



We Treat Kids Better

## **Nutritional Considerations in Pediatric Oncology: An overview and multidisciplinary panel discussion**

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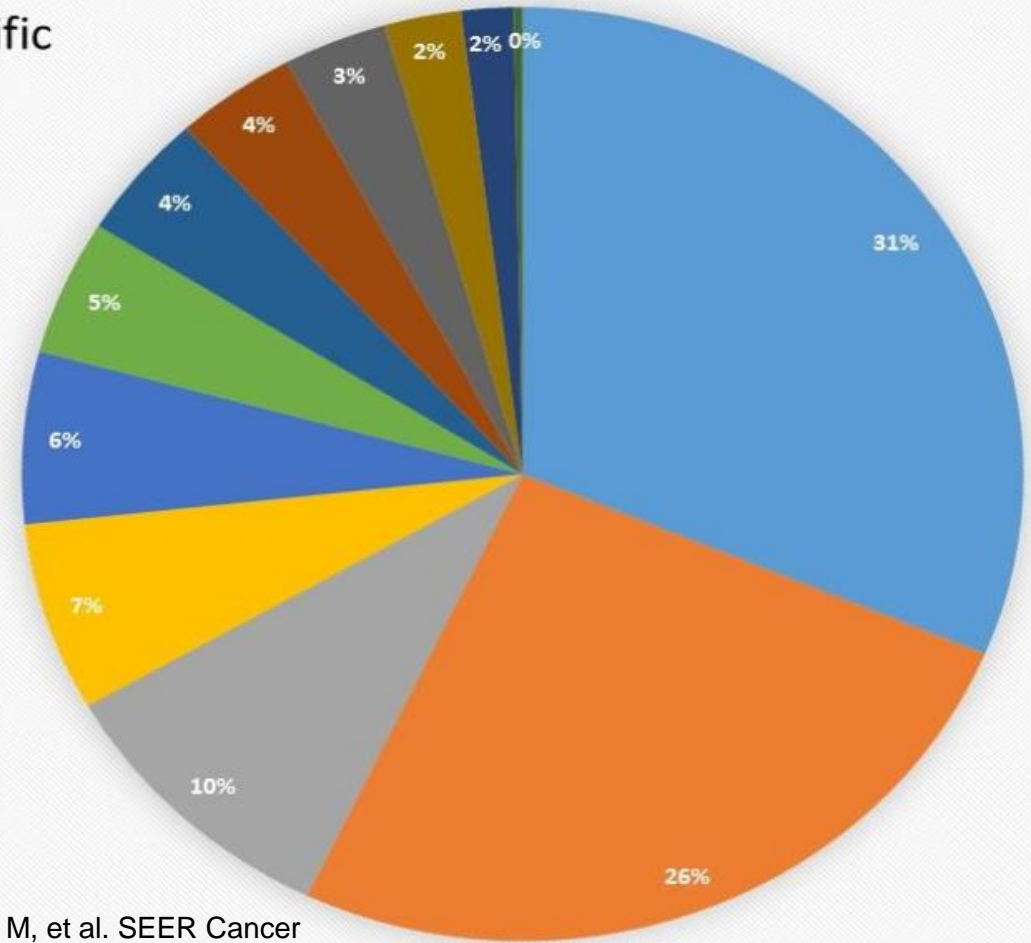
# Objectives

1. Identify common nutritional concerns in the pediatric oncology population.
2. Describe appropriate nutritional interventions and when they are indicated.
3. Understand the nutritional implications of some key medications used in this population.
4. Understand the importance of working closely with a multidisciplinary care team for a successful nutrition intervention.

## Prevalence of Pediatric Cancer

### Age-Adjusted and Age-Specific Cancer Incidence Rates for Patients Aged 0–14 Years (SEER 2009–2012)

- Leukemia
- CNS
- Lymphoma
- Soft tissue
- Neuroblastoma
- Renal
- Bone
- Epithelial
- Germ cell
- Retinoblastoma
- Liver
- Other

