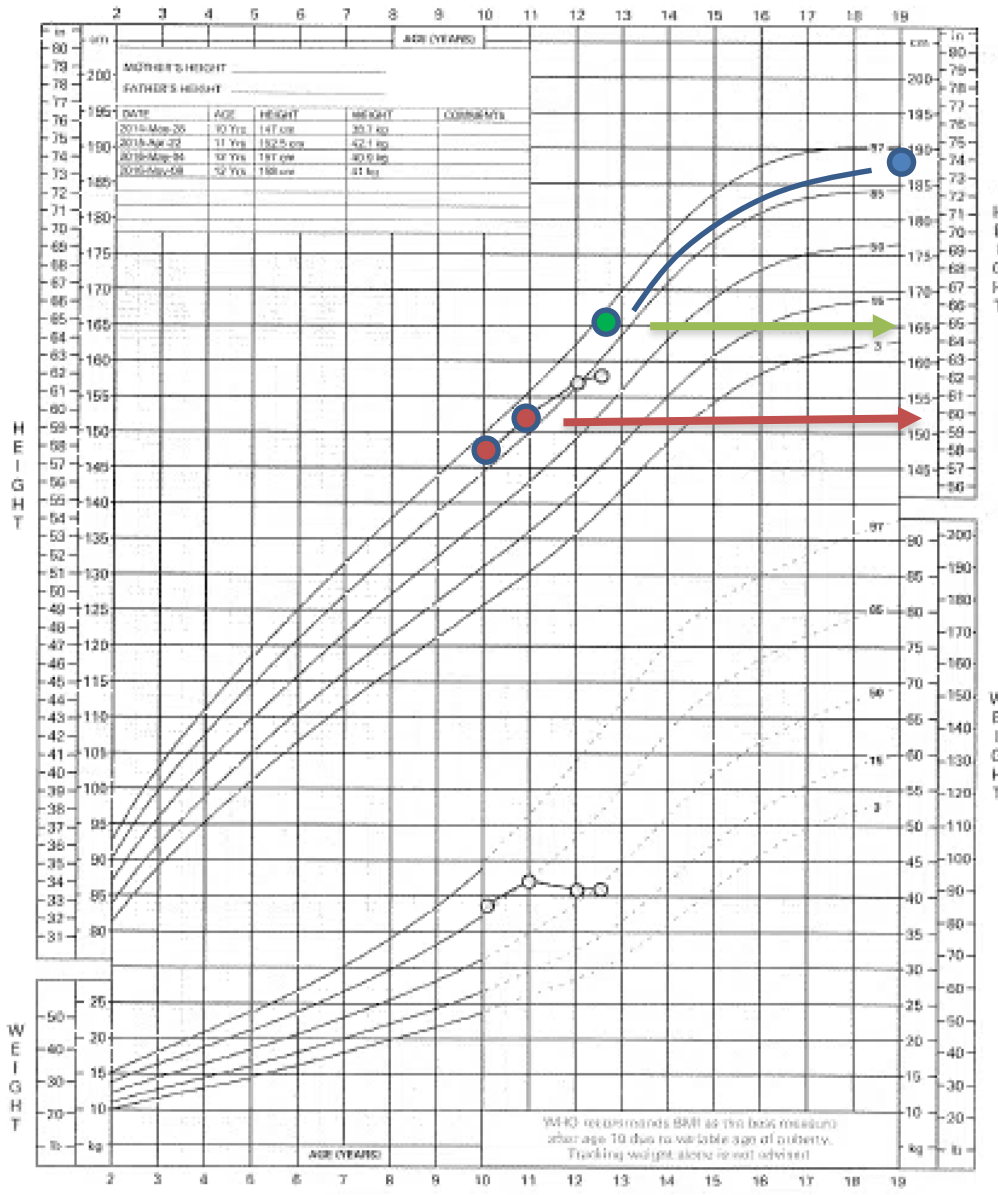


Previously tracking height = 85%



Brother's height = 85%

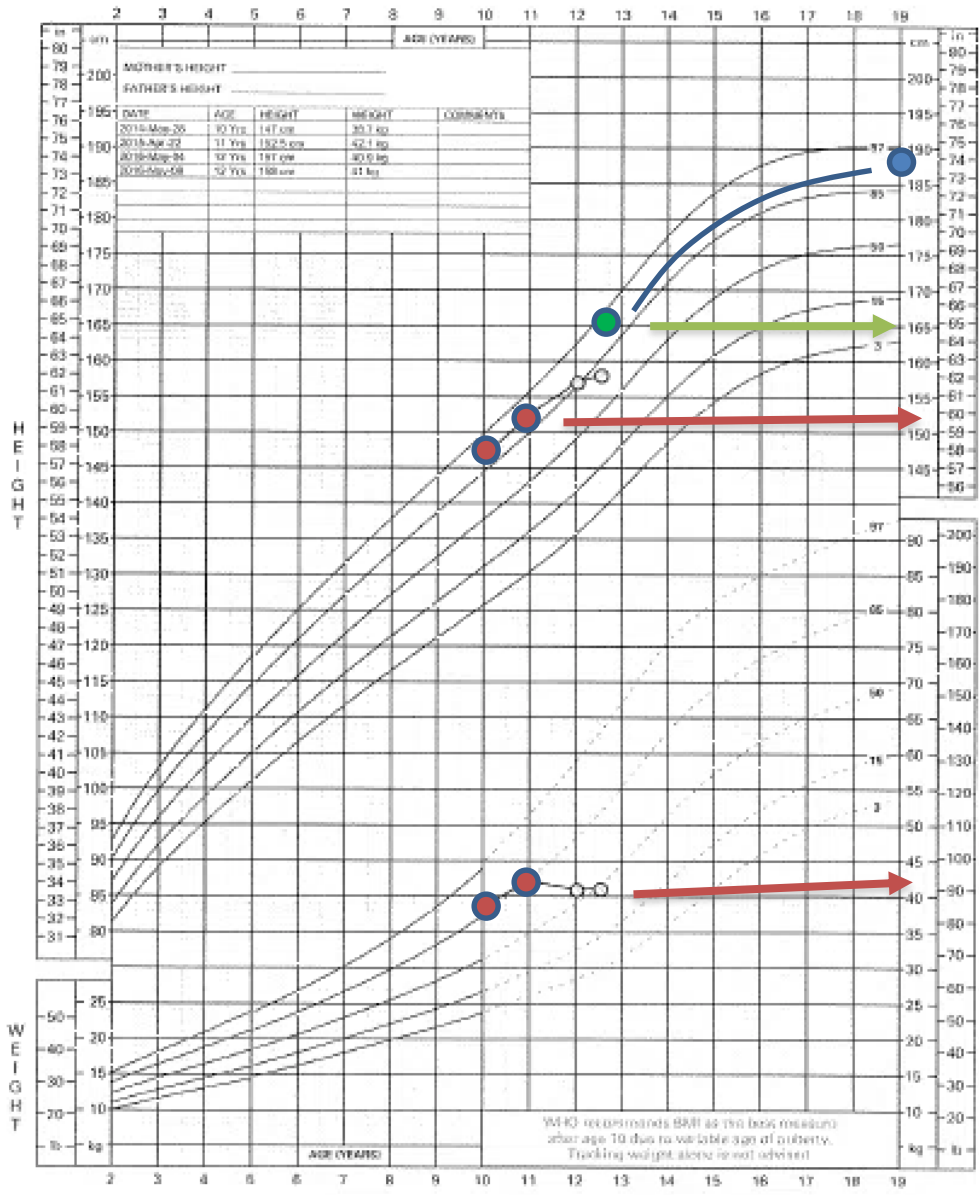
Previously tracking height = 85%



Brother's height = 85%

Expected height = 85%

Previously tracking height = 85%



