



Potential Cost Savings of Implementing a Standardized, Pharmacist-Led Protocol for Levothyroxine Administration in the Treatment of Chronic Hypothyroidism

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BACKGROUND

- Intravenous (IV) levothyroxine is commonly prescribed for the treatment of chronic hypothyroidism when hospitalized patients are NPO or cannot tolerate oral dosage forms
- IV levothyroxine poses several challenges for pharmacy staff—the product is intermittently on shortage, requires immediate use after reconstitution, and is very costly compared to the oral tablets
- Enteral administration of levothyroxine is recommended by ASPEN guidelines, but is often avoided due to absorption concerns and uncertainty regarding appropriate administration

OBJECTIVE

- To assess the potential cost savings of implementing a pharmacist-led protocol that aims to assure the appropriate use of various levothyroxine dosage forms

METHODS

- Retrospective application of proposed protocol to assess potential cost savings
- Inclusion Criteria:
 - Administration of IV levothyroxine from January 2021 – June 2021 at any NGMC location for the treatment of chronic hypothyroidism
 - Levothyroxine on home medication list
- Exclusion Criteria:
 - Elevated TSH within 1 month of IV levothyroxine administration
 - Myxedema coma or symptomatic hypothyroidism
 - Alternative thyroid medication on home medication list
 - New diagnosis of hypothyroidism
- This study represents a medication use evaluation which is considered non-research and is exempt from institutional review board approval

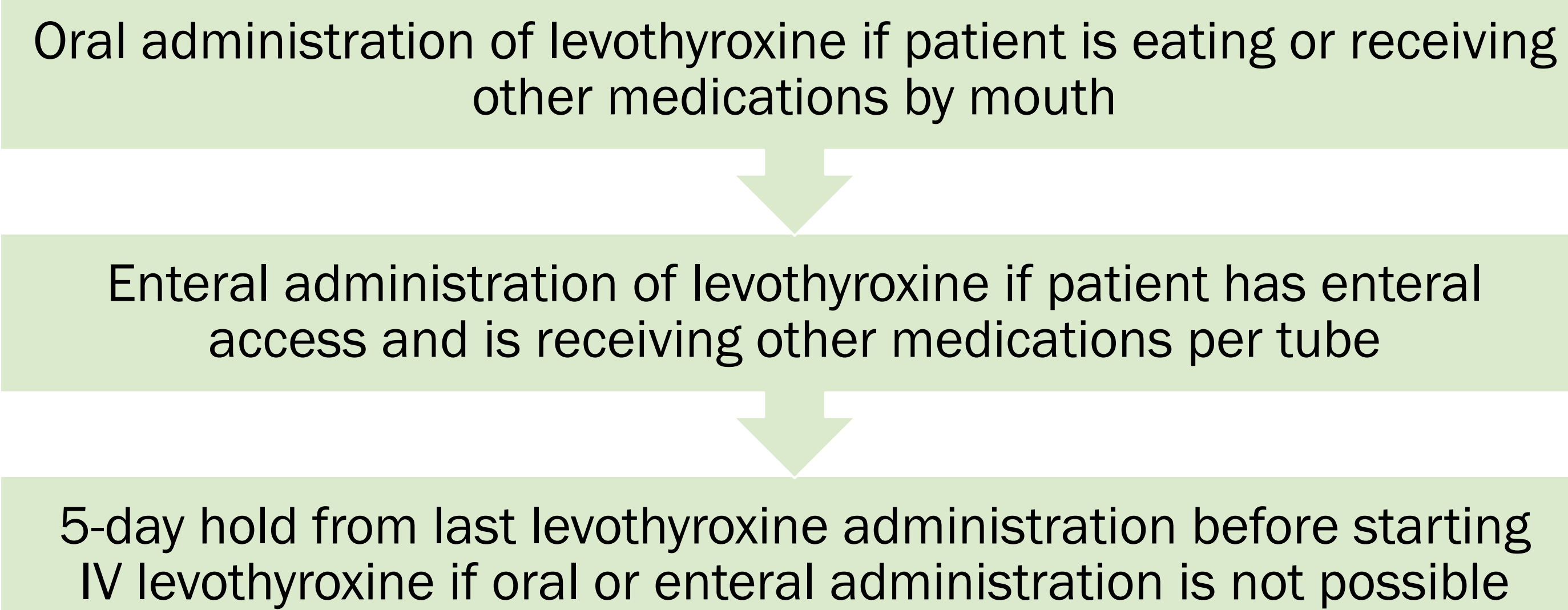
Primary Outcome

- Potential annual cost-savings of implementing proposed levothyroxine protocol

Secondary Outcomes

- Characterizing unnecessary IV levothyroxine use
- Quantifying the number of inappropriate doses avoided with protocol implementation

