

Health Economic Benefits of Real Food Tube Feeding Formulas Compared to Standard Tube Feeding Formulas in Post-Acute Adult Patients

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BACKGROUND

- Enteral nutrition (EN) is crucial for the treatment of individuals with functional gastrointestinal tracts who are unable to consume adequate nutrients orally.¹⁻³
- EN is often initiated during acute care in hospital but may be continued as part of post-acute care.⁴
- The prevalence of home enteral nutrition (HEN) as part of post-acute care in the US has increased in recent decades due to its clinical and economic benefits.⁵
- Healthcare professionals, patients, and caregivers are requesting tube feeding formulas including more real food and recognizable ingredients.^{1,6}
- Intolerance of tube feeding formulas can be a challenge in patients receiving HEN, potentially leading to increased healthcare resource utilization (HCRU) and associated costs.^{7,8}
- Commercially blenderized tube feeding formulas (CBTF) containing a variety of real foods are suitable, and often preferred, for patients who have difficulty tolerating standard tube feeding formulas (STD-TF) which might be plant based but do not contain real food.¹

OBJECTIVE

- The study objective was to conduct HCRU and cost analysis of CBTF compared with STD-TF in post-acute care.

METHODS

- This was a retrospective observational study, conducted using data from the Decision Resources Group Real World Evidence Data Repository. This repository covers 98% of US health plans and includes medical and pharmacy claims.⁹
- Patients ≥14 years of age, with a prescription of either CBTF (Compleat® Organic Blends, Nestlé HealthCare Nutrition, US) or STD-TF (Kate Farms® Standard 1.0 and 1.4, Kate Farms Inc., US) between Jan 2018 and Dec 2020 were included.
- The index date was defined as the date of hospital discharge. Outcomes were compared at 84 days post-index between the two groups.
- HCRU and associated costs were compared using descriptive statistics (median, mean, and standard deviations) and the appropriate univariate statistical test (chi-square, t-test, or non-parametric test) at the alpha=0.05 level of significance to compare the CBTF and STD-TF groups.
- Adjusted costs were calculated using a multivariate generalized linear model adjusted for age, gender, and Charlson comorbidity index (CCI) score.

RESULTS

PATIENT CHARACTERISTICS

- The study included 124 patients in the CBTF group (52% female, mean [standard deviation (SD)] age at index date 41.8 [23.9] years), and 324 in the STD-TF group (44% female, mean [SD] age at index date 41.5 [23.1] years). There were no statistically significant differences between the two groups regarding mean age, gender, most common comorbidities and CCI score (**Table 1**).
- The most common diagnoses in the year preceding the index date were diseases of the digestive system (CBTF 89%, STD-TF 91%), musculoskeletal system and connective tissue (CBTF 74%, STD-TF 83%), and nervous system (CBTF 79%, STD-TF 78%).
- Eighty-seven percent of patients in the CBTF group had at least one CCI comorbidity compared with 83% of those in the STD-TF group. Of these, 59% in the CBTF group had CCI scores of 1–2 compared with 53% in the STD-TF group; 19% in the CBTF group had CCI scores of 3–4 compared with 16% in the STD-TF group; 22% of patients in the CBTF group had CCI scores ≥5 compared with 32% in the STD-TF group.

	CBTF (N=124)	STD-TF (N=324)	p-value
Mean age, years (SD) [†]	41.8 (23.9)	41.5 (23.1)	0.882
Gender, n (%)			
Female	64 (52)	143 (44)	0.156
Most common Charlson comorbidities, n (%) [‡]			
Chronic pulmonary disease	43 (35)	128 (40)	0.347
Paraplegia and hemiplegia	48 (39)	96 (30)	0.066
Cancer	33 (27)	88 (27)	0.907
Mean CCI score (SD) [†]	3.4 (3.3)	3.9 (3.5)	0.208

Abbreviations: CCI, Charlson comorbidity index; CBTF, commercial blenderized tube feeding formula; SD, standard deviation; STD-TF, standard tube feeding formula. [†] Calculated at hospital discharge. [‡] Assessed during the year prior to hospital discharge.