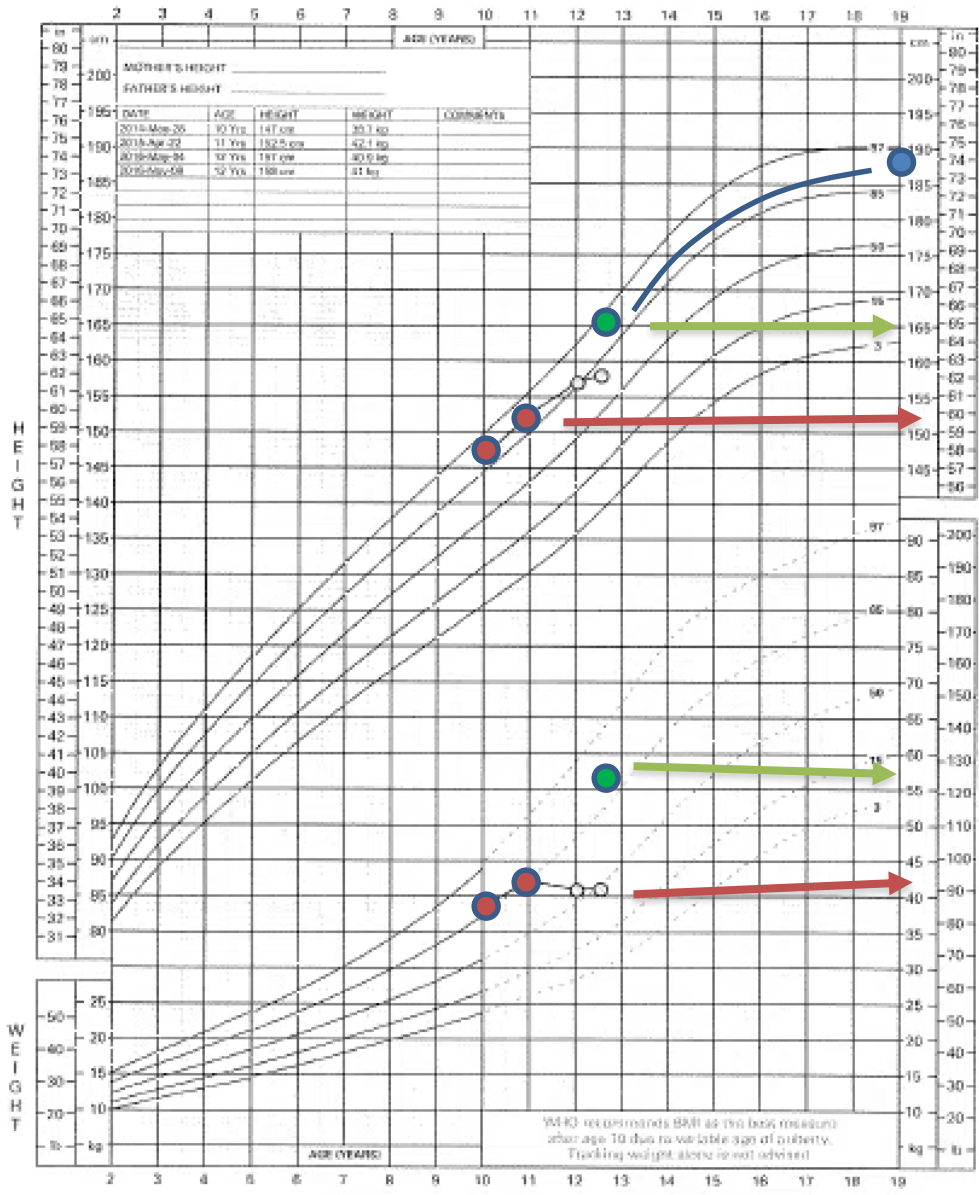
Brother's height
= 85%

Expected height
= 85%

Previously
tracking height =
85%

Previously
tracking weight
= 85%

WHO recommends BMI as the best measure after age 10 due to variable age of puberty. Tracking weight alone is not advised.



