

# A COST ANALYSIS OF PROPOFOL SEDATION FOR OUTPATIENT ENDOSCOPY IN THE ITALIAN HEALTHCARE SYSTEM

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## INTRODUCTION

The administration of propofol for sedation during outpatient endoscopy is traditionally performed by anesthesiologists, but recent studies have explored the safety and effectiveness of non-anesthesiologist administration of propofol (NAAP). Given the increasing demand for gastrointestinal (GI) endoscopies and the potential for healthcare cost savings, it is important to evaluate alternative sedation methods that maintain patient safety and satisfaction.

## OBJECTIVES

This study investigates the cost savings and safety of NAAP compared to anesthesiologist administration of propofol (AAP) for outpatient endoscopy within the Italian Healthcare Service (NHS), through a two-phase study. The first phase involves a preliminary analysis comparing the adverse event rates between NAAP and AAP using Target Controlled Infusion at San Raffaele Hospital, Milan, Italy. The second phase focuses on calculating potential cost savings (from the Italian NHS perspective) that could result from the broad implementation of NAAP.

## METHODS

Phase one involved a cohort study of low-risk patients (ASA scores 1 and 2) who underwent esophagogastroduodenoscopies (EGDs) and colonoscopies from May 2019 to November 2021. Propensity score matching was used to balance baseline characteristics between the NAAP and AAP groups, based on a range of potential confounding factors, including age, sex, body mass index, smoking status, ASA score, and comorbidities. Adverse events, including hypotension, hypoxia, agitation, and bradycardia, were monitored.

Phase two involved developing a three-year budget impact model (BIM) from the perspective of the Italian NHS, comparing cost and resource utilization between NAAP and AAP. The model estimated the per-treated-patient and the total costs and compared the costs of the two scenarios, estimating the incremental costs (incremental budget impact) over the triennium 2023-2025 and for each year. Costs were expressed in euros (€).

## RESULTS

The study included 2,721 EGDs and 2,748 colonoscopies. Post-matching, NAAP and AAP groups showed no significant difference in adverse events (EGD: NAAP 0.4% vs. AAP 1.0%, p=0.452; Colonoscopy: NAAP 3.5% vs. AAP 0.6%, p=0.249).

NAAP was associated lower propofol dosages and shorter healthcare professional time work.

The BIM projected savings for the NHS of €124,724,659 over three years with NAAP implementation (Table 1).

For the Italian NHS, the use of NAAP instead of AAP will be associated with savings of €28,510,374 in drug costs and a reduction in staff involvement corresponding to 2,223 working days over the triennium 2023-2025.

NAAP reduced the average cost per EGD and colonoscopy due to decreased preparation and monitoring times, as well as lower drug usage costs.

Table 1  
Budget impact results on overall costs (€) for low anaesthesiologist risk patients undergoing endoscopy in the triennium 2023-2025

	Hospital perspective (€)					Italian perspective (€)			
	Single procedure	2023	2024	2025	Triennium 2023-2025	2023	2024	2025	Triennium 2023-2025
<b>AAP (Scenario)</b>	196	738,728	740,451	741,829	2,221,008	108,635,142	108,530,301	108,327,325	325,492,767
	EDG	80,74	283,155	283,825	284,361	851,341	50,582,053	50,533,237	50,438,729
<b>NAAP (Scenario)</b>	Colonoscopy	115,16	455,573	456,626	457,468	1,369,667	58,053,089	57,997,064	57,888,596
	EDG	121	455,462	456,524	457,374	1,369,359	67,007,547	66,942,880	66,817,681
<b>Savings</b>	Colonoscopy	49,94	175,140	175,554	175,885	526,579	31,286,447	31,256,253	31,197,797
	EDG	70,86	280,322	280,970	281,488	842,780	35,721,100	35,686,627	35,619,885
		75	283,266	283,927	284,455	851,649	41,627,595	41,587,421	41,509,643
		EDG	30,80	108,016	108,271	108,476	324,762	19,295,606	19,276,984
		Colonoscopy	44,30	175,251	175,656	175,980	526,886	22,331,989	22,310,437
									22,268,711
									66,911,137

## CONCLUSIONS

- NAAP is a safe, effective, and economically beneficial alternative to AAP for outpatient GI endoscopy.
- Implementing NAAP could result in substantial cost savings for the Italian NHS while maintaining high levels of patient safety.
- Future policies should support the adoption of NAAP, addressing training and regulatory challenges.

## CONTACT INFORMATION

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