

Proton pump inhibitor prescribing at hospital discharge: a real-world analysis from two Italian internal medicine units

Paola Gnerre,¹ Marco Pellicchio,¹ Andrea Ceccardi,¹ Elisa Schiavetta,¹ Martina Penso,¹ Alberto Gandolfo,¹ Lara Rebella,¹ Alessandra Brescia,² Amatore Morando,³ Martina Bagnasco,⁴ Alessandro Cavaliere,⁴ Monica Cirone,⁵ Bruna Rebagliati,⁶ Elena Farulla,² Michele Orlando⁷

¹Department of Internal Medicine, Local Health Authority ASL2 Liguria, Savona; ²Pharmacy Department, Local Health Authority ASL2 Liguria, Savona; ³Social and Health District, ASL2 Liguria, Savona; ⁴Department of Information and Communication Technology, ASL2 Liguria, Savona; ⁵Social and Health Care Services, ASL2 Liguria, Savona; ⁶Medical Directorate, ASL2 Liguria, Savona; ⁷Healthcare Management, Local Health Authority ASL2 Liguria, Savona, Italy

Key words: prescribing appropriateness; medication reconciliation; polypharmacy; drug utilization; older adults.

Correspondence to: Paola Gnerre, Department of Internal Medicine, San Paolo Hospital, ASL2 Liguria, Savona, Italy.
Tel.: +39 019 840 4978. E-mail: pgnerre@yahoo.it

Dear Editor,

Proton pump inhibitors (PPIs) are highly effective for acid-related disorders and for gastrointestinal protection in selected high-risk patients. However, treatment initiated or continued during an acute-care episode may persist without periodic reassessment, adding to polypharmacy, avoidable expenditure, and potential adverse effects.¹⁻⁵ Hospital discharge is therefore a clinically relevant transition at which the indication, dose, duration, and reimbursement eligibility of PPI therapy should be explicitly reviewed.⁶

We performed a retrospective descriptive analysis of all discharges from two Internal Medicine Units of Local Health Authority ASL2 Liguria, Italy, between 1 January 2024 and 30 June 2026. A PPI prescription at discharge was defined as the presence of at least one PPI—omeprazole, lansoprazole, pantoprazole, or rabeprazole—in the electronic medication list issued at discharge; each discharge constituted one observation. The primary outcome was the proportion of discharges including a PPI. Secondary descriptive outcomes were the temporal pattern across 2024, 2025, and the first semester of 2026 and the distribution of individual agents. Categorical data were summarized as counts and percentages. No prespecified between-unit or temporal hypothesis was tested; consequently, no inferential comparisons or p-values were calculated.

Among 10,573 discharges, 4226 (40.0%) included at least one PPI. In Unit 1, the proportions were 39.1% in 2024, 36.8% in 2025, and 40.6% in the first semester of 2026; in Unit 2, they were 42.1%, 42.5%, and 35.8%, respectively. The period estimates therefore fluctuated between 35.8% and 42.5%, without an evident monotonic increase or decrease. Annual denominators for each unit-period were unavailable in the aggregate extraction, preventing presentation of unit-period counts and formal temporal comparisons. Pantoprazole accounted for 3,656 prescriptions (86.5%); lansoprazole, omeprazole, and rabeprazole accounted for 9.6%, 2.1%, and 2.0%, respectively, with the small discrepancy from 100% attributable to rounding.

These findings describe frequent PPI inclusion in discharge medication lists, but they do not demonstrate overprescribing. The database did not contain pre-admission treatment, patient-level indications, dose, intended duration, contraindications to deprescribing, post-discharge dispensing, or documentation of eligibility for National Health Service reimbursement. Therefore, we could not distinguish new prescriptions from continuation of, or reversion to, previous therapy, quantify prescribing inertia, determine appropriateness, or estimate expenditure attributable to the studied prescriptions. The potential clinical and economic benefits of deprescribing remain theoretical in relation to this dataset.

The predominance of pantoprazole should likewise not be interpreted as discretionary preference or inappropriate molecule selection. It may reflect hospital-pharmacy availability, local formulary policy, or continuation of the agent administered during hospitalization, whereas other PPIs may represent reversion to pre-admission treatment. Medication stewardship should therefore focus on confirming and documenting the indication, intended duration, dose, and reimbursement eligibility rather than merely switching between agents. Regular review is consistent with current expert guidance, which recommends considering deprescribing when no definitive long-term indication exists while maintaining therapy in patients with complicated gastroesophageal reflux disease, Barrett's esophagus, eosinophilic esophagitis, or high risk of upper gastrointestinal bleeding.^{7,8}

The Italian regulatory framework has also changed. Italian Medicines Agency Note N01, effective from 22 March 2026, unified and replaced former Notes 1 and 48 and now defines the conditions for PPI reimbursement by the National Health Service.⁹ Most observations in our study preceded its implementation, and reimbursement documentation was not captured; adherence to the new Note and its effect on prescribing patterns could therefore not be evaluated. Contextually, the 2024 National Observatory on Medicines report documented PPI consumption and expenditure in Liguria above the national average.¹⁰ These ecological figures

were not linked to the discharge prescriptions and cannot be causally attributed to them.