Brother's height = 85%

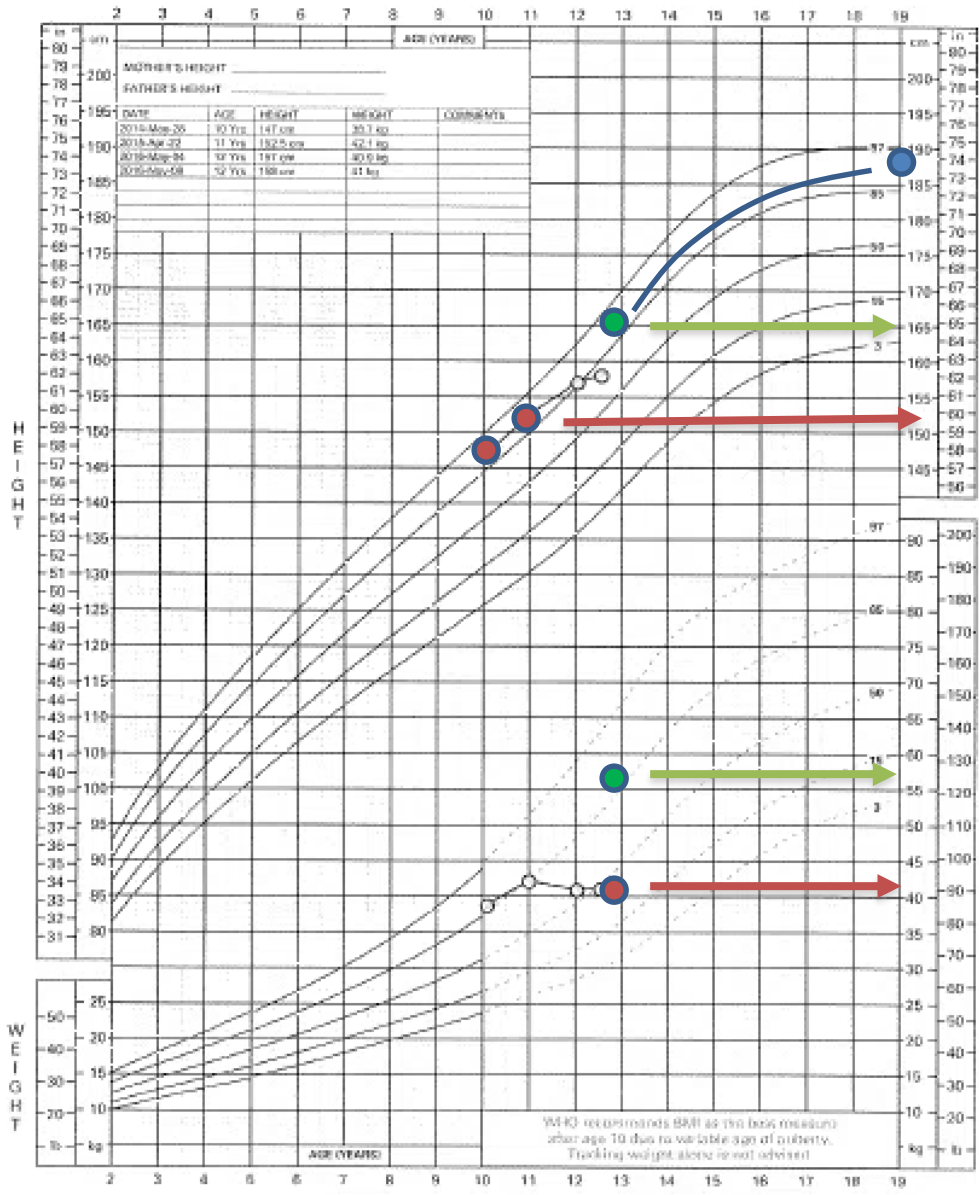
Expected height = 85%

Previously tracking height = 85%

Expected weight = 85% = 57 kg

Previously tracking weight = 85%

WHO recommends BMI as the best measure after age 10 due to variable age of puberty. Tracking weight alone is not advised.