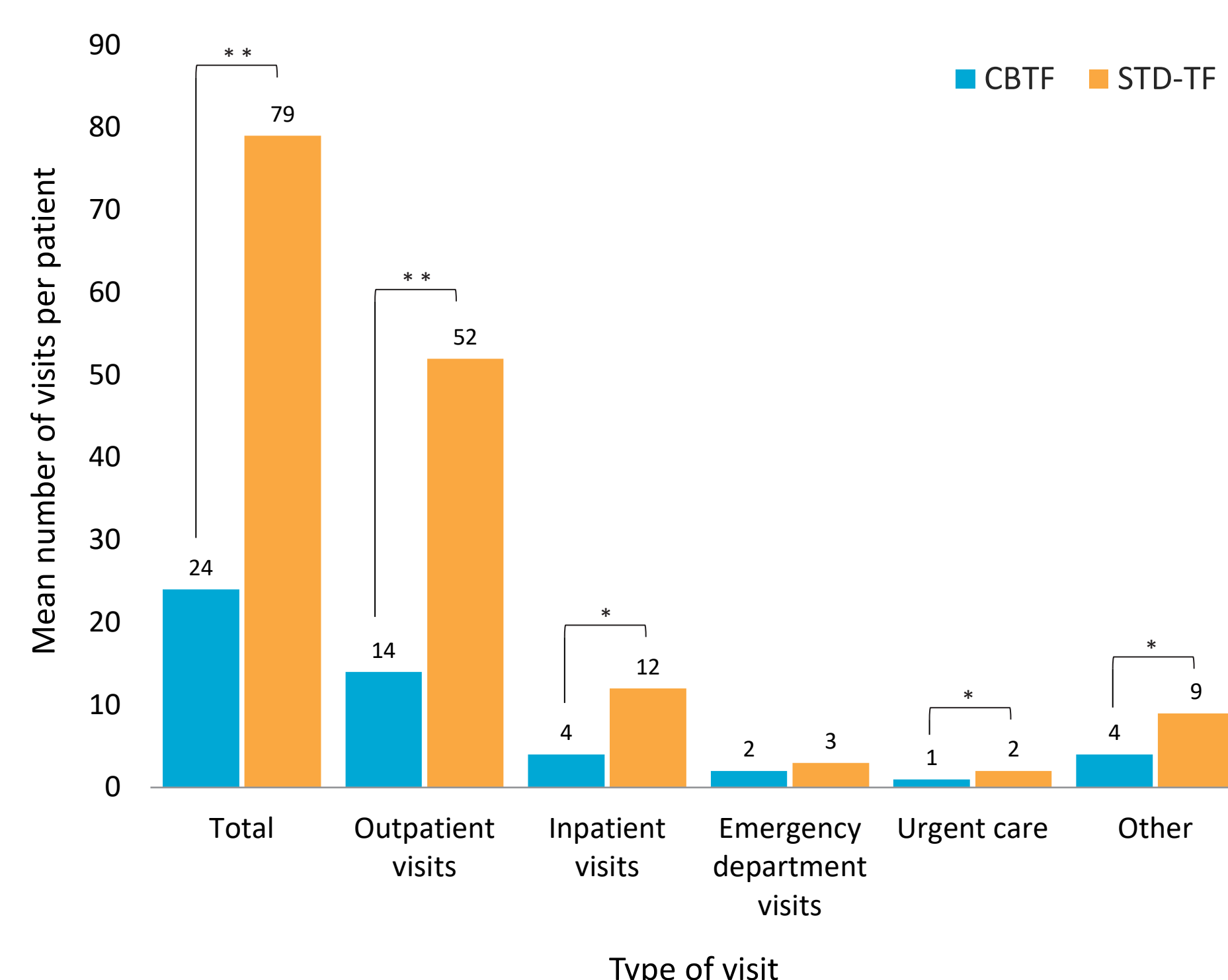


Commercial blenderized enteral formulas with **real food ingredients** are associated with **significant reductions** in **HCRU** and **economic burden** in post-acute care **adult patients** compared with standard tube feeding formulas

