

Evaluating the appropriateness of indication and formulation of total parenteral nutrition (TPN) at an acute care hospital

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Background

- TPN provides a way of feeding patients intravenously when an enteral route is otherwise unavailable
- Given the potential risks of parenteral nutrition, like increased risk of thrombosis and infection, it is essential to ensure appropriate indication prior to initiating TPN
- Patients started on TPN should ideally be titrated to their goal macronutrients by day 3 of TPN
- At this institution, pharmacists may order TPN under the newly established pharmacist-driven TPN process utilizing premix or custom TPNs

Objective

The goal of this medication use evaluation (MUE) is to assess appropriateness of TPN initiation based on indication, utilization of premix versus custom TPN, and possible areas for improvement in a newly implemented pharmacist-driven TPN process.

Methods

Single-center
Retrospective
Chart Review
MUE

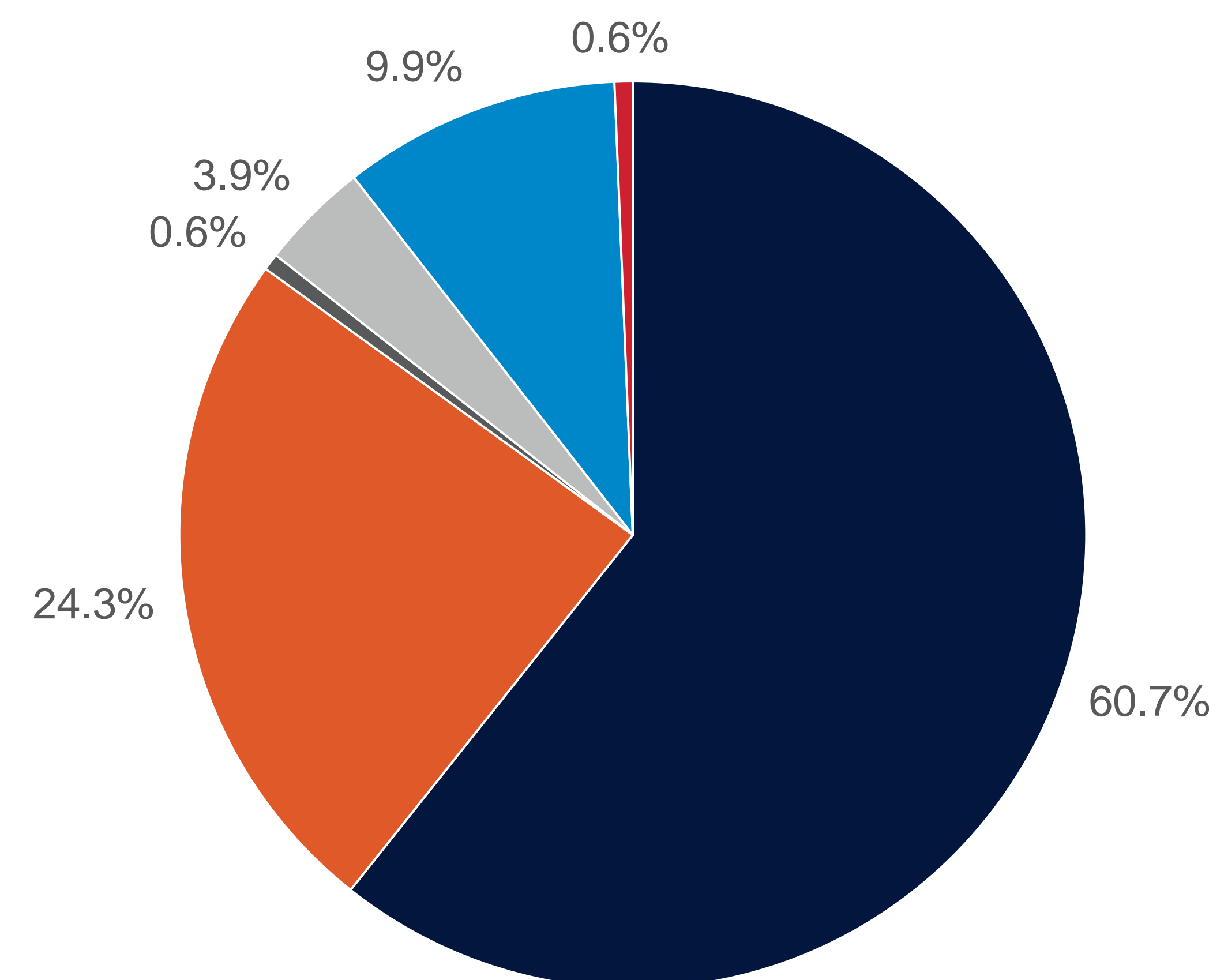
Study Period:
October 1st to
December 31st 2021

