Optimizing Preoperative Nutrition

Charles E Johnston MD
Wendy Wittenbrook MA,RD,CSP,LD

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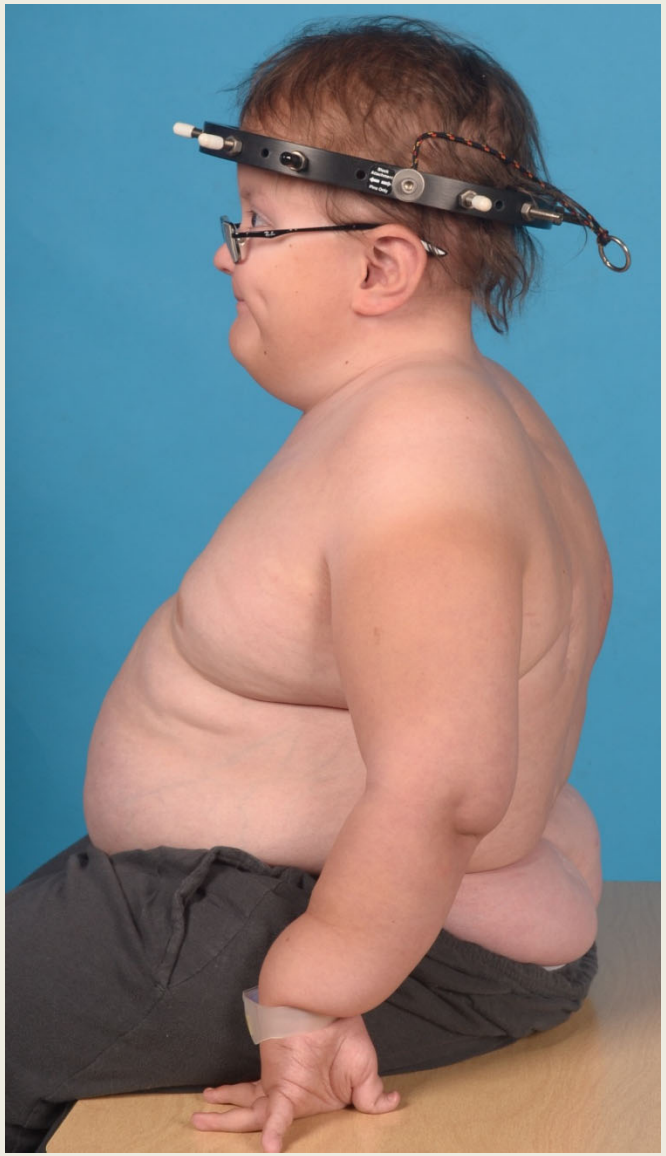
Preop Under-Nutrition

- Impedes wound healing
- Increases risk of Superior Mesenteric Artery Syndrome
- Pre-op Goal = Weight gain and adequate stores of nutrients for wound healing
- < 3rd %ile absolute weight or < BMI

Preop Over-Nutrition

- Overweight does not mean properly nourished – risk remains
- Weight loss pre- and post-operatively can increase infection risk post-op
- High blood glucose levels impede wound healing
- Pre-op Goal = Stable weight and adequate stores of nutrients for wound healing



Preop Checklist

- Height - difficult to obtain accurate height in EOS patient
    - Arm span
    - Recumbent length
- Weight (BMI > 35 -> risk for SSI)
    - Goal weight for surgery
    - Typically 10% weight gain goal if underweight
- Visual assessment for bony prominences, skin breakdown, vulnerable areas (skin folds/creases related to deformity), scarring
- Skin fold measurements : Triceps skin fold ≥ 10%ile/age or serial increase (standards not determined)

Labs

- CBC (absolute lymphocyte count > 1500*)
- Iron profile (incl. transferrin >200 mg/dL*)
- C-reactive protein
- Zinc (> 95 µg/dL*)
- Glucose (< 125 mg/dL*)
- Albumin (>3.5 mg/dL*)
- Prealbumin (16-35 mg/dL*)
- 25-OH vitamin D
- B12

* Cross et al, JAAOS 3/14

Protein !