RESULTS

HCRU BY VISIT TYPE

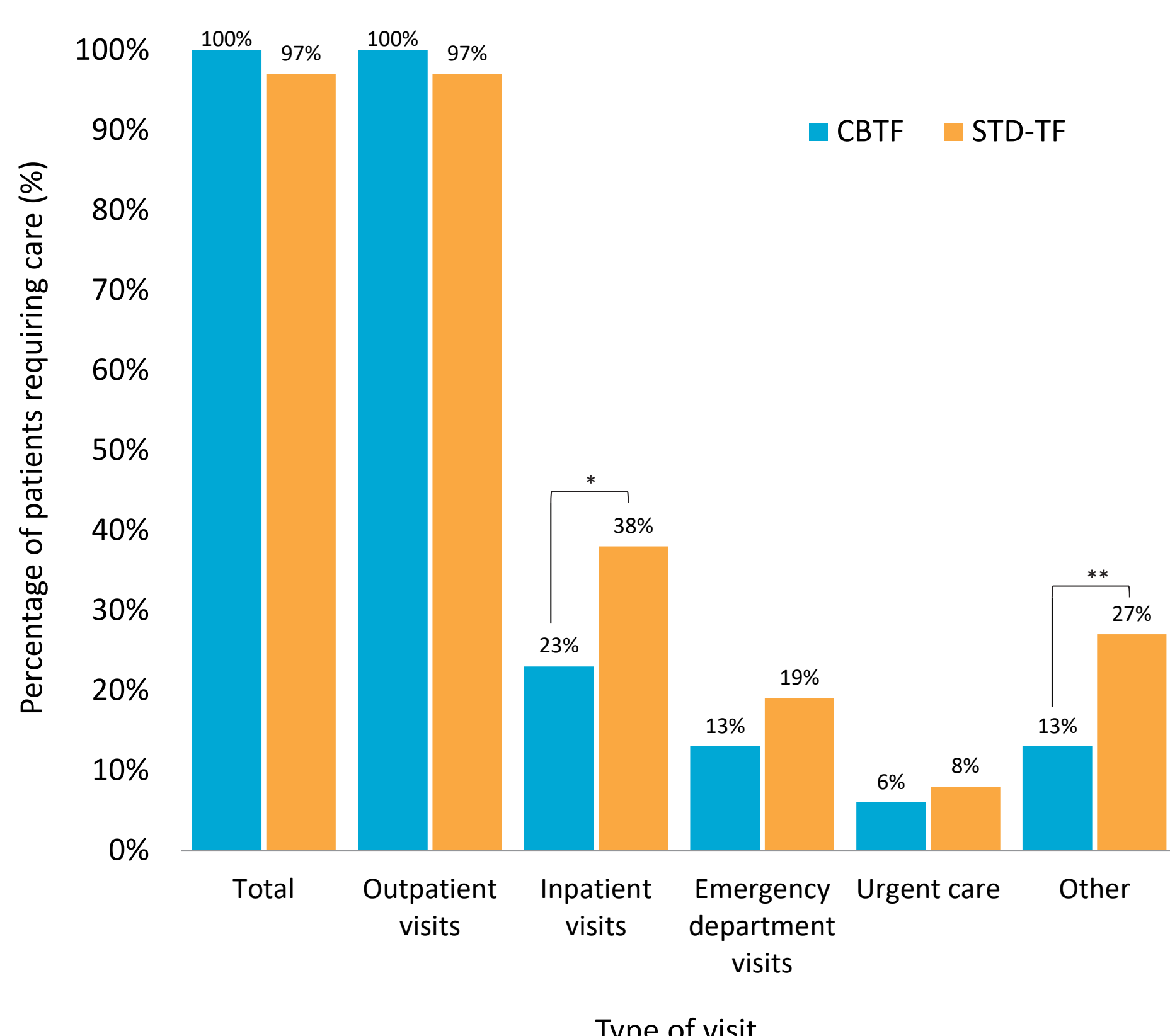
Figure 1: Mean number of visits to different places of service



Abbreviations: CBTF, commercial blenderized tube feeding formula; STD-TF, standard tube feeding formula. *p<0.05, **p<0.001.

