congratulated for their contribution. The topic has been controversial, as has some of the literature that was cited in the article. For example, the first major article on this topic, published in *JAMA* in 2004 by Laheij et al., contained fundamental methodological flaws, later acknowledged in a letter to the editor, and did not establish a causal relationship between acid-suppressive drugs and community-acquired pneumonia.

The current article, by Cohen et al., provides a useful review of the literature and excellent new data. The authors acknowledge substantial limitations of the study that were unavoidable because of the retrospective design. While those limitations were managed as well as possible, the authors might also have discussed one important possibility that was not emphasized in the article. The authors established an association between proton pump inhibitor (PPI) use and community-acquired pneumonia (CAP). While they did not go so far as to claim a causal relationship between PPI and CAP, that possibility is likely to be inferred by readers. However, when prescribed correctly, PPIs are used to treat reflux. The authors could have pointed out that the association between PPIs and CAP might be due to a causal relationship between reflux and CAP rather than treatment for reflux. Most of us who have assessed a large number of patients through 24-hour pH impedance testing are aware that PPIs rarely suppress acid completely, even when given in double or triple the recommended doses, and that PPIs treat acidity, not reflux. Laryngopharyngeal reflux (LPR) has been associated with aspiration. It is possible that in the patients taking PPI identified in the present study, the reflux itself (rather than the PPI) was causally related to the CAP and that if there had been a control group of patients with LPR in which PPI treatment had been withheld, that group might have had an even higher incidence of CAP.

If misinterpreted, research into LPR and its treatments can inadvertently result in inappropriate withholding of medication by physicians or reluctance among patients to take PPIs for reasons that might not have scientific merit. Since untreated or undertreated reflux may have serious consequences, including esophageal and laryngeal cancer, continued research should be encouraged to definitively establish the causal relationship of disease, treatment, and complications.

We appreciate the opportunity to respond to Dr Sataloff’s thoughtful comments regarding our article “Associations between Community-Acquired Pneumonia and Proton Pump Inhibitors in the Laryngeal/Voice-Disordered Population.” Dr Sataloff questioned the observed association between proton pump inhibitor (PPI) use and community-acquired pneumonia (CAP), suggesting that this association could be related to a relationship between reflux and CAP instead of PPI treatment and CAP. Given our observational study, including a control group of patients with laryngopharyngeal reflux without PPI was not possible. However, in all statistical models examining the relation between PPI use and CAP, we controlled for gastroesophageal reflux diagnostic code as a potential modifying factor. This analytic approach mitigated, although possibly not completely, the possible influence of reflux disease on the association observed between PPI treatment and CAP. Moreover, we specifically stated that our study demonstrated an association, not causality (as is typical of large-scale observational research).

We certainly agree with Dr Sataloff that in specific patients, there may be strong indications for PPI treatment and that withholding PPIs could expose patients to potentially harmful effects of reflux disease. From a public health standpoint, however, this risk needs to be weighed against the growing concern regarding overtreatment with PPIs. For example, general medical physicians often treat patients with dysphonia with PPIs without laryngeal visualization. The potential for inappropriate PPI treatment among the otolaryngology community has similarly been reported. Furthermore, a recent longitudinal population-based study reported an increased long-term risk of pneumonia among primary care patients aged ≥60 years receiving PPIs.

**Disclosures**

**Competing interests:** None.

**Sponsorships:** None.

**Funding source:** None.

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**References**


**Associations between Community-Acquired Pneumonia and Proton Pump Inhibitors in the Laryngeal/Voice-Disordered Population**

DOI: 10.1177/0194599819857603

No sponsorships or competing interests have been disclosed for this article.
treatment for at least 1 year, consistent with our findings. Balancing patient symptoms with the potential pneumonia risk associated with PPI treatment can be challenging, and we detailed our recommendations to reduce potential CAP in patients with laryngeal/voice disorders in the Discussion section. As expressed in the article, we agree that continued research examining potential links among PPI treatment, altered microbiome/microflora, reflux disease, and adverse outcomes in the laryngeal/voice-disordered population is warranted. Physicians treating the laryngeal/voice-disordered population need a thoughtful patient-centered approach to balance the indications, risks, and benefits of PPI treatment.

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Disclosures
Competing interests: Seth M. Cohen, Syneos Health—data monitoring advisory board; Zsquare—consultant; David A. Leiman, Ironwood Pharmaceuticals—site principal investigator in clinical trial of novel gastroesophageal reflux disease therapy.

Sponsorships: None.
Funding source: None. The funding source for the original manuscript was AAOHNS.

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