

## Commentary on “Fish Oil–Containing Lipid Emulsions in Adult Parenteral Nutrition: A Review of the Evidence”

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Abbasoglu et al published a narrative review concerning the use of fish oil–containing lipid emulsions in adult parenteral nutrition (PN).<sup>1</sup> We wholeheartedly agree with the authors when they state that “high-quality and adequately powered RCTs are necessary” and “well-conducted meta-analyses can be key to demonstrating positive or negative effects.” However, we disagree with other aspects of their review, particularly assertions of a lack of evidence in favor of using fish oil–containing lipid emulsions rather than more traditional lipid formulations.

The authors mentioned that 4 meta-analyses show a significant clinical benefit for fish oil–containing lipid emulsions. There are at least 4 additional meta-analyses that have shown such benefits,<sup>2–5</sup> so 8 meta-analyses have results significantly in favor of fish oil in adult PN, but 2 show no significant differences.<sup>6,7</sup> Both those showing no significant differences included few trials (6 in each case) and very few (<400) patients.<sup>6,7</sup> Moreover, when one was updated with additional studies, it found significantly fewer infectious complications and shorter length of hospital stay in patients given fish oil–containing lipid emulsions.<sup>8</sup>

Abbasoglu et al stated that “key medical societies are challenged to provide recommendations” for lipid emulsion choice, and that ASPEN. does not recommend one lipid emulsion over another. This is disingenuous, as ASPEN. states, “When these alternative IVFEs (SMOF [soybean oil, MCT, olive oil, and fish oil emulsion], MCT [medium chain triglycerides], OO [olive oil], and FO [fish oil]) become available in the United States, based on expert opinion, we suggest that their use be considered in the critically ill patient who is an appropriate candidate for PN.”<sup>9</sup> Moreover, after assessing the evidence base, the European Society for

Parenteral and Enteral Nutrition (ESPEN) recommends fish-oil use in many ICU, surgical, and cancer patients in 2009 and 2017 guidelines.<sup>10–14</sup>

When making an assessment, the choice of (1) what to include and (2) how to process these data are 2 key variables:<sup>15</sup> (1) Abbasoglu et al used broad inclusion criteria (34 studies were included), only excluding studies not in English, of children, or if only enteral nutrition (EN) was used. However, a large number of RCTs were excluded by Abbasoglu et al for reasons that are not clear, but instead they include retrospective/observational studies, which constitute a lower level of evidence. Moreover, many of the studies included “off-label” use of fish oil as the only lipid source. (2) Abbasoglu et al performed a nonsystematic narrative review, considered to be a fairly weak level of evidence within the evidence-based medicine hierarchy, whereas meta-analyses are among the most powerful methods available. Given the weight of evidence from meta-analyses and international guidelines, are the contradictory conclusions from Abbasoglu et al appropriate? Also, the reason given for not doing a meta-analysis was “the low quality of most studies and the substantial heterogeneity,” but they then used data from these same “low-quality” studies to reach their conclusions.

In conclusion, we agree with Abbasoglu et al that further large-scale RCTs are needed, but we disagree that there is little benefit to using fish oil. The weight of evidence, supported by international guidelines, indicates clinical benefits for using fish oil–enriched PN in adult patients.

The ESPEN Expert Group\*

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