The clinical value of medication review at discharge extends beyond PPIs. Recent evidence has highlighted the need to assess prescribing appropriateness in commonly used drug classes, particularly in older patients, and the importance of structured continuity after hospitalization.^{11,12} These principles are directly relevant to internal medicine, where multimorbidity and polypharmacy are common. They support prospective studies linking pre-admission therapy, documented indication, Note N01 eligibility, discharge treatment, and subsequent community dispensing. Only patient-level linkage can establish whether treatment was initiated in hospital, persisted after discharge, or was appropriately deprescribed.

In conclusion, four out of ten discharge medication lists from the participating units included a PPI, most often pantoprazole. This finding identifies discharge as an opportunity for medication reconciliation, not as proof of inappropriate prescribing. A structured discharge record specifying indication, dose, intended duration, reimbursement eligibility, and a plan for reassessment may improve continuity and permit future evaluation of clinical and economic outcomes.

References

1. Scarpignato C, Gatta L, Zullo A, et al. Effective and safe proton pump inhibitor therapy in acid-related diseases: a position paper addressing benefits and potential harms of acid suppression. *BMC Med* 2016;14:179.
2. National Institute for Health and Care Excellence. Gastro-oesophageal reflux disease and dyspepsia in adults: investigation and management. NICE guideline CG184. London, UK: NICE; 2022.
3. Forgacs I, Loganayagam A. Overprescribing proton pump inhibitors. *BMJ* 2008;336:2-3.
4. Farrell B, Pottie K, Thompson W, et al. Deprescribing proton pump inhibitors: evidence-based clinical practice guideline. *Can Fam Physician* 2017;63:354-64.
5. Visconti M. Proton pump inhibitors overuse: only inappropriate prescriptions or further iatrogenic damage? *Ital J Med* 2015;9:217-28.
6. Bell CM, Brener SS, Gunraj N, et al. Association of ICU or hospital discharge with unintentional continuation of medications intended for acute illness. *JAMA* 2011;306:2525-33.
7. Targownik LE, Fisher DA, Saini SD. AGA clinical practice update on de-prescribing of proton pump inhibitors: expert review. *Gastroenterology* 2022;162:1334-42.
8. Wilsdon TD, Hendrix I, Thynne TR, Mangoni AA. Effectiveness of interventions to reduce chronic proton pump inhibitor use: a systematic review. *Br J Clin Pharmacol* 2017;83:662-75.
9. Agenzia Italiana del Farmaco. Nota AIFA N01: indicazioni per la prescrivibilità a carico del SSN degli inibitori di pompa protonica. Determina PRES n. 238/2026. Rome, Italy: AIFA; 2026.
10. Osservatorio Nazionale sull'Impiego dei Medicinali. L'uso dei farmaci in Italia. Rapporto nazionale anno 2024. Rome, Italy: Agenzia Italiana del Farmaco; 2025.
11. Almegren MO. Assessment and predictors of inappropriate dose of direct oral anticoagulants. *Ital J Med* 2024;18:1679.
12. Maiello M, Proce F, Caputo C, et al. Continuity of care in acute coronary syndrome: why dedicated clinics for post-acute coronary syndrome management make the difference. *Ital J Med* 2025;19:2054.

Received: 16 July 2026; Accepted: 6 August 2026; Early view: 23 September 2026.

Contributions: Paola Gnerre: concept and design of the study and draft of the manuscript. All authors: data collection, data interpretation, and critical revision of the manuscript. All authors read and approved the final version and agreed to be accountable for all aspects of the work.

Conflict of interest: the authors declare that they have no conflicts of interest related to this work.

Ethics approval and consent to participate: the study used exclusively retrospective, anonymized, and aggregated administrative data; no patient-level identifiable data were used. Ethics committee approval and consent to participate were therefore not required under applicable institutional regulations.

Informed consent: not applicable.

Patient consent for publication: not applicable; the manuscript contains no identifiable patient information.

Availability of data and materials: the institutional administrative data are not publicly available. Aggregated data may be made available by the corresponding author upon reasonable request and subject to authorization by ASL2 Liguria.

Declaration of generative artificial intelligence and artificial intelligence-assisted technologies in the writing process: during preparation of this Letter, the authors used ChatGPT (OpenAI) to assist with language editing and restructuring. The authors reviewed and edited the resulting text and take full responsibility for the content of the publication.

Publisher's note: all claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article or claim that may be made by its manufacturer is not guaranteed or endorsed by the publisher.

This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0).