Brother's height = 85%

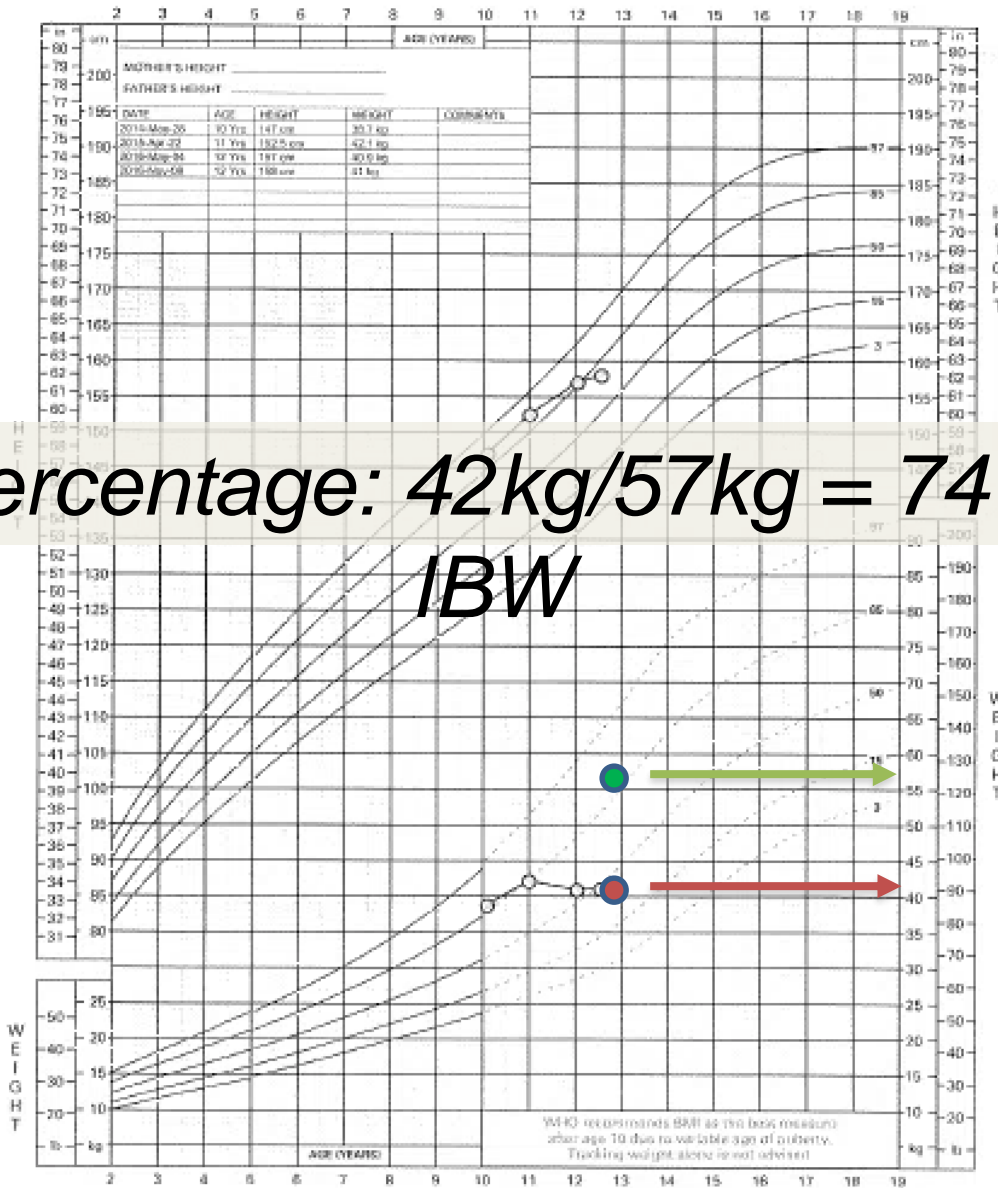
Expected height = 85%

Previously tracking height = 85%

Expected weight = 85% = 57 kg

Current weight = 42 kg

WHO recommends BMI as the best measure after age 10 due to variable age of puberty. Tracking weight alone is not advised.