Inclusion Criteria:
• ≥18 years of age
• Received TPN
under the
pharmacist-driven
TPN process

- Patients identified utilizing a clinical support software generated list
- Data points collected: indication, premix versus custom TPN, reason for use of custom TPN, titration to dietician recommended goal macronutrients by day 3 of TPN, reason for delay of titration to goal macronutrients
- Appropriate indications include:
 - Non-functional gastrointestinal tract, ileus, hyperemesis
 - No enteric nutrition for 10 days or 5 days if post-operative
 - Inability to establish enteric access or tolerate enteric feeds
 - Unable to reach enteral nutrition goals by day 7
 - Anticipated need for parenteral nutrition > 7 days with no pre-existing malnutrition or > 5 days with pre-existing malnutrition
 - On active chemotherapy unable to absorb nutrients for > 7 days
- Appropriate reasons for use of custom TPN include:
 - Unable to advance macronutrients to goal with available premix TPN
 - More than a total of 5 additives in TPN
 - Fluid adjustments (hypo/hypernatremia, fluid restriction)
 - Electrolyte imbalances
 - Premix TPN/additive/electrolyte shortages

Results

Figure 1. TPN Indications

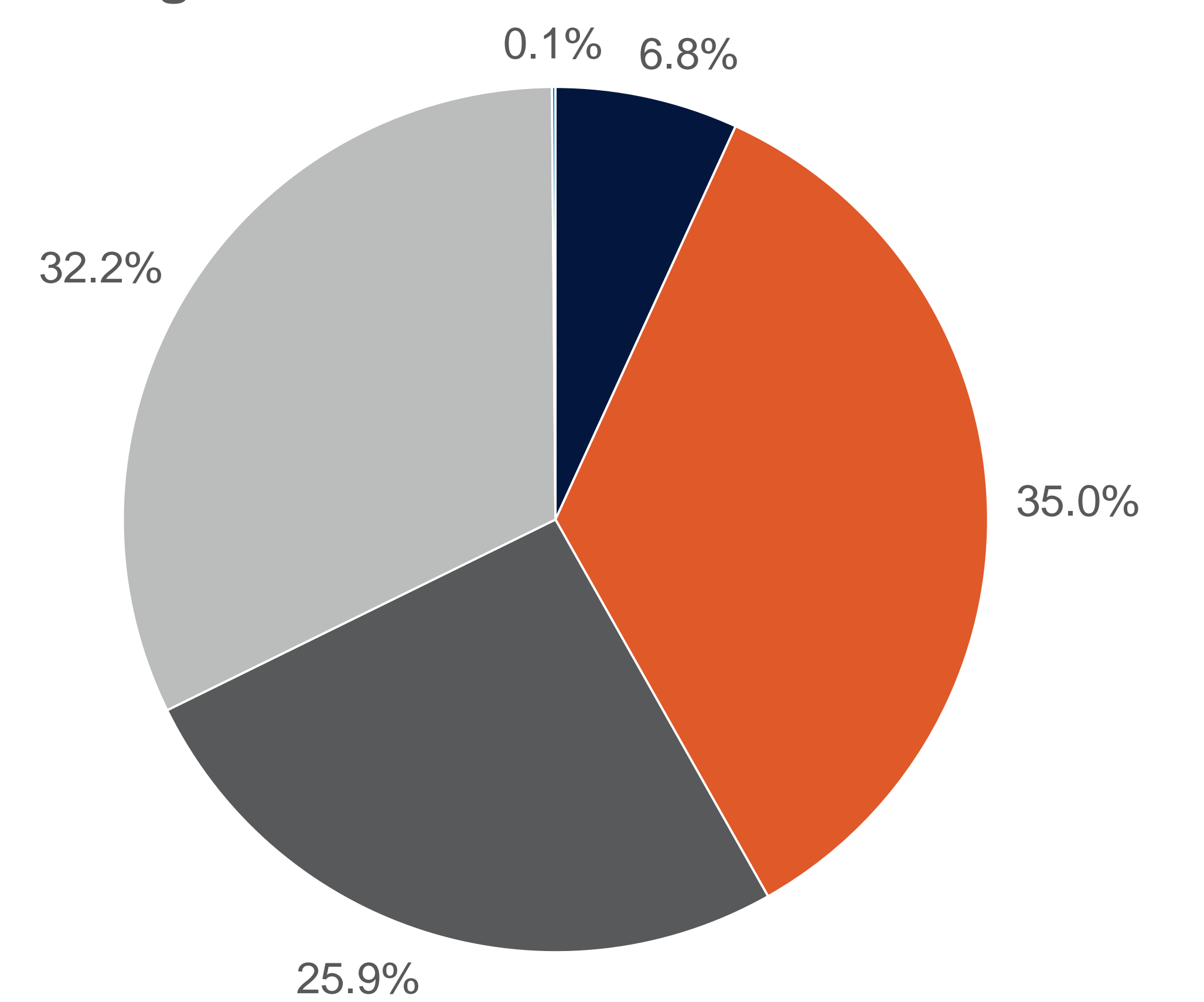


- Have a non-functional GI tract, ileus, hyperemesis
- Inability to establish enteric access or tolerate enteric feeds
- No enteric nutrition for 10 days or 5 days if post-operative
- On active chemotherapy and unable to absorb nutrients for > 7 days
- Other (Inappropriate Indications)
- Unknown

