Atrium Health
Levine Children's

Better Nutrition, Better Care: An initiative to improve early identification and intervention of malnutrition in pediatric oncology and BMT patients

Holly Hirsch, RDN CNSC LDN Courtney Huddle, MS RDN LDN Chandler Kasay, RDN LDN
Jamie Mochel, MSN CPNP-AC Mehgan Beverley, MS Emita Clark, BS Beth Sharry, BSN RN

Introduction

Children and adolescents with cancer are at increased risk of presenting with and developing malnutrition. In a previous nutrition screening survey in our clinic, it was found that approximately 30% of solid tumor and leukemia/lymphoma patients are at nutritional risk. Due to the cyclic nature of cancer therapy, the identification of malnutrition can be easily missed and often leads to increased risk of morbidity and mortality.

Major barriers for appropriate identification are the need for education on standardized language across the multidisciplinary team and the lack of a nutrition algorithm for the management of malnutrition. As part of a larger quality improvement (QI) project, Nutrition Best Practice Guidelines were developed to serve as a reference for diagnostic criteria along with providing a nutrition algorithm to guide treatment decision-making for malnutrition.

Goals

Data collection began in July 2019 and continued through September 2020

The measured goals for this project are to:

- Increase the percentage of patients with a new diagnosis who receive a nutrition consult within 30 days of diagnosis to 80%
- Decrease the incidence of malnutrition to 44%

Guideline Development

Nutrition Best Practice Guidelines were established to function as a reference for diagnostic criteria and as a nutrition algorithm to guide treatment decision-making for malnutrition. These guidelines aimed to standardize care by developing a dietitian referral process to streamline transition from the inpatient to the outpatient setting. These guidelines were refined through multiple PDSA cycles.

Atrium Health
Levine Children's

LC-CBD Nutrition Guidelines

Inclusion criteria: On Therapy and up to 1 year post transplant pediatric patients in LC-CBD clinic and LCH 11

Initial Diagnosis

- Consult RD to perform a full nutrition evaluation within 30 days of diagnosis. Family will receive:
  Kcal/fluid goals
  Recipes/Tips & Tricks
  Sample calorie count sheets
  Expectations during treatment
- RD to document nutrition status at diagnosis
- RD to send referral for benefits investigation/pre-auth for enteral tube supplies/formula

Monitoring Guidelines

- RD to track weight changes using diagnosis weight on a monthly basis at minimum or as needed per consult request
- RD to complete calorie count assessment
- RD to perform nutrition-focused physical exam

Indications for advanced nutrition support

- **Consider Gtube placement if**:
  Requiring use of NG/ND for > 3 months (or if patient will require gtube at diagnosis)
- **Consider TPN initiation if:**
  ⇒ Grade III mucositis or greater
  ⇒ GI intolerance for > 48hrs for 0-2 years // 3 days for 2-6 years // 5 days for 7-12 years // 7 days for 13-adult age
  ⇒ Malabsorption

No Risk defined as patients who do not meet malnutrition criteria

- RD to provide chart review on a monthly basis at minimum
- RD available for consult PRN

Mild Malnutrition defined as 5-7.4% weight loss (over any period of time), **OR** < 75% of norm for expected wt gain (ages 0-2 years), **OR** BMI z score –1 to –1.9, **OR** < 75% PO intake x 1 week

Add appetite stimulant *(dosing per Pharmacy)*

- First: Marinol (Dronabinol Capsule: 2.5 mg (formulary item); 5 mg/mL solution; they are not bioequivalent and should not be used interchangeably. Oral Capsules 5 mg/m2 given prior to 2-3 meals/day (Maximum of 10 mg/dose). Liquid option: Can be administered through silicone-based enteral feeding tubes but must flush with 30 mL water.
- Second: Periactin (Cyproheptadine hydrochloride) 2 mg/5 mL: Tablet, Oral; Generic: 4 mg). Children > or = 2 years and Adolescent: 0.1 mg/kg/dose BID (maximum of 16 mg/day)

Add oral supplements (see page 2)

*If impending emetogenic chemotherapy or radiation therapy, consult RD and CORTRAK team for ND placement (if inpatient place NG); begin enteral nutrition

Moderate Malnutrition defined as 7.5-9.9% weight loss (over any period of time), **OR** < 50% of norm for expected wt gain (ages 0-2 years), **OR** BMI z score –2 to –2.9, **OR** < 50% PO intake x 2 week

Consult RD and CORTRAK team to coordinate ND placement (if inpatient place NG); begin enteral nutrition unless patient meets criteria for TPN initiation.

Severe Malnutrition defined as > 10% weight loss (over any period of time), **OR** < 25% of norm for expected wt gain (ages 0-2 years), **OR** BMI z score > –3, **OR** < 25% PO intake x 1 month

Consult RD and CORTRAK team to coordinate ND placement (if inpatient place NG); begin enteral nutrition unless patient meets criteria for TPN initiation.