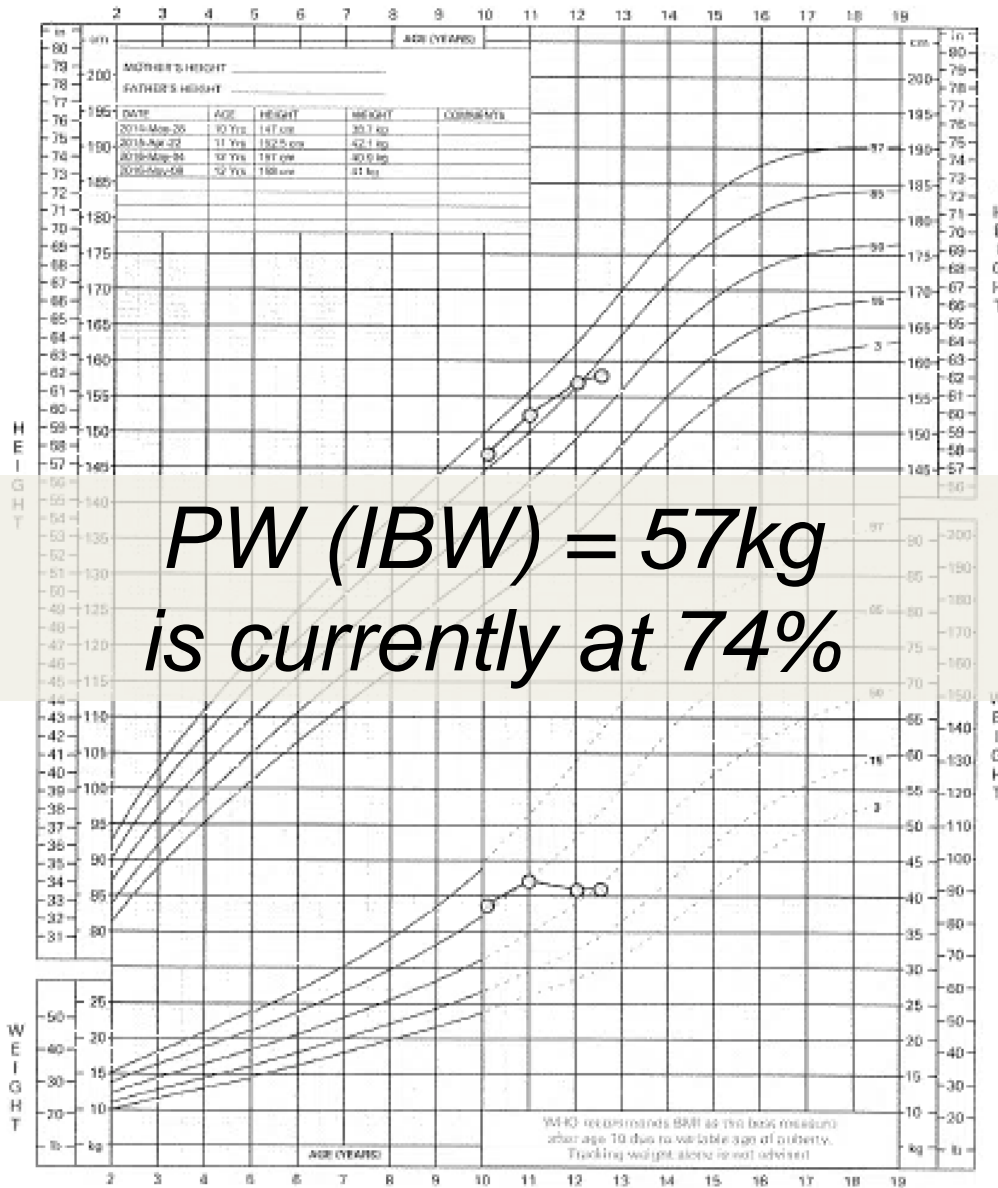


Percentage: $42\text{kg}/57\text{kg} = 74\%$
IBW

Expected weight
 = 85% = 57 kg

Current weight =
 42 kg

WHO recommends BMI as the best measure after age 10 due to variable age of puberty. Tracking weight alone is not advised.



