How to improve the long-term outcomes of Failure To thrive in the pediatric Patient

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Learning Objectives

Upon conclusion of the seminar, the learner will be able to:

- Describe diagnosis criteria for Failure-to-Thrive in the pediatric patient
- Confidently assess a pediatric patient for Failure-to-Thrive
- Discuss catch-up growth in a pediatric patient diagnosed with Failure-to-Thrive
- Implement nutrition interventions that will improve the outcome of Failure-to-Thrive in the pediatric patient
- Confidently measure and evaluate the long-term goals of a pediatric patient who has been diagnosed with Failure-to-Thrive

Background

- Failure to thrive is a diagnosis that has been used for many decades
- There is an inconsistent definition of Failure-to-Thrive in the medical field
  - Undernutrition, malnutrition, weight faltering, and faltered growth
  - Weight below 5th percentile, Weigh-for-length below 5th percentile; BMI for age below 5th percentile
  - Decrease in growth velocity by two major percentiles
- Poor weight gain due to the inability to sufficiently use nutrition
  - There is are multiple psychosocial stressors and medical conditions that could be contributing to the condition

Homan, GJ. Failure to thrive: A practical guide. *Am Fam Physical*. 2016; 94(4):295-299
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American Academy of Pediatrics Definition:

"An abnormal pattern of weight gain defined by the lack of sufficient usable nutrition and documented by inadequate weight gain over time"

–American Academy of Pediatrics

HOMAN, GJ. FAILURE TO THRIVE: A PRACTICAL GUIDE. AM FAM PHYSICAL. 2016; 94(4):295-299.

Why is Nutrition so Important in the Pediatric Setting?

- In the pediatric patient adequate nutrition is directly related to growth and development
- Delays in growth are associated with developmental delays and behavior risks
- Weight loss is the first altered growth pattern
  - Inadequate growth velocity of length is typically seen next
  - Inadequate FOC measurements are typically seen last

Motil, KJ & Duryea TK. Poor weight gain in children younger than two years in resource-rick countries: Etiology and evaluation. Retrieved from UpToDate Website: ttps://www.uptodate.com/contents/poor-weight-gain-in-children-younger-than-two-years-in-resource-rich-countries-etiology-and-evaluation#H1. Accessed Feb 22, 2020

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Considerations

- FTT is categorized as organic vs inorganic
  - A majority of FTT cases are inorganic
  - Most often related to inadequate calorie intake
  - Organic cases will typically have additional medical symptoms that will need to be addressed by the pediatrician and/or specialist
    - Need nutrition intervention related to special diet or increased needs

      Examples: Congenital Heart Disease, Cystic Fibrosis, Celiac Disease
- Is often multifactorial

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Failure to Thrive Can lead to malnutrition

- PERMANENT SHORT STATURE
- IMMUNE DEFICIENCY
- PERMANENT NEUROLOGICAL DAMAGE TO BRAIN AND CENTRAL NERVOUS SYSTEM
- LONG-TERM DEVELOPMENTAL DEFICIENT

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Review Medical History

- Birth history
  - History of prematurity
  - History of IUGR (Intrauterine growth restriction)
  - History of Low birth weight
- Neurological conditions
- Respiratory conditions
- Underlying or suspected conditions
- Currently seen by or referred to other specialists (GI, Speech therapy)

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Determine Energy Needs & Growth Parameters

- Calculate the patient's average weight change from referral
  - Has there been weight gain/loss
  - Are they meeting recommended growth parameters
  - How are they plotting on the growth chart
- What are the typical energy needs for a patient of their age
  - In pediatric population energy and protein needs are based on kcal/kg/d
- Catch up energy needs
  - Kcal/kg/d = IBW (kg) x kcal/kg/d (DRI for age)/actual wt (kg)

Pediatric Nutrition Reference Guide, 12th ed. Houston, TX: Texas Children's Hospital. 2019.

Nutrition Focused Interview

- Interviewing the parent
  - Nutrition assessments can be a sensitive topic in FTT cases
  - Don't be afraid to get clarification, rephrase questions
    - May ask the same question multiple times
    - Do they eat regular meals and snacks
      - Do they go to daycare/school
        - Do they receive breakfast and/or lunch and snacks
    - How much milk do they drink
    - How much juice do they drink
  - Does the parent have a food log or can they provide a 24-hour recall
  - Are there concerns about food accessibility
    - Do they receive SNAP, WIC
    - Do they need assistance with any forms

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Assessing Intake for Infants

- Who typically mixes the formula?
- How are you mixing the formula?