Medical

- Pulmonary – ↑RR impairs PO intake
- Dysphagia / aspiration – n
  Video Ba swallow
- GERD
- 1° GI disease (short bowe
  malabsorption, delayed ga

✓ strong indication(s) for G-button / tube feeds/ trach

Golden triad/ quartet

- Trach
- Port
- G t
- HG

Nutrition Needs

- Energy needs – Dietary Reference Intake (DRI)
- Protein needs
  - 2 g/kg body weight
- Fluid needs
  - Prevent constipation (neuro patients !)
  - Very important in enterally fed patients
- Calcium intake
  - DRI for age
  - Supplement as needed
- Vitamin D intake
  - DRI for age
  - Supplement as needed
- Multivitamin with Iron

Estimate Energy Needs (kcal/d)

EQUATIONS TO ESTIMATE ENERGY REQUIREMENT: AGES 0-18 YEARS

Infants and Young Children

Estimated Energy Requirement (kcal/day) = Total Energy Expenditure + Energy Deposition

0-3 months	EER[a] = (89 x weight [kg] – 100) + 175
4-6 months	EER = (89 x weight [kg] – 100) + 56
7-12 months	EER = (89 x weight [kg] – 100) + 22
13-35 months	EER = (89 x weight [kg] – 100) + 20

Children and Adolescents 3-18 years

Estimated Energy Requirement (kcal/day) = Total Energy Expenditure + Energy Deposition

BOYS	3-8 years	EER = 88.5 – (61.9 x age [y]) + PA[b] x [(26.7 x weight [kg]) + (903 x height [m]) + 20
	9-18 years	EER = 88.5 – (61.9 x age [y]) + PA x [(26.7 x weight [kg]) + (903 x height [m]) + 25
GIRLS	3-8 years	EER = 135.3 – (30.8 x age [y]) + PA x [(10.0 x weight [kg]) + (934 x height [m]) + 20
	9-18 years	EER = 135.3 – (30.8 x age [y]) + PA x [(10.0 x weight [kg]) + (934 x height [m]) + 25

NOTE: These equations provide an estimate of energy requirement. Relative body weight (i.e., loss, stable, gain) is the preferred indicator of energy adequacy.

[a] **EER** = Estimated Energy Requirement

[b] **PA** = Physical Activity Coefficient

Source: This table is derived from the DRI report: see **http://nap.edu**

Physical/Stress Modifiers

Physical activity coefficients (PA), DRI (ages 3-18 years)

GENDER	SEDENTARY	LOW ACTIVE†	ACTIVE††	VERY ACTIVE†††
Boys	1.00	1.13	1.26	1.42
Girls	1.00	1.16	1.31	1.56

† (30-60 Mins. Daily moderate activity)

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††† (120 Mins. Daily moderate activity, or 60 mins. Moderate + 60 mins. Vigorous activity)

ACTIVITY FACTORS		STRESS FACTORS			
Paralyzed	1.0	Surgery	1.2-1.5	Burn	1.5-2.5
Confined to bed	1.1	Infection	1.2-1.6	Starvation	0.7
Ambulatory	1.2-1.3	Trauma	1.1-1.8	Growth Failure	1.5-2.0

From Nutrient Requirements. In Page CP, Hardin TC, Melnik G (eds): Nutritional Assessment and Support—a Primer, ed 2. Baltimore: Williams and Wilkins, 1994;32. Reprinted with permission.