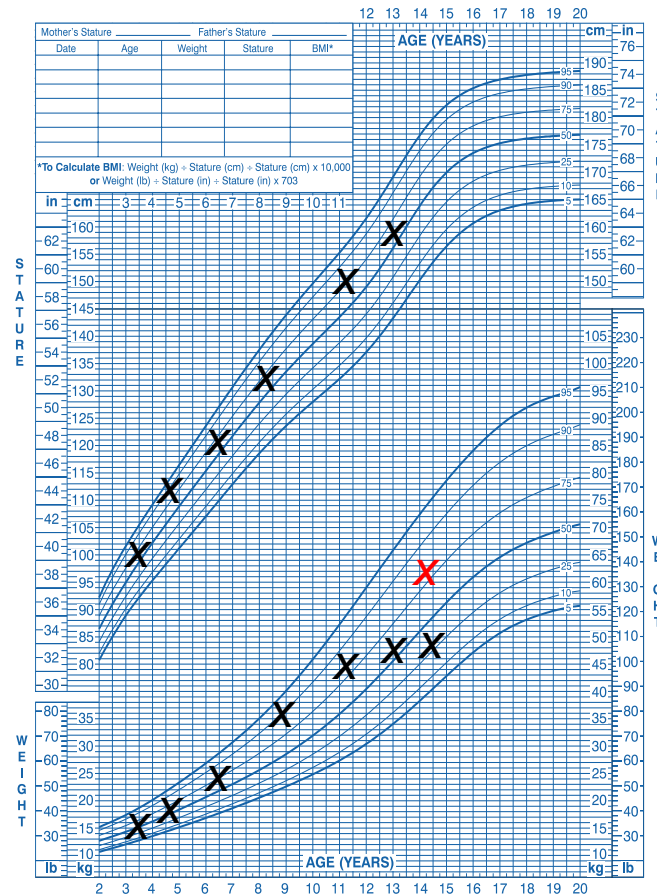
*PW (IBW) = 57kg
is currently at 74%*

Sam's Growth chart

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

NAME _____

RECORD # _____



Progress Weight: 63kg
Actual weight: 50.4kg

%PW = 80%

Published May 30, 2000 (modified 11/21/00).
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>



SAFER • HEALTHIER • PEOPLE

Sam comes back to your office two months later after fainting in class for the second time this week.



1. What is your approach to this development?
2. What would your assessment now include?



Results

Ht: 166 cm

Wt: 44.1 kg

BMI: 16.0

%PW: 70%



BP supine: 103/70 HR 45

BP standing: 90/61 HR 82

Oral temp: 36.2 C

Results of Investigations

Hemoglobin 129 (135-175)

MCV 75 (80-100)

WBC 3.9 (4.0-11.0)

Abs neutrophils 2.2 (2.0 – 7.5)

Platelets 140 (150-400)

Sodium 133 (135-145)

Potassium 3.0 (3.5 – 5.2)

Chloride 104 (98-108)

Creatinine 121 (67-117)

Urea 8.8 (2.7 – 8.4)

Glucose 3.8

ECG – sinus bradycardia 43 bpm

QTc 460

Calcium 2.39 (2.15-2.60)

Phosphate 1.19 (0.90 – 1.65)

Magnesium 0.86 (0.70 – 1.00)

Total protein 54 (60 – 80 g/L)

Albumin 30 (35-55 g/L)

AST 19 (< 35)

ALT 11 (< 50)

TSH 0.78 (0.47- 3.41)

ESR 2 (2-30)

Urine dip negative

Celiac screen historically negative



What is your next step?



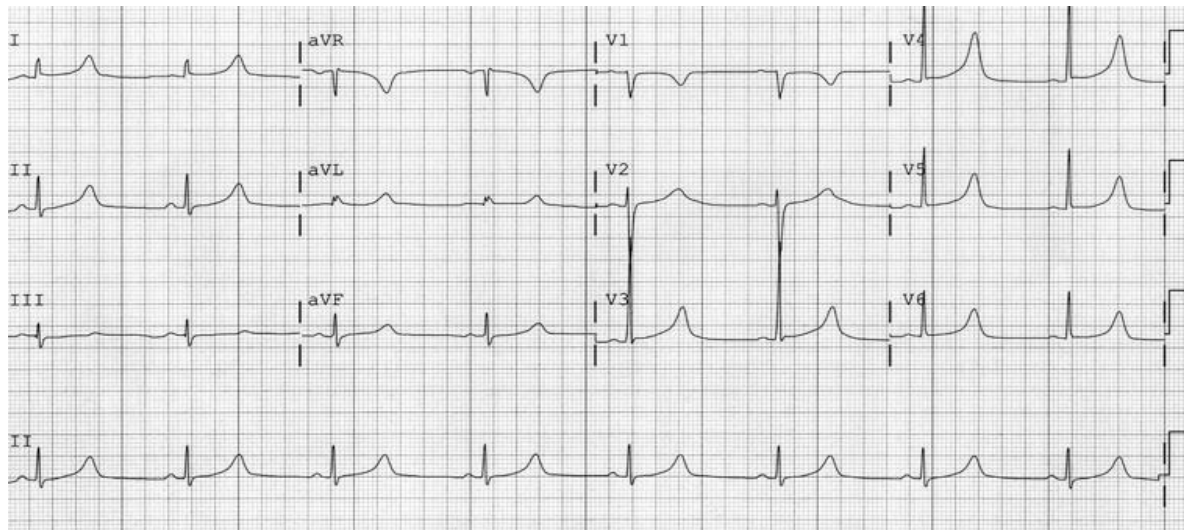
Criteria for hospitalization

- Acute medical stabilization
- $< 75\%$ BMI for age, sex, and Ht (or $< 75\%$ PW)
- Hypoglycemia < 2.5 mmol/L
- Electrolyte disturbance
 - Hypokalemia
 - Hyponatremia
 - Hypophosphatemia/Hypomagnesemia
 - Metabolic acidosis/alkalosis