  *When able, have the parent demonstrate
- Is the parent following the mixing directions on the can
  - Water or formula first
  - How many scoops of formula
  - Are they using the appropriate measuring tool
  - How is formula scooped
    - Level, unpacked scoops
  - Is the parent adding anything else to the bottle
    - Rice
    - Baby food
    - Tea (Herbal remedies)
    - Vitamins

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Assessing Intake for Infants

- Formula intake if appropriate
  - How often are they eating
  - How much are you offering
  - Are they finishing the full amount that you offer?
  - Is the child baby taking longer then 30 min to finish the bottle
  - Do they act hungry shortly after they feed

Date Time	Amount offered	Amount finished	Duration of feed
Example: 1/2/2020 6 am	120 ml	90 ml	15 min
1/2/2020 9:30 am	120 ml	30 ml	10 min
10:00	90 ml	90 ml	30 mln

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Assessing Intake for Toddler and Older Children

- Collect 3-day food log (or 24 hour recall if necessary)
  - Determine what is a typical day
  - Food quality
  - Frequency of meals/snacks
  - Beverage intake
- Discuss behaviors at mealtimes
- Evaluate parental ideas about nutrition
- Determine of there are any cultural beliefs towards food or growth that could impact the child's nutrition

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Meal Time Behaviors

- Ask about meal times
- Does the family sit down and eat as a family
  - Who prepares meals
  - How is the meal prepared
  - How do portions sizes look
  - How frequently do they eat out
  - What is the behavior pattern at meal time
  - Perceived as acting out
  - Distractions (technology, siblings)
- Does the child "graze" all day

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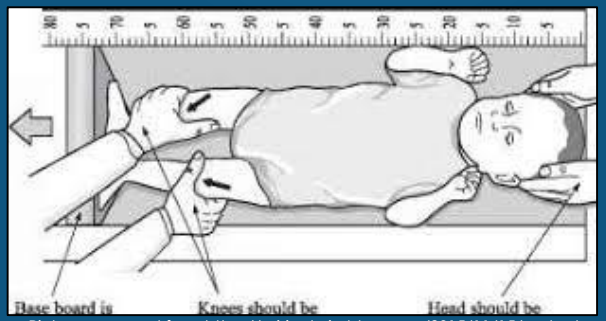
Weights & Measurements

- Your first appointment is going to be a baseline
- Make sure the person taking the weight is properly trained to do so and has correct tools
- Annotate how the patient is being weighed and/or measured
  - Type of scale
    - Ideally the same scale should be used for each appointment
    - Scale should be calibrated
  - Clothing (no shoes or jackets)
- Diaper should be clean and dry
- Determine patients' growth parameters from last available weight

Picture accessed from https://www.google.com/search?q=infant+scale&client=firefox-b-1-d&source=lnms&tbm=isch&sa=X&ved=2ahUKEwil-LTFtNHnAhWEB80KHUk8BQcQ_AUoAnoECBAQBA&biw=1231&bih=965#imgrc=arkbAQhDvejFEM&imgdii=ib6HQp2f-ctrqM February 14, 2020



Picture accessed from https://raisingtwinsblog.com/2015/11/15/understanding-and-plotting-growth-charts-of-newborns-and-children/ February 14, 2020

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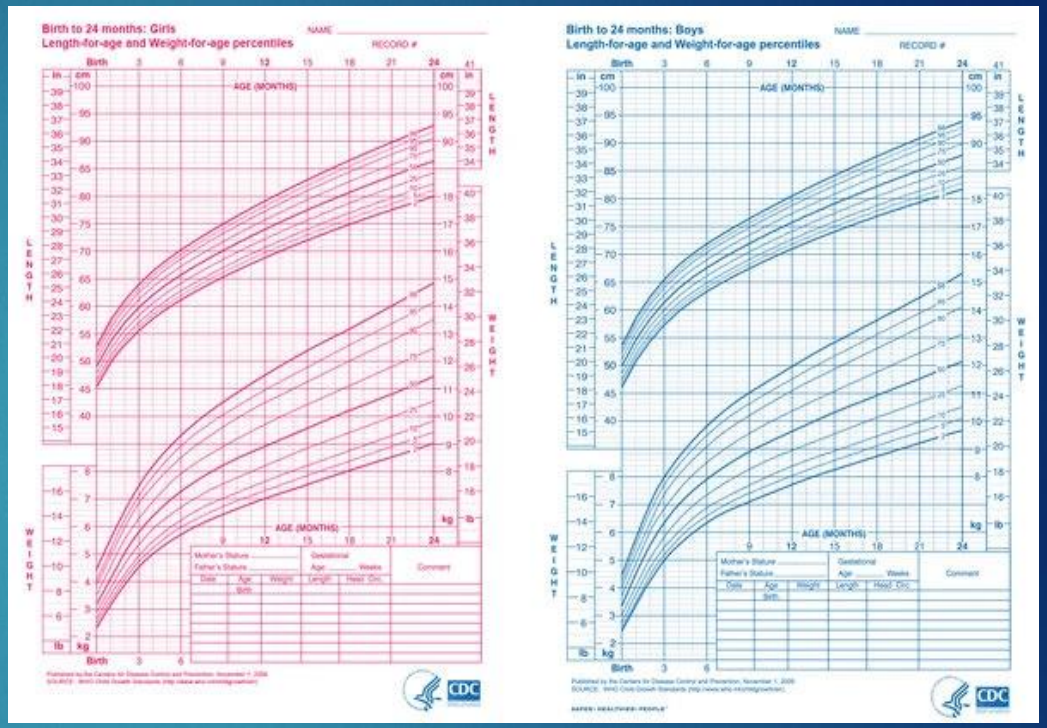
Growth Chart

