حل کیس بیماران ویژه

زکیه فضیلتی

کارشناس ارشد تغذیه

A nutrition risk **indicator** nutrition therapy

- Nutritional risk screening [NRS 2002]
- NUTRIC score

- All patients admitted to the ICU for whom volitional intake is anticipated to be insufficient.
- High nutrition risk identifies those patients most likely to benefit from early EN therapy.

- We suggest not using traditional nutrition indicators or surrogate markers, as they are not validated in critical care.

Should protein provision be monitored independently from energy provision in critically ill adult patients?

- In the critical care setting, protein appears to be the most important macronutrient for:
- healing **wounds**
- supporting **immune** function
- maintaining **lean body mass**.

C. Dosing of EN

low- to moderate-risk patients

Trophic feeds (usually defined as 10–20 mL/h or 10–20 kcal/h) may be sufficient to:

- prevent mucosal atrophy
- and maintain gut integrity

high-risk patients

- >50%–65% of goal energy may be required to prevent:

✓increases in intestinal permeability

✓and systemic infection

in **burn** and **bone marrow transplant** patients,

❑to promote faster return of cognitive function in **head injury** patients,

❑ and to reduce mortality in **high-risk hospitalized** patients.

protein & clinical outcomes

- sufficient (high-dose) protein should be provided.
- Protein requirements are expected to be in the range of 1.2–2.0 g/kg **actual body weight** per day.
- and may likely be even higher in **burn** or **multiple trauma** patients.

GI intolerance definition

- vomiting,
- abdominal distention,
- complaints of discomfort,
- high NG output, high GRV,
- diarrhea,
- reduced passage of flatus and stool,
- or abnormal abdominal radiographs

Question: Should GRVs be used as a marker for aspiration to monitor ICU patients receiving EN?

- D2a. We suggest that GRVs not be used as part of routine care to monitor ICU patients receiving EN.
- D2b. We suggest that, for those ICUs where GRVs are still utilized, holding EN for GRVs <500 mL in the absence of other signs of intolerance (see section D1) should be **avoided.**
- GRVs do **not correlate** with incidences of pneumonia, regurgitation, or aspiration.

patients at high risk for aspiration

- diverting the level of feeding by postpyloric enteral access device placement in patients deemed to be at high risk for aspiration

- high-risk patients or those shown to be intolerant to bolus gastric EN, delivery of EN should be switched to continuous infusion.

patients at high risk for aspiration

- agents to promote motility, such as prokinetic medications (metoclopramide or erythromycin), be initiated where clinically feasible

- In all intubated ICU patients receiving EN, the head of the bed should be elevated 30°–45° and use of chlorhexidine mouthwash twice a day should be considered.

- How should diarrhea associated with EN be assessed in the adult critically ill population?

- EN not be automatically interrupted for diarrhea but rather that feeds be continued while evaluating the etiology of diarrhea in an ICU patient to determine appropriate treatment.

Definition of diarrhea

- 2–3 liquid stools per day or >250 g of liquid stool per day.

The following factors may contribute to acute diarrhea:

- type and amount of fiber in formula
- osmolality of formula
- delivery mode
- EN contamination
- Medications
- infectious etiologies, including Clostridium difficile

Medications contribute to acute diarrhea

- Antibiotics
- proton-pump inhibitors
- Prokinetics
- glucose lowering agents
- nonsteroidal antiinflammatory drugs
- selective serotonin reuptake inhibitors
- laxatives, and sorbitol-containing preparations

- An attempt should be made to distinguish infectious diarrhea from osmotic diarrhea

- a fermentable soluble fiber additive (eg, fructooligossaccharides [FOSs], inulin) be considered for routine use in all hemodynamically stable MICU/SICU patients placed on a standard enteral formulation.

- We suggest that 10–20 g of a fermentable soluble fiber supplement be given in divided doses over 24 hours as adjunctive therapy if there is evidence of diarrhea.

role or harm of probiotic administration in critically illness

- We cannot make a recommendation for the routine use of probiotics across the general population of ICU patients
- There appears to be some beneficial effect of certain probiotic species (primarily **Lactobacillus GG**) in decreasing the incidence of **overall infectious complications and VAP**
- Studied probiotics may be considered for use in selective patient populations (eg, liver transplantation, trauma, pancreatectomy) colitis, and antibiotic-associated diarrhea

role or harm of probiotic administration in critically illness

- cases of fungemia in ICU patients associated with the use of Saccaromyces boulardii

- **worsened** clinical outcomes in **severe pancreatitis** patients

antioxidants and trace minerals

- F3. We suggest that a combination of antioxidant vitamins and trace minerals in **doses reported to be safe in critically ill** patients be provided to those patients who **require specialized nutrition therapy**.