- At 84 days post-index, the mean total number of visits (24 visits per CBTF patient vs 79 per STD-TF patient, p<0.001), visits to outpatient (14 vs 52, p<0.001), inpatient (4 vs 12, p=0.001), and other places of service, including assisted living, intermediate care, and unidentified facilities (4 vs 9, p=0.035), were significantly lower for the CBTF group compared with the STD-TF group (**Figure 1**).
- A significantly higher proportion of patients receiving STD-TF required inpatient visits (p=0.003) and visits to other places of care (p<0.001) than those receiving CBTF. The proportion of patients requiring any outpatient visits were comparable between groups (100% in the CBTF vs 97% in the STD-TF group) (**Figure 2**).

Figure 2: Percentage of patients requiring care by place of service

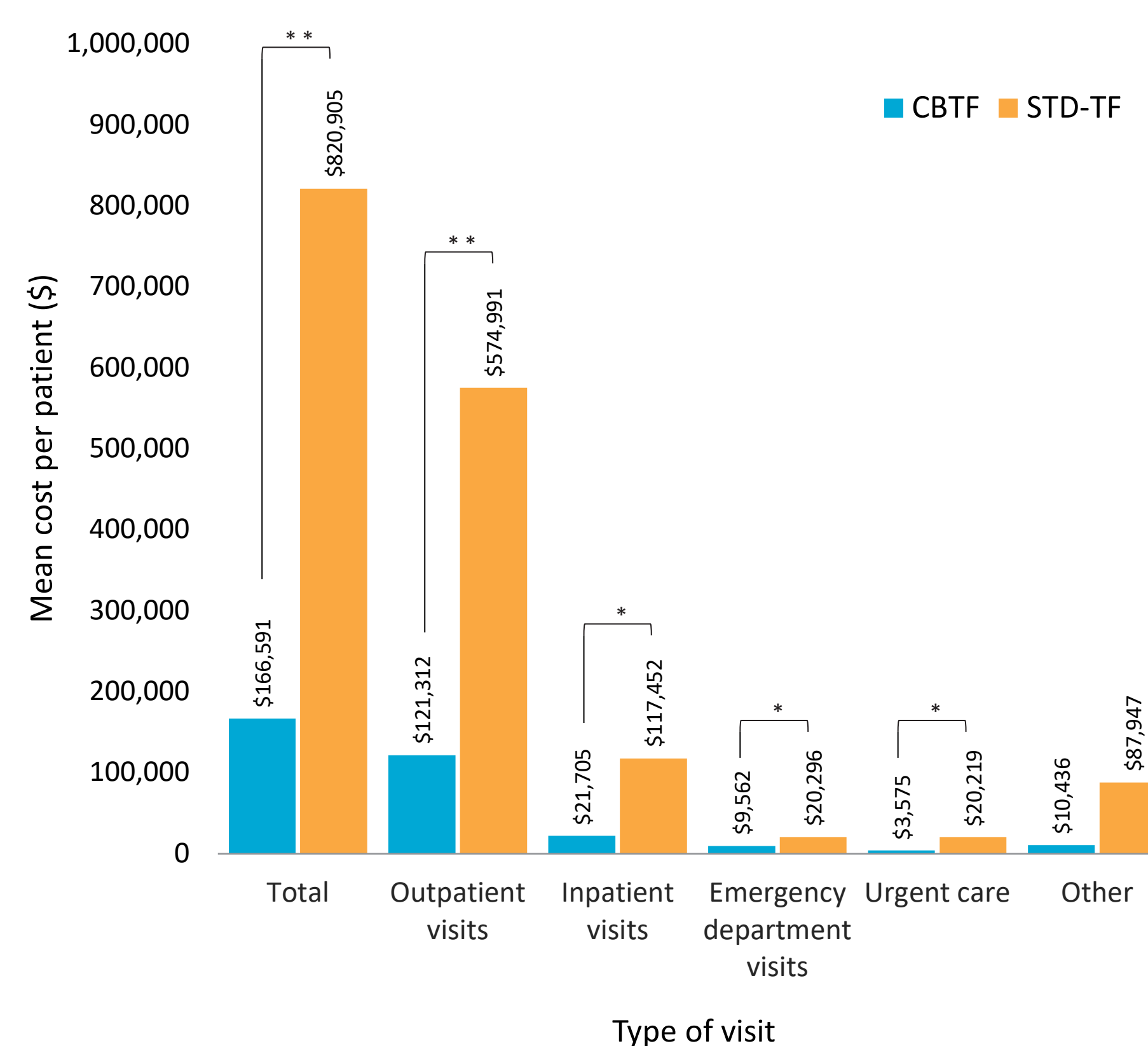