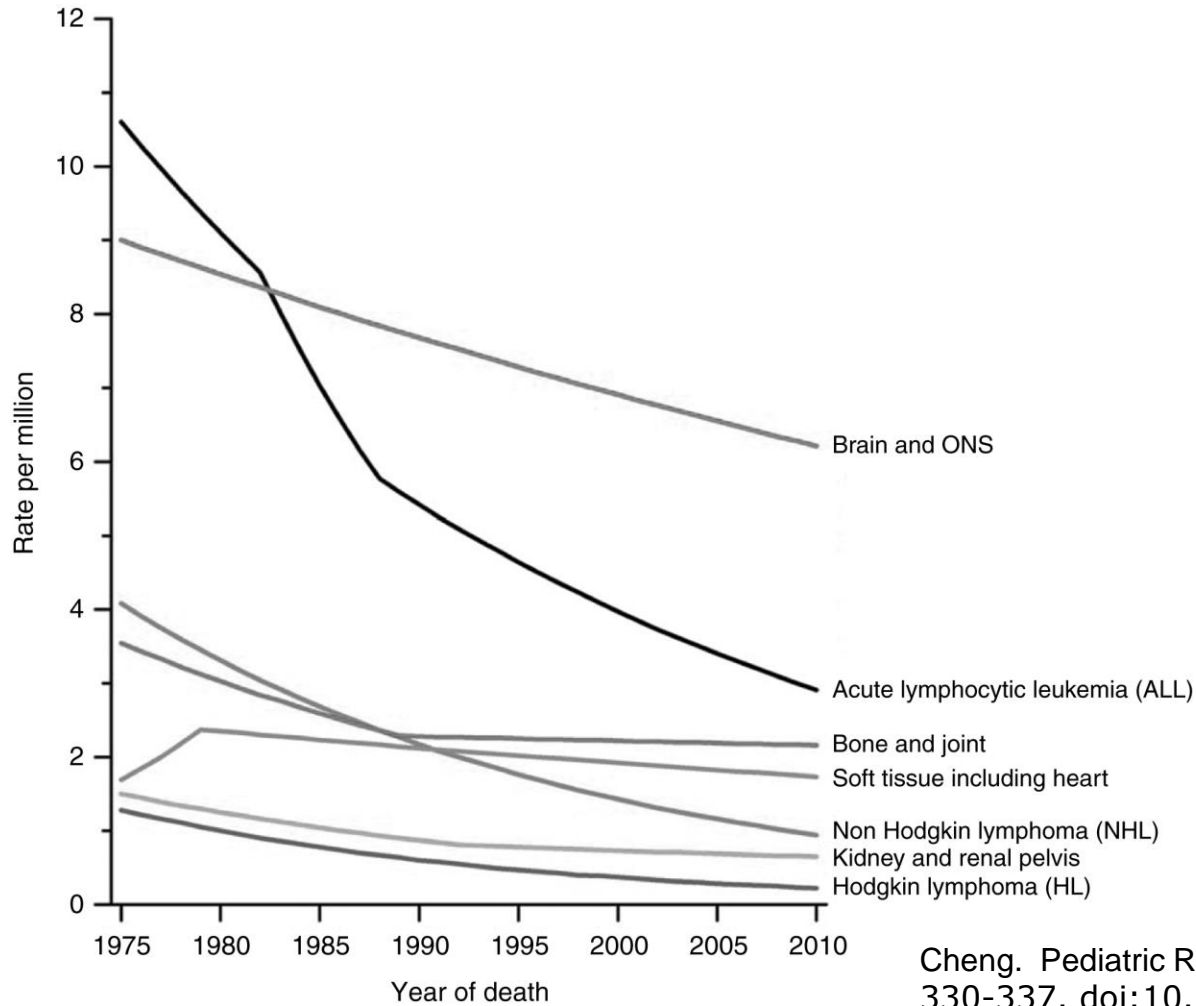


Howlader N, Noone AM, Krapcho M, et al. SEER Cancer Statistics Review 1975-2012. Bethesda, MD: National Cancer Institute. 2015.

## Childhood Cancer's with High Nutrition Risk

- Wilms' Tumor - stages III and IV, and relapsed
- Neuroblastoma - stages III and IV, and relapsed
- Metastatic Solid Tumors
- Non-Hodkin's Lymphoma (Stages III and IV, and relapsed)
- AML and CML
- ALL w/poor prognosis (high risk and relapsed)
- Brain Tumors

# Survival rates are improving - need to focus on supportive care



Cheng. Pediatric Research. (2016) **80**, 330-337. doi:10.1038/pr.2016.95

## Clinical Implications of Poor Nutrition

- Protein calorie malnutrition is associated with increased infection rate, decreased tolerance of chemotherapy, and diminished quality of life
  - Likely impacts survival - may be different across different cancers
- Obesity at diagnosis for AML associated with increased risk of death from side effects
- Obesity during ALL associated increased risk for relapse and increased side effects of chemotherapy

Co-Reyes, et al. *Ped Blood Cancer*. 2012 Dec 15; 59(7): 1160-1167

Sung, et al. *Excess Treatment-Related Mortality in Obese Children and Adolescents with AML.*

- Should include:
  - Baseline eating habits/patterns
  - Home food environment
  - Anthropometrics (weight, height, BMI, MUAC if possible)
  - Review of nutritional labs
    - Normative lab values often not necessarily indicative of nutritional status (e.g., creatinine, albumin, hematocrit, hemoglobin)
    - Must consider lab values in context of overall clinical picture
  - Review of GI concerns (n/v/d/c; pain with eating, appetite/hunger; taste changes)
  - Diet recall
  - Dietary supplements
  - Evaluation for protein calorie malnutrition