Last revised 11/4/2019

Atrium Health
Levine Children's

LC-CBD Nutrition Guidelines

Inclusion criteria: On Therapy and up to 1 year post transplant pediatric patients in LC-CBD clinic and LCH 11

Oral supplements

Milk-based: Pediasure 1.0, Pediasure 1.5, Boost VHC, Ensure Enlive, Ensure Plus, Ensure High Protein, **Orgain Kids (organic)**

Soy: Bright Beginnings Soy

Plant-based/Allergy-Friendly: **Kate Farms Pediatric Standard 1.2, Kate Farms Pediatric Peptide 1.5**

Modulars to mix into drinks/food: Benecalorie, Beneprotein, Duocal, Liquigen, Unjury TF

Food: Gelatein (High Protein Jell-O), Thrive (Gelato), Magic Cup (ice cream)

Bolded are available outpatient only

Criteria to discontinue nutrition support

1. RD consult for evaluation
2. Discontinue TPN support once able to meet ~75% of estimated needs via enteral feeds OR by mouth for at least 3 consecutive days
3. Discontinue NG/ND feeds once able to meet ~75% of estimated needs by mouth for at least 1 week. Tube removal may be dependent upon remaining chemotherapy plan.
4. Consider g-tube removal once patient demonstrates ability to meet ~75% of estimated needs by mouth without use of g-tube for supplemental feeds for 1 month.

Definitions:

*CORTRAK is only available for ND placements in the outpatient setting at this time. NG tubes will be available for placement for inpatient admissions.

1. BMI-for-age is interpreted by using the Z-score classification system. The Z-score system expresses the anthropometric value as a number of standard deviations or Z-scores below or above the reference mean.
2. Growth Parameters

Age	Weight (grams)	Height (cm/week)
0 - 4 months	23 - 34 g/day	0.8 - 0.93
4 - 8 months	10 - 16 g/day	0.37 - 0.47
8 - 12 months	6 - 11 g/day	0.28 - 0.37
12 - 16 months	5 - 9 g/day	0.24 - 0.33
16 - 20 months	4 - 9 g/day	0.21 - 0.29
20 - 24 months	4 - 9 g/day	0.19 - 0.26
2 - 6 years	While growth patterns vary among children, from ages 2 years to puberty, children gain an average of 2 -3 kg/year and grow in height 5 - 8 cm/yr.	
6 - 10 years		

References

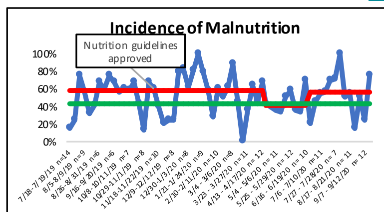
Becker PJ, Carney LN, Corkins MR, Monczka J, Smith E, Smith SE, et al. Consensus Statement of the Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition: Indicators Recommended for the Identification and Documentation of Pediatric Malnutrition (Undernutrition). J Acad Nutr Diet. 2014;114(12): 1988-2000.

Bunting, K. and Abrams, S. (2013). Pediatric nutrition reference guide 2013. Houston, Tex.: Texas Children's Hospital.

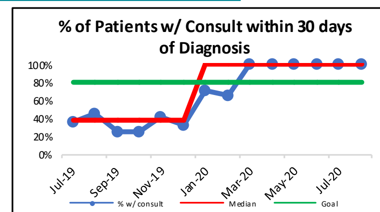
Who.int. (2019). WHO | Description. [online] Available at: https://www.who.int/nutgrowthdb/about/introduction/en/index4.html [Accessed 25 Sep. 2019].

Last revised 11/4/2019

Results/Outcomes



Incidence of Malnutrition is an outcome measure defined through a weekly random sampling of patients to capture any patient with any incidence of malnutrition with a goal of decreasing the percentage presenting to 44% or less. The denominator represents all patients with an incidence of malnutrition. An incidence is defined as a nutrition status upon evaluation of Severe, Moderate, or Mild. A run chart demonstrates a median shift after non-random variation from 58% to 41% indicating an improvement in the process.



% of Patients w/ Consult within 30 days of Diagnosis is a process measure defined through the completion of an Initial Consult for newly diagnosed patients within 30 days of their diagnosis with a goal of 80% receiving. The denominator represents all newly diagnosed patients who would receive a nutrition consult. A run chart demonstrates a median shift after non-random variation from 39% to 100% has been sustained indicating an improvement in the process.

Conclusion

Standardization of care and language regarding malnutrition has increased understanding and awareness of this complex topic in pediatric oncology and led to improvement in time to intervention and overall decreased incidence of malnutrition.

Contact Info

Holly Hirsch Holly.hirsch@atriumhealth.org

Chandler Kasay Jillian.kasay@atriumhealth.org

Mehgan Beverley Mehgan.Beverley@atriumhealth.org

Courtney Huddle Courtney.Huddle@atriumhealth.org

Acknowledgements

Thank you to all of the teammates in the Pediatric Cancer, Blood Disorders, & Cellular Therapies Department & Levine Children's Hospital 11th Floor Staff, and Lauren Littmann, MS RD LDN.