Abbreviations: CBTF, commercial blenderized tube feeding formula; STD-TF, standard tube feeding formula. *p<0.05, **p<0.001.

COST OF CARE BASED ON VISIT TYPES

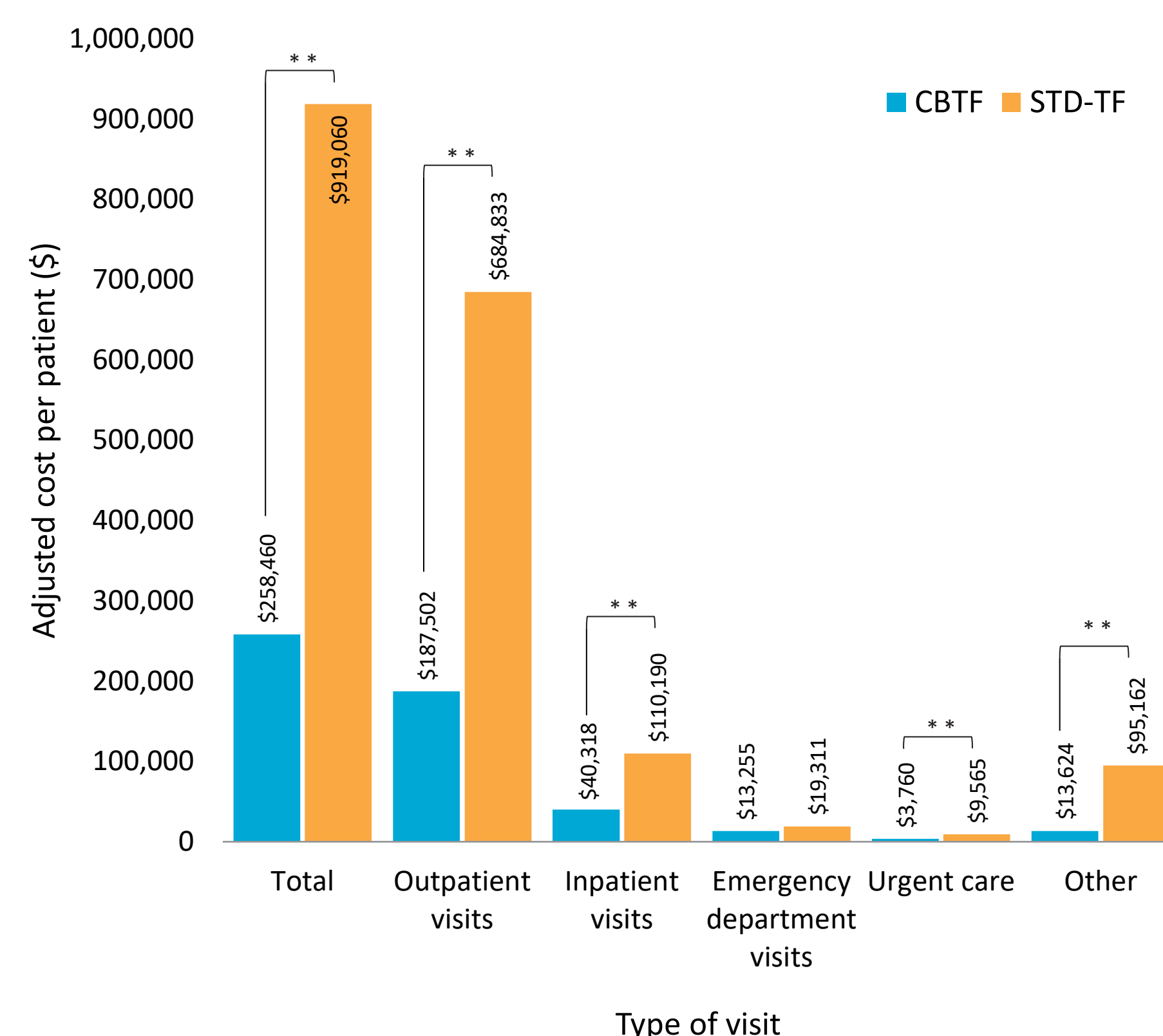
- Total unadjusted costs of healthcare visits were significantly lower in the CBTF group (\$166,591) compared with the STD-TF group (\$820,905, p<0.001) (**Figure 3**).
- After controlling for age, gender and CCI score, significantly lower adjusted costs attributed to inpatient visits (CBTF adjusted value [standard error (SE)] \$40,318 [8,040], STD-TF \$110,190 [7,259], p<0.001), outpatient visits (CBTF \$187,502 [13,979], STD-TF \$684,833 [23,843], p<0.001), urgent care (CBTF \$3,760 [638], STD-TF \$9,565 [972], p<0.001), and other visits (CBTF \$13,624 [3,212], STD-TF \$95,162 [6,791], p<0.001) were recorded for the CBTF group compared with the STD-TF group (**Figure 4**).