- Antioxidant vitamins (including vitamins E and C [ascorbic acid])
- and trace minerals (including selenium, zinc, and copper)
- may improve patient outcome, especially in burns, trauma, and critical illness requiring mechanical ventilation

- Renal function should be considered when supplementing vitamins and trace elements.

- Do immune-modulating enteral formulations have an impact on clinical outcomes for the critically ill patient regardless of the ICU setting?
- immune-modulating enteral formulations (arginine with other agents, including eicosapentaenoic acid [EPA], docosahexaenoic acid [DHA], glutamine, and nucleic acid)
- **should not be used routinely** in the MICU. Consideration for these formulations should be reserved for patients with TBI and perioperative patients in the SICU

- The rationale for pulmonary formulas (high fat to carbohydrate to reduce respiratory quotient) has been shown to be erroneous (effect seen only with overfeeding), and their high content of omega-6 fatty acid may drive inflammatory processes.

G. When to Use PN

patient at low nutrition risk

- We suggest that, in the patient **at low nutrition risk** (eg, NRS 2002 ≤3 or NUTRIC score ≤5), exclusive PN be withheld over the first 7 days following ICU admission if the patient cannot maintain volitional intake and if early EN is not feasible.

- Patients who have a diagnosis that makes them **PN dependent (**eg, short bowel) should continue their PN upon admission to the ICU unless bacteremia is suspected

patient at high nutrition risk?

- G2.in the patient determined to be at high nutrition risk (eg, **NRS 2002 ≥5 or NUTRIC score ≥5**) or severely malnourished, when EN is not feasible, we suggest initiating exclusive PN **as soon as possible** following ICU admission.

optimal timing for initiating supplemental PN

in patients at **<u>either low or high nutrition risk</u>**:

- use of supplemental PN be considered after 7–10 days if unable to meet >60% of energy and protein requirements by the enteral route alone.
- Initiating supplemental PN prior to this 7- to 10-day period in critically ill patients on some EN **does not improve** outcomes and may be **detrimental** to the patient

H. When Indicated, Maximize Efficacy of PN

strategies to improve PN efficacy

- the use of protocols and nutrition support teams to help incorporate strategies to maximize efficacy and reduce associated risk of PN.

Management of PN should include attention to:

- rate of advancement of feeding
- glycemic control
- electrolyte monitoring
- and repletion (evidence of refeeding)
- duration of PN
- and transition to EN as feasible.

- Attention to refeeding syndrome is especially important for the patient with risk factors:
- alcoholism
- weight loss
- low body mass index [BMI]
- prolonged periods NPO.

- Although refeeding syndrome can occur with EN, the risk is higher with initiation of PN.

- In those patients, advancement of feeding should be slower, taking 3–4 days to reach goal. Use of protocols and nutrition support teams have been shown to decrease PN-associated complications

- Question: In the appropriate candidate for PN (high risk or severely malnourished), should the dose be adjusted over the first week of hospitalization in the ICU?

- H2. We suggest that hypocaloric PN dosing (≤20 kcal/ kg/d or 80% of estimated energy needs) with adequate protein (≥1.2 g protein/kg/d) be considered in appropriate patients (high risk or severely malnourished) requiring PN, initially over the first week of hospitalization in the ICU.

- **soy-based IV fat** emulsions (IVFEs) in the first week VS

alternative IVFEs (ie, medium-chain triglycerides [MCTs], olive oil [OO], FO, mixture of oils) ?

We suggest withholding or limiting SO-based IVFE during the first week following initiation of PN in the critically ill patient to a maximum of 100 g/wk (often divided into 2 doses/wk) if there is concern for essential fatty acid deficiency.

SMOF Lipid

- H3b. Alternative (SMOF [soybean oil, MCT, olive oil, and fish oil emulsion], MCT, OO, and FO) IVFEs may provide outcome benefit over soy-based IVFEs

حل کیس جراحی

- خانم ۳۲ ساله مورد کنسر سر پانکراس با درگیری کبد و مجاری صفراوی، جراحی ویپل شده اند. به مدت یک هفته است که تغذیه اورال شروع شده اما دریافت بیمار با شکایت بی اشتهایی و دل درد بسیار کم بوده.

