



TITLE: Subcutaneous Administration of Proton Pump Inhibitors in Palliative Care Patients: A Review of Clinical Effectiveness and Guidelines

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CONTEXT AND POLICY ISSUES:

For patients in palliative care who can no longer swallow, administration of medications may be challenging. If drugs must be administered by injection, subcutaneous infusion is generally preferred to intramuscular or intravenous routes.¹ Many drugs however, are not approved for administration via subcutaneous injection.¹

According to Health Canada's Drug Product Database,² there are several oral formulations of proton pump inhibitors (PPIs) on the market in Canada. An injectable form of pantoprazole is available in Canada but is approved for intravenous administration only.³ Intravenous pantoprazole, esomeprazole, and lansoprazole are available in the US.⁴ This report was requested to determine if there is any evidence to support subcutaneous or other non-oral routes of administration for these drugs in palliative care patients.

RESEARCH QUESTIONS:

1. What is the clinical effectiveness and safety of subcutaneous administration of proton pump inhibitors in palliative care patients?
2. What are the guidelines for administration of proton pump inhibitors in palliative care patients?

METHODS:

A limited literature search was conducted on key health technology assessment resources, including OVID MedLine, OVID Embase, The Cochrane Library (Issue 1, 2009), University of York Centre for Reviews and Dissemination (CRD) databases, ECRI, EuroScan, international

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health technology agencies, and a focused Internet search. Results include articles published between 2004 and March 2009, and are limited to English language publications only. No filters were applied to limit the retrieval by study type for research question 1. Filters were applied to limit the retrieval to guidelines for research question 2. Reference lists of relevant articles were reviewed.

SUMMARY OF FINDINGS:

The search identified one report describing three cases where omeprazole was administered via subcutaneous infusion.⁵ No guidelines for administering PPIs via a non-oral route of administration in palliative care patients were found. Two articles outside of the date limits of the search, but which may be relevant, have been included in the appendix.

Observational studies

The letter by Agar *et al.*⁵ described three cases where the intravenous formulation of omeprazole was administered via subcutaneous infusion in palliative care patients with retrosternal pain. A solution of omeprazole 40 mg in 100 mL sodium chloride 0.9% was infused once daily over three to four hours via a subcutaneous line. Omeprazole was administered for two to four days in these three palliative patients. The infusion was well tolerated and resulted in resolution of retrosternal pain symptoms. The authors stated that although subcutaneous administration of omeprazole was successful in these cases, further prospective studies are required.

Limitations

No high quality evidence was identified on the subcutaneous administration of PPIs. One report of three cases was identified. Case reports are considered the weakest form of evidence and as such cannot be used to make a definitive statement regarding a drug's effectiveness or safety.

CONCLUSIONS AND IMPLICATIONS FOR DECISION OR POLICY MAKING:

There is evidence from three case reports published in one article describing the subcutaneous administration of omeprazole in palliative care patients. An injectable form of omeprazole is not, however, commercially available in Canada. No guidelines about the administration of PPIs in palliative care patients were identified. This lack of evidence perhaps should be considered when making a decision about the subcutaneous administration of PPIs in this patient population. Due to the lack of evidence, no conclusions can be drawn regarding the safety and efficacy of subcutaneous administration of PPIs.

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APPENDIX: Additional relevant articles

Zylicz Z, van Sorge AA, Yska JP. Rectal omeprazole in the treatment of reflux pain in esophageal cancer. *J Pain Symptom Manage* 1998;15(3):144-5. [PMID: 9564112](#)

Choi MS, Chung SJ, Shim CK. Rectal absorption of omeprazole from suppositories in humans. *J Pharmaceutical Sciences* 1996;85(8):893-894. [PMID: 8863285](#)