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717 **Critically injured patients receiving kefir may have lower rates of Clostridium difficile**

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**Introduction:** Kefir is an easy to administer per feeding tube probiotic yogurt that does not contain the risk of powdered probiotics, which may contaminate patient wounds or intravenous lines. Previous studies show patients taking probiotics may decrease hospital-acquired infections (HAI) although kefir has not been well studied. We hypothesized that kefir would be well tolerated and prevent infections among critically injured patients including patients with burn injury on enteral nutrition (EN).

**Methods:** We performed a retrospective review of adult critically injured patients at a level 1 trauma and burn center from January 2018 to March 2021 who received EN. Patients with a history of clostridium difficile (*C. diff*) were excluded. Patients who received kefir were given 120ml twice daily. The kefir protocol was improved with input from clinical stakeholders. The rate of *C. diff*, catheter-associated urinary tract infection (CAUTI), and central line-associated blood stream infection (CLABSI) were compared between patients who received kefir and those who did not. Incidence rate ratios (IRR) and corresponding 95% confidence intervals were calculated to assess differences in these rates.

**Results:** 3,814 patients met criteria, 545 of whom received kefir (14%). Suggested improvements to the kefir protocol by stakeholders were changing flavored to plain kefir to decrease the amount of carbohydrate, change to lactose-free kefir to improve usage in lactose intolerant patients, and educate nurses on flushing feeding tubes to avoid clogs.

None of the incidence rates of HAI were significantly different between patients who received kefir and those who did not (Table 1). Crude IRRs suggest that *C. diff* infections may have occurred less frequently among patients who received kefir while the reverse occurred for CLABSI infections, though these results are not significant.

**Conclusions:** The kefir implementation was refined by stakeholder feedback. Although no clear benefit of kefir was observed with HAI reduction, future research should investigate the potential association between kefir use and *C. diff*.

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718 **Indirect Calorimetry is Necessary to Optimize Nutrition in Large Burns**

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**Introduction:** Assessing nutritional requirements in large total body surface area (TBSA) burns is a challenge due to frequent metabolic variation. Studies have compared indirect calorimetry (IC) with predictive equations and identified formulas that are frequently used in the absence of IC. Large TBSA burns remain poorly understood, as does the role of changing metabolic rate and multiple surgical procedures over the course of recovery. We sought to understand whether these equations remain reliable in these situations.

**Methods:** The patient is a 31 year old, 92% full-thickness TBSA burn who was studied over the first 75 days of hospitalization at various points per institutional IC guidelines. Using total energy expenditure (TEE) by IC as the standard, we assessed variation of each predictive equation for accuracy. Only the Milner and Toronto formulas are dynamic, and we analyzed variation by post-burn day (PBD) compared to dates of major surgical procedures in these studies. The patient was excised on PBD 1, 2, 5, 7, 9, 21, and 25; he was grafted on POD 5, 11, 20, 41, and 56. Weekly monitoring of prealbumin and CRP indicated adequate nutrition.

**Results:** On post-burn day (PBD) 5, when all major burns were excised, all predictive equations inappropriately estimated the patient's energy expenditure. On longitudinal analysis of 16 IC studies (Table 2), the Milner equation was most accurate, estimating within 5% variance of TEE at 5 time points (31%). The Toronto formula did not estimate within 5% variance at any time point. No energy equation consistently and accurately estimated energy expenditure over all calculated time points.

**Conclusions:** Although predictive equations are frequently used, in high TBSA burns with many operations and changing nutritional needs, equations are not as accurate as IC. Given that over- or under-estimating needs result in many complications avoided with IC, we propose frequent IC for intubated, high TBSA patients.