- درخواست مشاوره تغذیه جهت بهبود اشتها و دریافت انرژی پروتئین بیمار
- تنظیم رژیم غذایی منزل

ارزیابی تغذیه ای

۱- ارزیابی تغذیه ای آنتروپومتریک
بیمارکاشکتیک
قد ۱۶۳ سانتی متر
وزن ۴۷کیلوگرم

۲- ارزیابی بیوشیمیایی

Alb 2.7	Mg 1.2
Cr 0.5	BUN 4
Ca 8.5	P 2

حل کیس head trauma

مردی ۲۵ ساله با قد ۱۷۱ سانتی متر و وزن ۷۱ کیلوگرم . با وضعیت بالینی نرمال

تشخیص SAH –Base skull fracture – GCS=7

بیمار Intube می باشد و لوله نازوگاستریک تعبیه شده

بیمار از تاریخ ۳ تیر تا تاریخ ۱۰ تیر روزانه بیش از ۳۵۰ سی سی در روز تحمل تغذیه انترال نداشته. در تاریخ ۱۰ تیر درخواست مشاوره تغذیه شده.

ارزیابی تغذیه ای

- ارزیابی آنتروپومتریک

قد ۱۸۴سانتی متر

وزن ۷۵ کیلوگرم

با کاهش وزن از زمان بستری حدود ۱۰کیلوگرم

ارزیابی بیوشیمیایی

Albumin= ۲/۲

SGOT=۱۸۹

SGPT= ۷۳

TG= ۹۷

Total bilirubin= ۰/۴

Direct bilirubin= ۰/۱

P= ۴/۱

Na= ۱۴۳

K=۱/۴

BS= ۹۹

creatinine= ۱/۱

BUN=۱۴

حل کیس COVID-19

- خانم ۵۸ ساله مورد COVID-19 بستری در بخش مراقبت های ویژه کرونا، با سابقه دیابت، فشار خون بالا. بیمار تحت اکسیژن تراپی NIV هستند و فقط تمایل به دریافت سوپ و مایعات دارند.

قند ناشتا ۴۳۲ و قند رندوم ۵۸۸ دارند و هایپوآلبومینمی دارند. لطفا بیمار را جهت تنظیم رژیم غذایی مناسب و تنظیم قند خون مشاوره بفرمایید.

بیمار به مدت ۲ هفته است که بستری هستند و از زمان بستری ۸ کیلوگرم وزن کم کرده اند. همچنین مستعد زخم بستر هستند.

ارزیابی تغذیه ای

- ارزیابی آنتروپومتریک

قد ۱۵۳سانتی متر

وزن ۷۵ کیلوگرم

با کاهش وزن از زمان بستری حدود ۸ کیلوگرم

ارزیابی بیوشیمیایی

Albumin= ۱/۹

SGOT=۱۷۸

SGPT= ۹۸

TG= ۹۷

Total bilirubin= ۰/۴

Direct bilirubin= ۰/۱

P= ۱/۸

Na= ۱۴۳

K=۳/۱

FBS= ۵۸۸ BS= ۴۳۲

creatinine= ۰/۶

BUN=۶

حل کیس پرانترال دیابتی

- بیمار آقای ۷۴ ساله مورد diabetic foot و آمپوتاسیون پای چپ از بالای زانو که بعد از جراحی افت GCSداشته اند و گاواژ تحمل نمیکنند. ۴ روز از زمان بستری گذشته و تابحال دریافت تغذیه ای نداشته اند. لطفا TPNتنظیم شود.
- بیمار روزانه پروتکل انسولین میگیرند.

ارزیابی تغذیه ای

- ارزیابی آنتروپومتریک

قد ۱۷۳سانتی متر

وزن ۷۰ کیلوگرم

ارزیابی بیوشیمیایی

Albumin= ۲/۲

SGOT=۱۷

SGPT= ۷۹

TG= ۱۳۵

Total bilirubin= ۰/۴

Direct bilirubin= ۰/۱

P= ۱/۶

Na= ۱۴۰

K=۳/۵

BS= ۲۱۲

creatinine= ۱/۱

BUN=۱۵

حل کیس پرانترال جراحی

- بیمار آقای ۴۲ ساله مورد مینی بای پس معده قبلی حدود یک سال پیش. در حال حاضر با بی اشتهایی، تهوع، استفراغ شدید بستری شده اند و NPO هستند. سنگ صفراوی و انسداد روده ای تشخیص گذاشته شده. لطفا TPN بیمار تنظیم شود.

ارزیابی تغذیه ای

- ارزیابی آنتروپومتریک

قد ۱۴۵سانتی متر

وزن ۱۲۰ کیلوگرم

بیمار کاشکتیک است.

ارزیابی بیوشیمیایی

Albumin= ۱/۴

SGOT=۱۷۶

SGPT= ۱۴۳

TG= ۱۷۸

Total bilirubin= ۰/۴

Direct bilirubin= ۰/۱

P= ۱/۶

Na= ۱۴۰

K=۳/۵

BS= ۶۵

creatinine= ۰/۴

BUN=۱۰