# Indicators of Protein Calorie Malnutrition

Primary Indicators*	Mild Malnutrition	Moderate Malnutrition	Severe Malnutrition
Weight for height z score	-1 to -1.9 z score	-2 to -2.9 z score	-3 or greater z score
BMI <sup>a</sup> for age z score	-1 to -1.9 z score	-2 to -2.9 z score	-3 or greater z score
Length/height z score	No data	No data	-3 or greater z score
Mid-upper arm circumference (MUAC)	-1 to -1.9 z score	-2 to -2.9 z score	-3 or greater z score
Weight gain velocity (<2 years of age)	<75% of the norm <sup>b</sup> for expected weight gain	<50% of the norm <sup>b</sup> for expected weight gain	<25% of the norm <sup>b</sup> for expected weight gain
Weight loss (2 to 20 years of age)	≥5% usual body weight	≥7.5% usual body weight	≥10% usual body weight
Deceleration in weight for length/height z score	Decline of 1 z score	Decline of 2 z score	Decline of 3 z score
Inadequate nutrient intake	51 to 75% estimated energy/protein need	26 to 50% estimated energy/ protein need	≤ 25% estimated energy/protein need

Mehta, et al. Defining Pediatric Malnutrition. JPEN 2013.



## Common Nutritional Concerns And Treatment Recommendations

Nutritional Concern	Treatment Recommendations
Anorexia	Small, frequent, high-calorie meals; supplements; appetite stimulants; nutrition support
Nausea and Vomiting	Small, frequent, bland meals; supplements; anti-nausea/anti-emetic meds; nutrition support
Feeding Difficulties (from alterations in brain or GI tract)	Altered textures; nutrition support
Diarrhea	Bland diet, avoiding laxative foods, nutrition support
Constipation	Laxatives, high fiber diet, adequate fluids

## Common Nutritional Concerns And Treatment Recommendations

Nutritional Concern	Treatment Recommendation
Mucositis	Magic mouthwash, soft foods, liquids/shakes, nutrition support
Taste Changes	Add flavor to foods using spices, marinades, etc. Also tart/sour flavors from citrus and vinegar can help.
Hyperglycemia	Low concentrated sweets; balanced, healthful meals/snacks; possible temporary insulin/CHO counting
Obesity	Wellness counseling, referrals to secondary and tertiary care programs, appropriate subspecialty referrals

# Common Medications and Nutritional Implications

Medication/Treatment	Side Effects
Chemotherapies	Cisplatin – nausea/vomiting Methotrexate – n/v, mucositis Vincristine – diarrhea, ileus
Radiation	Hypothalamic obesity Dysphagia
Corticosteroids	Increased appetite/weight gain Hyperglycemia Vit/Min deficiencies (D, folate, C, B6, phos, Ca)

## Common Medications Used to Treat Nutritional Concerns

Medication	Usage
Periactin (ciproheptadine) Megace (used less often b/c hormone)	Appetite stimulation
Zofran Kytril Scopolamine Ativan Benadryl	Anti-nausea / Anti-emetic
MiraLAX Colace Lactulose Senna	Stool softeners/laxatives
Ranitidine	Acid Reflux

- Primary goals:
  - Sustain and promote normal growth and development
  - If protein calorie malnutrition is identified, address/reverse
- Secondary goal:
  - Prevent future protein calorie malnutrition
- Working closely with a multidisciplinary care team helps ensure that nutrition intervention/support is initiated in a timely manner
  - There are many factors to consider when deciding to initiate nutrition support
  - The RD is essential in this process - nutrition should be integrated, not ancillary!
- Address obesity as it will impact treatment in certain types of cancers, and also comorbidities in survivorship

## When to Intervene?

- At baseline - overview of common nutritional concerns/complications, basic nutrition education, and possible interventions during treatment
- Mild protein calorie malnutrition
  - Oral supplements
  - Appetite stimulant
- Moderate protein calorie malnutrition
  - Try oral supps + appetite stimulant
  - Nutrition support (EN; PN only if indicated and necessary)
- Severe protein calorie malnutrition
  - Nutrition support (EN; PN only if indicated and necessary)
- **\*\*These are general guidelines - You need to work with your interdisciplinary team\*\***

## Considerations with Tube Feeding

- Be positive not punitive
  - Weight loss is not a failure
- Discuss early on in treatment to normalize the intervention
- Team approach
  - RD, MD, NP, SW, Child Life, parents, etc.
- Educate on mechanics of enteral feeds to dispel myths and fears
  - Can still eat by mouth
  - Might be uncomfortable but should not be painful
  - Can individualize feeding plan/schedule to meet patient and family needs
- Earlier we intervene with feeds, potentially the shorter the duration feeds are needed

Panelists:

Etan Orgel, MD, MS  
Attending Physician

Jacqueline O'Connell, MSN, MPH, RN, PNP-BC  
Nurse Practitioner

Jennifer Reyes, LCSW, ACM-SW, OSW-C  
Clinical Social Worker