PROPOSED PROTOCOL



RESULTS

Figure 1. Included and Excluded Patients

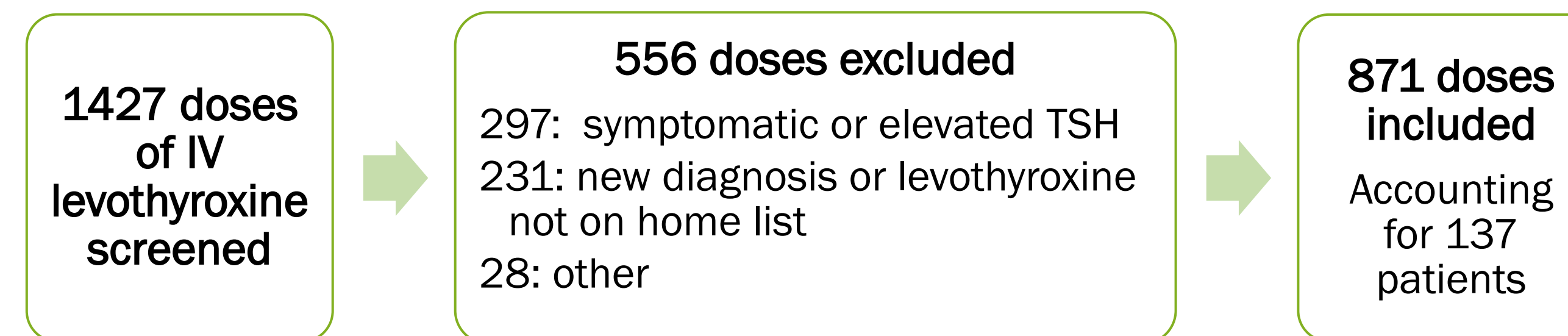


Table 1. Baseline Demographics

Demographic	n=137
Median age (years)	74
Sex	
Male	46 (34%)
Female	91 (66%)
Race	
White	122 (89%)
Black	5 (4%)
Other/Unknown	10 (7%)
Median TSH (μIU/mL)	1.8
Median Dosing	
IV dose (mcg)	50
Home dose (mcg)	88
IV:PO ratio	0.5
Average doses per patient	6.3
Median doses per patient	3

Figure 2. Institutional Costs



Injectable Levothyroxine
100 mcg/5mL single-use vial
\$66.12



Synthroid®
1 tablet (12.5-150mcg)
\$1.25

RESULTS (continued)