Table 1. Utilization of Premix vs. Custom TPN

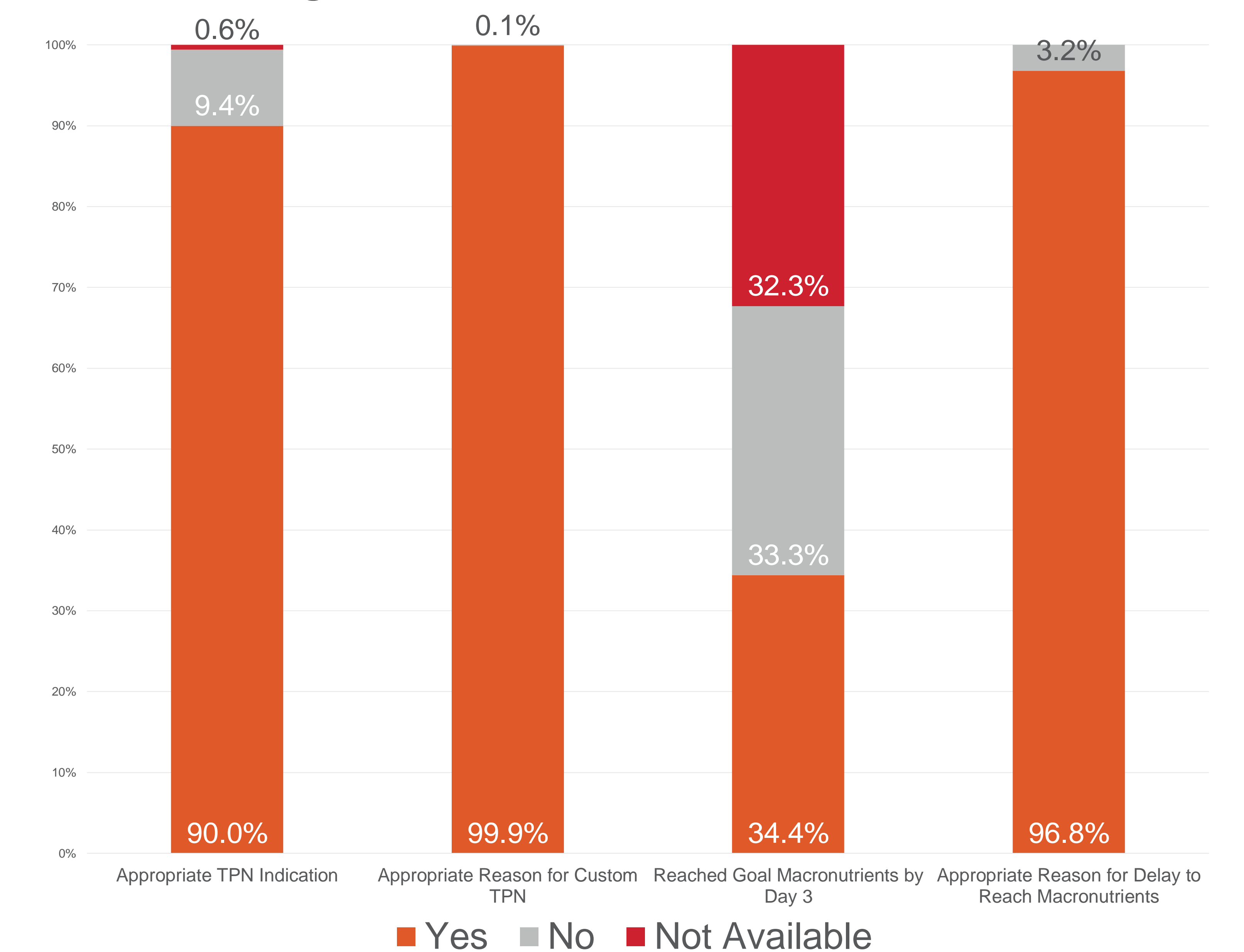
	Number of TPN Orders	Percentage
Premix TPN	158	17.0
Custom TPN	771	83.0

Figure 2. Reason for Custom TPN



- Premix TPN/additive/electrolyte shortages
- Electrolyte imbalances
- Fluid adjustments
- Unable to advance macronutrients to goal with available clinimix
- Unknown

Figure 3. Additional Outcomes Evaluated



Discussion

- There were a total of 93 patients with 929 TPN orders analyzed
- It was found that 49.2% of patients were not titrated to goal macronutrients by day 3, with 96.8% of those patients having an appropriate reason for the delay. 32.3% of patients were on TPN for less than 3 days
- Appropriate reasons for not advancing to goal by day 3 of TPN include: electrolyte and other laboratory abnormalities associated with concerns of refeeding syndrome, titrating down due to start of enteral nutrition, and issues with obtaining central access
- Premix TPNs have a fixed total volume and amount of electrolytes thus the use of custom TPNs in patients with electrolyte abnormalities and fluid imbalances were necessary

Conclusion

- Most TPN orders analyzed under the newly implemented pharmacist-driven TPN process were found to be appropriate based on indication and were appropriately titrated to goal macronutrients
- Although most of the TPNs initiated within the study period had appropriate indications, areas for improvement could include the addition of an indication screen when "Pharmacy to dose TPN" consults are ordered
- The use of custom versus premix TPNs were more than expected given drug shortages during this time frame; it is anticipated that as drug shortages resolve, the use of premix TPNs will increase.

References

1. Boullata JI, Gilbert K, Sacks G, et al., A.S.P.E.N. clinical guidelines: parenteral nutrition ordering, order review, compounding, labeling, and dispensing. JPEN J Parenter Enteral Nutr. 2014;38(3):334-377.

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