- Plot measurements on correct growth chart
  - WHO growth chart 0-2 years of age
  - CDC growth chart for 2 years and older
- Use specialty growth charts
  - Cerebral Palsy
  - Trisomy 21
  - Turner Syndrome
  - Fenton for premature infants (<50 weeks)
  - Low Birth weight



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Growth Chart Considerations

- Patient should follow their own growth curve
- The 50th percentile may not be an appropriate goal for the patient's weight
- is the average when considering the entire population
- Consider weight-to-length or weight-to-height

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Recommended growth

Age	Weight (grams/day)	Height (cm/week)	FOC (cm/week)
0-4 months	23-34	0.8-0.93	0.38-0.48
4-8 months	10-16	0.37-0.47	0.16-0.2
8-12 months	6-11	0.28-0.37	0.08-0.11
12-16 months	5-9	0.24-0.33	0.04-0.08
16-24 months	4-9	0.21-0.29	0.03-0.06
20-24 months	4-9	0.19-0.26	0.02-0.04
2-6 years	Growth patterns vary in children ages 2 to puberty; average weight gain is 2-3 kg (4.6-6.5 lbs) per/year; avg height 5-8 cm (25-3.5 in) per/year		
6-10 years			

Picture accessed from https://www.child-development-guidance.com/images/stages.jpg Feb 21, 2020

Pediatric Nutrition Reference Guide, 12th ed. Houston, TX: Texas Children's Hospital. 2019.

Nutrition Diagnosis

- Develop a PES statement based on determining cause of Failure to Thrive
- Inadequate energy intake
- Inadequate oral intake
- Limited food acceptance
- Feeding difficulty
- Increased nutrient needs
- Inadequate nutrient absorption

Inadequate caloric intake	Inadequate nutrient absorption	Increased metabolism

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Etiology

- Behavioral
  - Avoidance of eating
  - Refusal of certain foods
- Social
  - Limited food resources
  - Neglect/Abuse
  - Caregiver depression
  - Improper formula preparation
  - Harmful beliefs/misconceptions about child feeding
    - Parental avoidance of high-calorie foods
    - Excessive juice intake

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Interventions

IDEALLY NUTRITION EDUCATION SHOULD BE PROVIDED AT THE FIRST VISIT

Baylis, et Al (2018). A quality improvement initiative to improve feeding and growth of infants with cleft lip and/or palate. *Cleft Palate Craniofac J*. 2018; 55(9):1218-1224

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Team collaboration

- The preferred treatment method includes a multidisciplinary team1,2
  - Pediatrician
  - Dietitian
  - Nursing team
  - Social work
  - Speech Language Therapist
  - Occupational Therapist

Photo accessed from https://www.aarc.org/careers/career-advice/professional-development/multidisciplinary-team/ February 14, 2020

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Nutrition Education

- Education
- Make sure a clear plan is in place
- High calorie/high protein meal and snack ideas
  - Cook or add oils to food
  - Add butter
  - Add cream
  - Add gravy
- Stop providing sweetened drinks
- Recipes
- Nutrition shake
  - Whole milk
  - Greek yogurt

- Provide handouts
- Concentrated formula mixing for infants
  - Include recipe
- Commercial supplements
  - More expensive
  - Consider accessibility
- Try to provide adequate calories by mouth before considering enteral nutrition

Photo accessed from: https://blog.marketo.com/2010/10/b2b-marketing-posts.html/open-book-2

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Intervention Tools

- Caregiver education
  - Proper resources
    - Handouts
    - Recipes
    - Menu ideas
    - Blank food logs for follow up appointments
    - WIC script/SNAP assistance
  - Feeding Therapy
- Coordinated care and flow
  - Provider training and proper education
    - Team communication
    - Including proper disciplines