Figure 3. Retrospective Analysis of Administered Doses

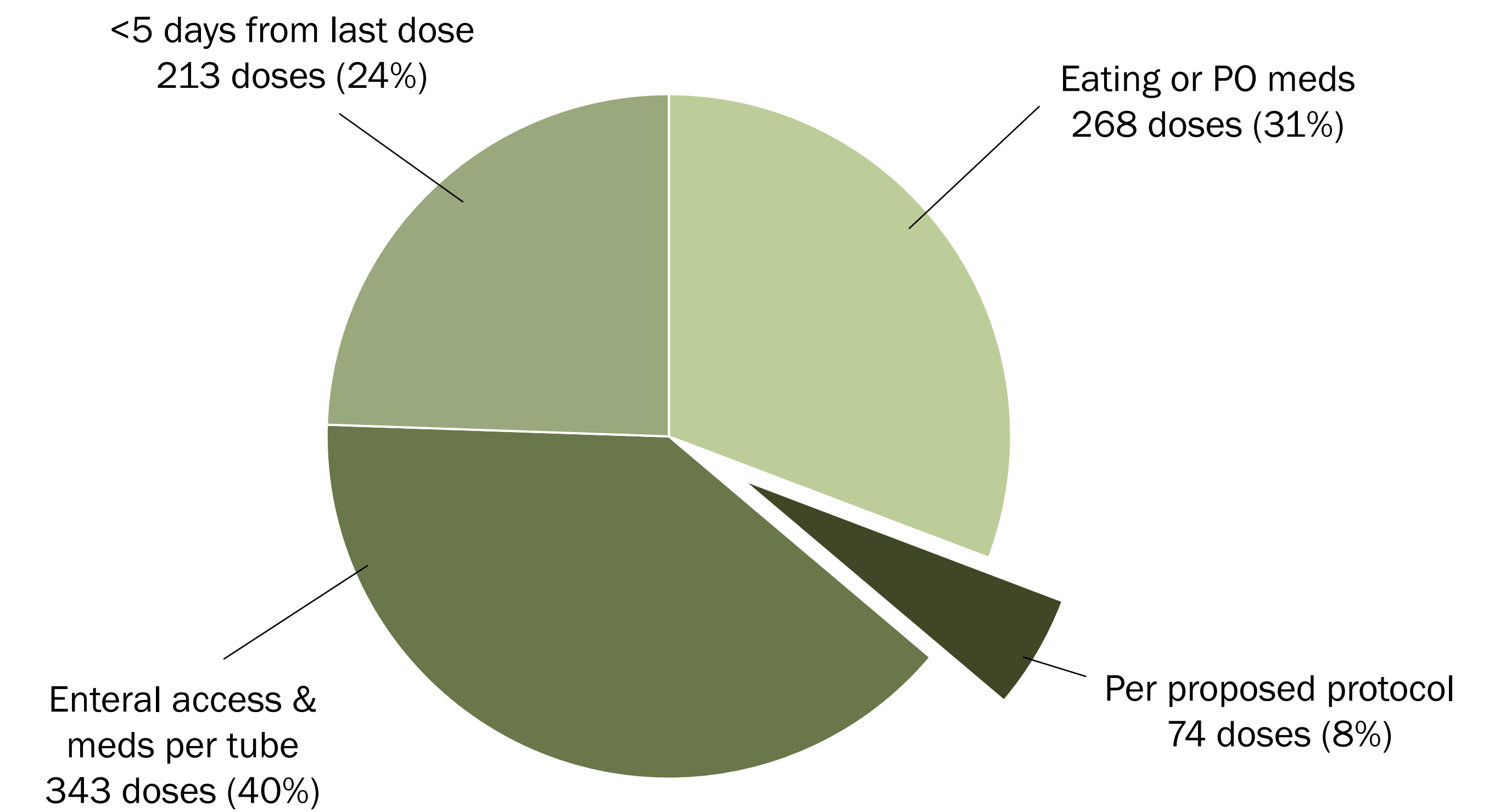


Table 2. Potential Cost-Savings

Number of unnecessary IV doses	Cost of unnecessary IV doses*	Cost of tablet if indicated	Cost Difference	Extrapolated Yearly Cost Savings
824	\$36,321.92	\$763.75	\$35,558.17	\$71,116.34

*Assumes 2 doses can be drawn from 1 vial 50% of the time

CONCLUSIONS

- The vast majority of intravenous levothyroxine doses administered to patients for the treatment of chronic hypothyroidism at NGMC are unnecessary
- A pharmacist-led levothyroxine administration protocol would benefit the health system by reducing inappropriate use of the intravenous product leading to significant cost avoidance
- Additional research is planned to assess actual cost savings, adherence to protocol, and incidence of adverse effects after the proposed protocol is approved by the institutional Pharmacy & Therapeutics committee and implemented across the health system

REFERENCES

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- 2) Barlow et al. Economic Evaluation of a Pharmacist-Led 5-Day Therapeutic Hold of IV Levothyroxine at an Academic Medical Center. Hospital Pharmacy. November 2020.
- 3) Marino et al. Intravenous levothyroxine stewardship program at a tertiary academic medical center. American Journal of Health-System Pharmacy. 2021;78(13)1200-1206
- 4) Garber et al. Clinical Practice Guidelines for Hypothyroidism in Adults. Endocr Pract. 2012;18(6):1003