Importance of Nutrition

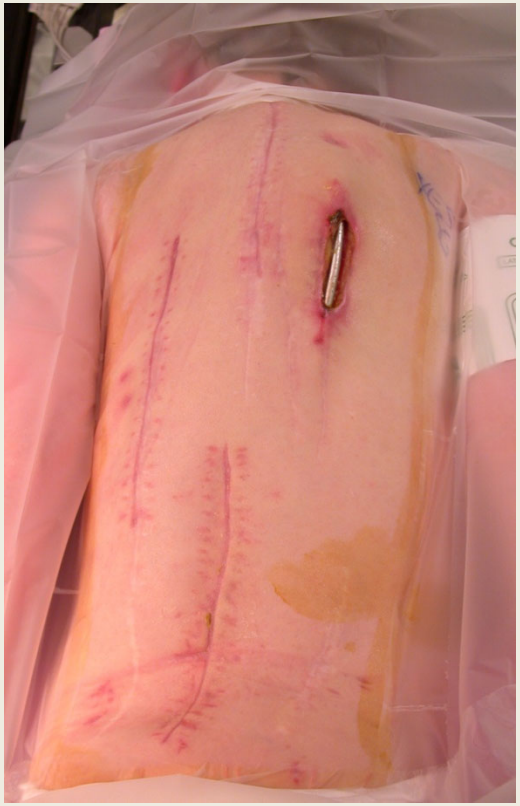
- TIS patients have increased energy expenditure (work of breathing)
- Normal nutritional intake depleted by work of breathing -> no weight gain
- EOS pts < 5th %ile = "failure to thrive"

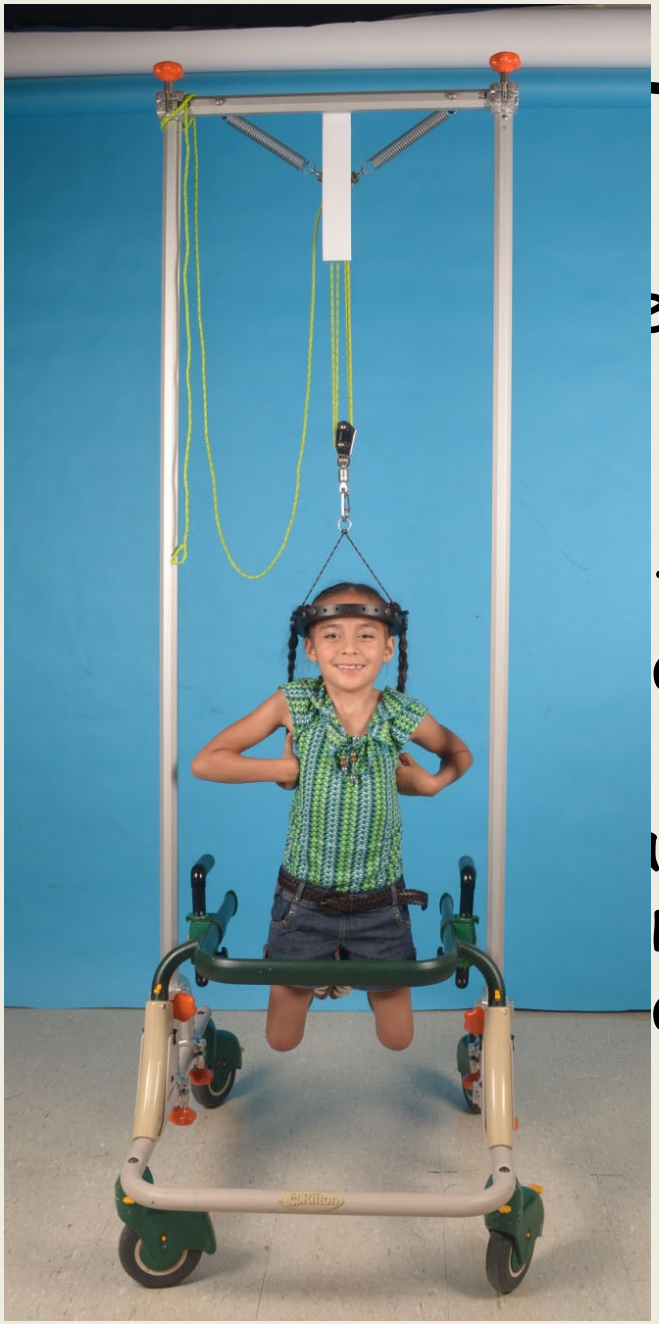
  -> 47% GRI pts (Myung)

  -> 79% Veptr pts (Skaggs)

Adequate Nutrition

- Wound healing
- Infection rate
- Serial surgical procedures – *beware* revisions





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y,
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- Trach
- Port
- G button
- HGT -> work on improved nutrition while gaining correction and pulmonary reserve

TEXAS SCOTTISH RITE HOSPITAL FOR CHILDREN

charles.johnston@tsrh.org