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MONITORING & FOLLOW UP

FOLLOW UP VISITS SHOULD BE FREQUENT UNTIL PROGRESS IS SHOWN

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MONITORING & FOLLOW UP

- Weight changes are assessed better over a period of time rather than daily
- Infants need to be assessed more frequently than older children
- Review plan of care and intake logs

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Monitoring & Follow Up

- Can typically by followed in Outpatient setting
  - Several visits will be needed to determine weight gain and monitor intake
- Most often a patient need to be admitted unless there are safety concerns or acute needs
  - Neglect or abuse
  - Dehydration
  - Refeeding syndrome
  - Complex referrals need to be facilitated3
  - Multiple days of no weight gain after intervention is initiated
- Home visits (more appropriate for inorganic FTT)

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Evaluation

- Make sure they are meeting recommended growth parameters in weight, length/height, and head circumference (if applicable)
- Discuss previous nutrition education topics.
  - Ensure parents clearly understand the nutrition plan from the previous appointment
  - Address new questions
- Make sure the infant or child is getting adequate nutrition for growth and development
  - Enough formula for infants
  - A variety of foods for children

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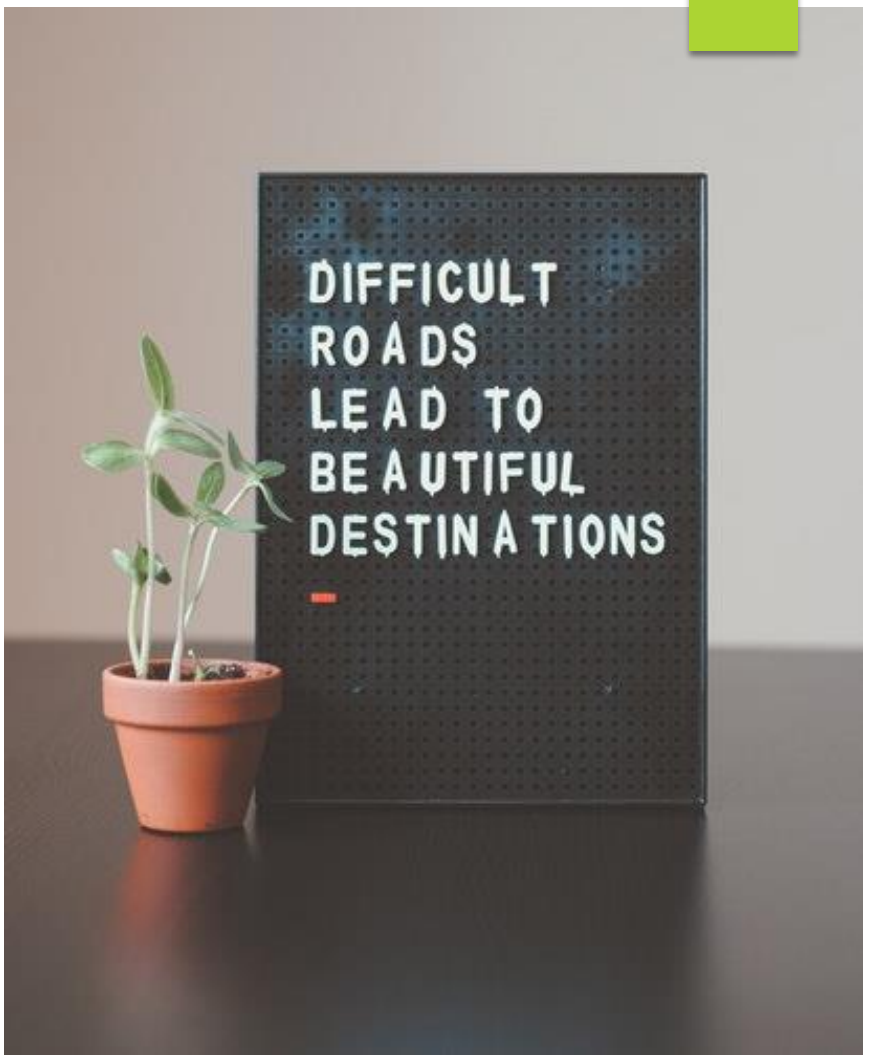
In Conclusion

- Failure to thrive is not a clearly defined medical diagnosis
- Failure to thrive is often multifactorial
  - Not taking, not being offered, or not retaining adequate calories
- Multiple disciplines are often needed to improve the outcome for a patient with FTT
- As soon as Failure to thrive is diagnosed a nutrition intervention should be initiated
- Make sure the care plan is clear and parent has been properly educated
- The patient should have frequent follow ups until their weight gain has improved, and is stable



Picuture accessed from http://www.revivalnutritioncounseling.com/initial-nutrition-assessment/

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