Figure 3: Unadjusted mean costs by place of service



Abbreviations: CBTF, commercial blenderized tube feeding formula; STD-TF, standard tube feeding formula. *p<0.05, **p<0.001.

Figure 4: Adjusted costs by place of service



Adjusted costs were calculated using a multivariate generalized linear model controlling for age, gender, and CCI score.

Abbreviations: CBTF, commercial blenderized tube feeding formula; STD-TF, standard tube feeding formula. **p<0.001.

CONCLUSION

- A CBTF containing a variety of real food prescribed in post-acute care was associated with fewer visits to healthcare providers and reductions in costs attributed to those visits compared with a plant-based STD-TF.
- Post-acute care patients prescribed a CBTF had lower inpatient, outpatient, urgent care, and other mean visits than those prescribed a plant-based STD-TF.
- Patients prescribed CBTF in post acute care had significantly lower costs associated with inpatient visits, outpatient visits, urgent care, and other services compared with those prescribed a STD-TF.

REFERENCES

1. Gramlich L, et al. *Nutrients*. 2018;10(8).
2. Carvalho-Salemi J, et al. *J Acad Nutr Diet*. 2018;118(1):40-51 e47.
3. Hendricks KM, et al. *Arch Pediatr Adolesc Med*. 1995;149(10):1118-1122.
4. Toole BJ, et al. *Congenit Heart Dis*. 2014;9(1):15-25.
5. Mundi MS, et al. *Nutr Clin Pract*. 2017;32(6):799-805.
6. Boullata JJ, et al. *JPEN J Parenter Enteral Nutr*. 2017;41(1):15-103.
7. Mundi MS, et al. *Nutr Clin Pract*. 2020;35(3):487-494.
8. Elfadil OM et al. *JPEN J Parenter Enteral Nutr*. 2021:1-9.
9. DRG. Decision Resources Group (DRG) Real World Evidence US Data Repository.

Presented at ESPEN Congress on Clinical Nutrition and Metabolism, September 3–6, 2022, Vienna, Austria. Sponsored by Nestlé Health Science. Unless otherwise noted, all trademarks are owned by Société des Produits Nestlé S.A., Vevey, Switzerland.

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