ECG abnormalities

- Prolonged QTc > 450
- Bradycardia < 45
- Other arrhythmias (other than sinus bradycardia)



Hemodynamic instability

- Bradycardia < 45 bpm
- Hypotension $< 80/50$ mmHg
 - If HR < 50 or sBP < 90 – repeat manually
- Hypothermia (core body temp < 35.6 C)
- Orthostatic changes
 - BP and HR supine and standing
 - Increase in HR > 30 bpm
 - Decrease in BP > 20 mmHg (systolic) or 10mmHg (diastolic)



Acute medical complications of malnutrition

- Syncope
- Seizures
- Cardiac failure
- Liver failure
- Renal failure/severe dehydration
- Pancreatitis



Other

- Refeeding syndrome
 - Marked edema
 - Hypophosphatemia
- Severe depression
- Pregnancy
- Poor response to outpatient treatment
 - Unreliable follow-up



Results

Ht: 166 cm

Wt: 44.1 kg

BMI: 16.0

%PW: 70%



BP supine: **103/70** HR **45**

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ESR 2 (2-30)

Urine dip negative

Celiac screen historically negative

ECG – sinus bradycardia **43 bpm**

QTc 460



Goals of admission

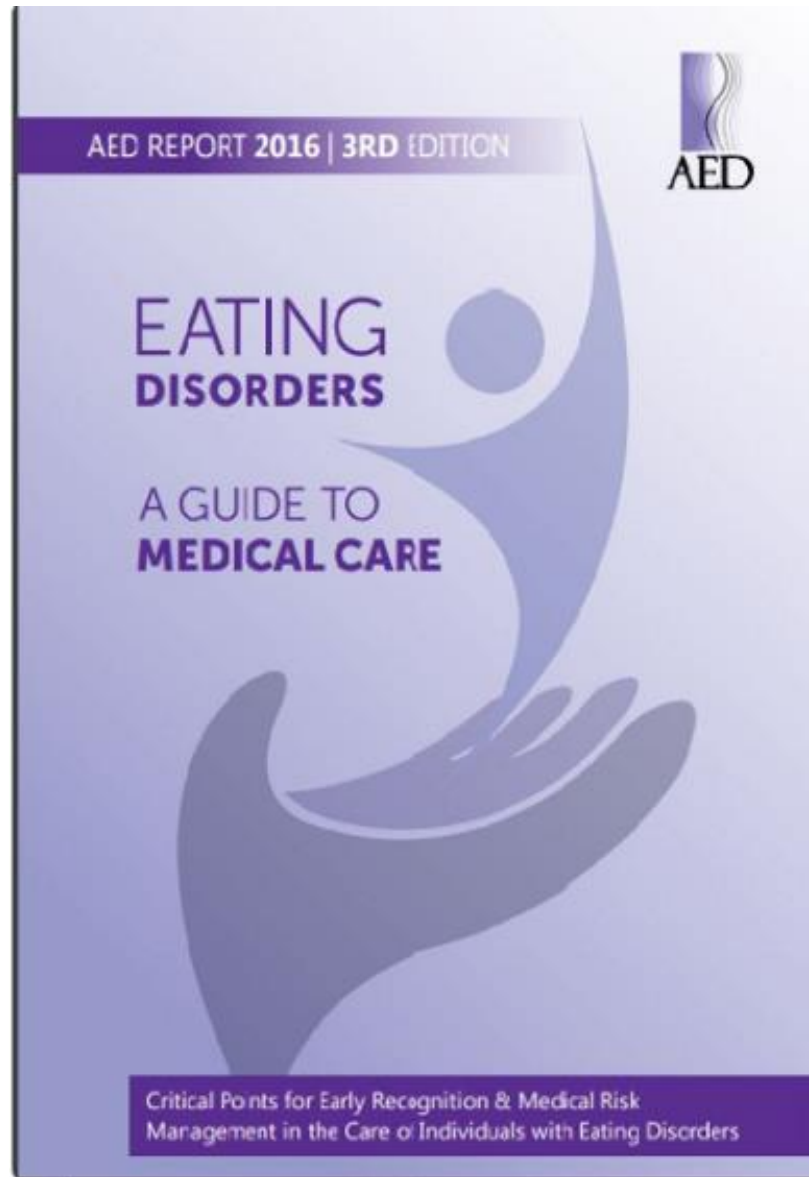
- Safely refeed the patient
- Avoid re-feeding syndrome caused by too rapid feeding
- Avoid underfeeding by too cautious rates of feeding
- Manage behavioural problems (multidisciplinary)
- Manage family concerns
- Arrange appropriate discharge/transfer plan for patient



- Restore medical stability
- Achieve safer BMI
- Stabilize body weight
- Reduce acute purging or other eating disorder behaviours
- Develop appropriate eating behaviour for medical stability in community



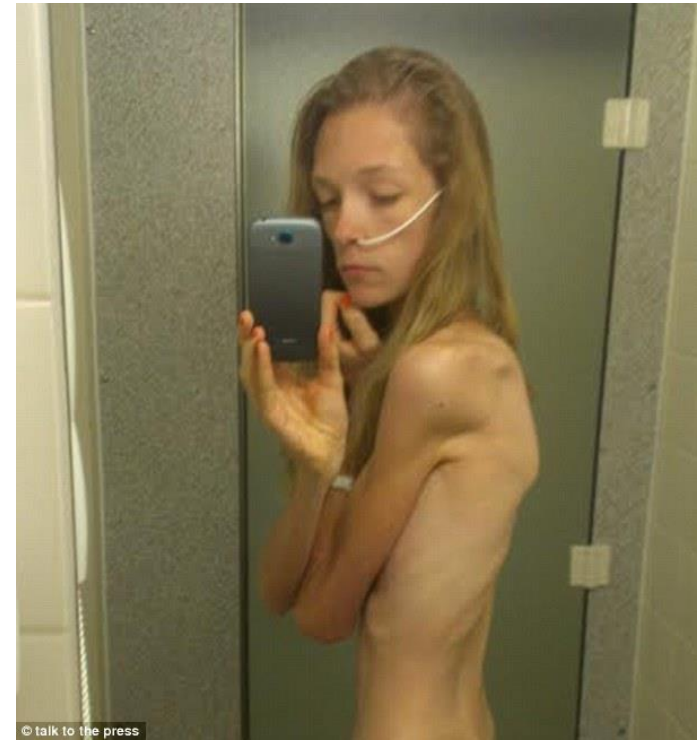
AED Eating Disorders A Guide to Medical Care



Prognosis: met analysis

- Mortality: **SMR 12**
- Recovery: 46.9%
- Improvement: 33.5%
- Continuing problem: 20.8%

- Hannah Koestler. London

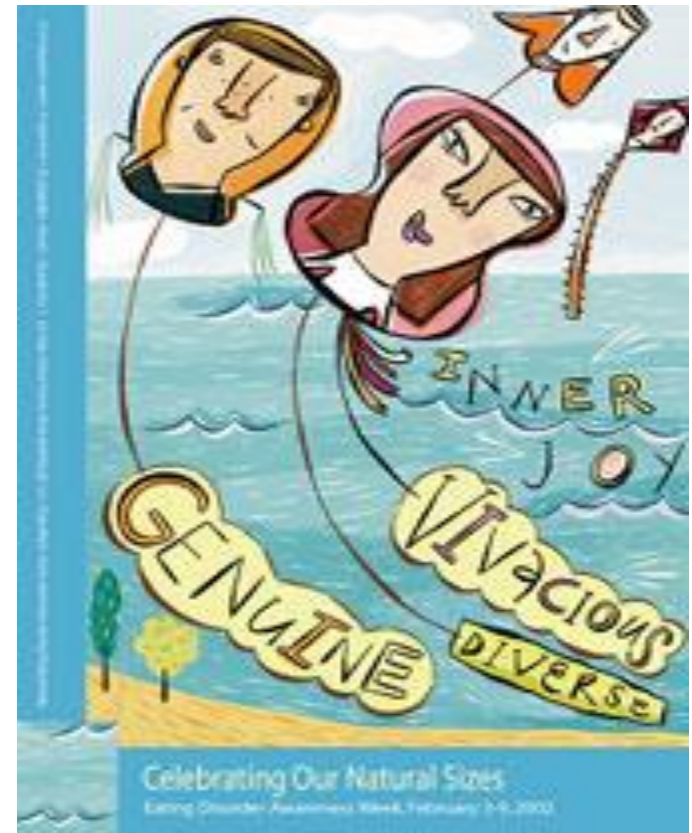


NEDIC www.nedic.ca

- **National Eating Disorder Information Centre**

**University Health Network
Toronto, Canada.**

- **Toll Free 1-866-633-4220**
- **Toronto 416-340-4156**





Sheena's Place

Support for eating disorders

- 87 Spadina Road,
Toronto M5R 2T1
- Spadina subway station
- Tel (416) 927 8900
- Fax (416) 927 8844
- www.sheenasplace.org



FEAST

- Families Empowered And Supporting Treatment of Eating Disorders
- An international organization of and for caregivers to reduce the suffering caused by eating disorders
- Promote research education and evidence based treatment
- www.feast-ed.org

CMHA

- CMHA Eating Disorders
 - <https://cmha.ca/mental-health/understanding-mental-illness/eating-disorders/>



**Canadian Mental
Health Association**
Calgary
Mental health for all

Learning Objectives

At the end of this presentation you should be able to

- Describe the features of eating disorders presenting in adolescence in the context of set point theory
- Develop a therapeutic approach to managing eating disorders in family practice settings
- Recognize the red flags that may require hospitalization or specialist intervention

THE FINAL WORD

I don't like your fashion business mister
And I don't like these drugs that keep you thin
I don't like what happened to my sister
First we take Manhattan, then we take Berlin



ANY QUESTIONS?