



# All Systems Go: Reconsidering Healthcare Costs in Inflammatory Bowel Disease

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Crohn's disease (CD) and ulcerative colitis (UC) are inflammatory bowel diseases (IBD) affecting both children and adults that all too frequently follow a progressive relapsing and remitting disease course. As a result, these diseases impart a huge financial burden, with most recent estimates being \$14.9 billion for UC and \$15.5 billion for CD in annual combined direct and indirect costs [1, 2]. Since these are lifelong diseases for most patients and patients are frequently diagnosed at a young age, the lifetime costs for this disease are staggering and unsustainable. Accordingly, efforts have been made to identify the drivers of healthcare costs for IBD patients.

In this issue of *Digestive Diseases and Sciences*, Cai et al. published “A Phenome-Wide Analysis of Healthcare cost associated with Inflammatory Bowel Disease” in which they take a novel approach to the issue of healthcare care costs by applying a technique termed phenome-wide analysis (PheWAS) that has historically been applied to studies of population genetics [3]. The authors created clusters of ICD-9 codes representing specific phenotypes after which they applied PheWAS methodology in order to determine the effects that disease and comorbidity-related parameters had on healthcare costs. As one would expect, diagnoses that imply permanent bowel damage that are likely to lead to an operation were significantly associated with increased healthcare costs. What is unique to this study is that pulmonary and cardiovascular diseases were also associated with increased healthcare costs. Psychological comorbidities were also identified, particularly in terms of increased emergency room utilization, similar to the findings of other studies.

This article raises two key questions: (1) what is the best approach to achieve optimal cost-effective and clinical

outcomes for IBD patients? and (2) should healthcare maintenance practices be adjusted to include monitoring pulmonary and cardiovascular comorbidities?

With regard to the first question, Cai et al. reported that only 24% and 12% of their patients were exposed to immunomodulators and anti-TNF therapy, respectively, which, aside from impairing the generalizability of their study, reflects a modest utilization of therapies that decrease healthcare costs. Clinical trials have shown that early combined immunosuppression can decrease the rates of IBD-related surgery compared with conventional therapy, presumably due to the development of permanent fibrotic bowel damage in those not treated aggressively [4]. Since in 2008 D'Haens et al. reported that early combined immunosuppression reduced the need for surgery, this is not a particularly novel approach [5]. Nevertheless, the low rates of immunosuppression and anti-TNF therapy in the study by Cai et al. suggest that the field has a long way to go toward optimally managing IBD patients.

A major limitation of the study is that it was not able to incorporate pharmacy costs into their analysis. Despite the supporting literature advocating early combined immunosuppression, pharmacy costs are proving to be a major driver of healthcare costs for IBD patients. Click et al. have shown a 7% increase in pharmacy costs for IBD patients, making it the leading driver of healthcare cost at 44% of total costs [6]. Similarly, a study by the Crohn's and Colitis Foundation found the costs of IBD care have risen significantly in the past 5 years, largely driven by pharmacy expenses [7], leading to studies asking if a non-pharmacologic approach might achieve superior clinical and cost-effective outcomes. Cost-effectiveness analysis of the LIR!C trial, which compared early ileocecal resection versus infliximab treatment, favored resection in terms of total direct healthcare cost, although overall societal costs were comparable [8]. There is some indication in ulcerative colitis that more medication is not necessarily better. A retrospective study and meta-analysis failed to show benefit from dose intensification

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in severe acute ulcerative colitis in either the short or long term, suggesting that patients are incurring additional costs at no additional benefit [9]. In the end, early surgery for select Crohn's disease and ulcerative colitis patients should be reconsidered in order to achieve superior outcomes and reduce healthcare cost. As gastroenterologists, we typically see surgery as a failure, but we are starting to realize that it may be the best option for certain IBD patients.

To address the second question, Cai et al. identified pulmonary and cardiovascular disease as driving factors for healthcare costs that have not typically been addressed by clinical guidelines for preventative care in IBD patients. Guidelines have largely focused on reducing the risk of infection through vaccination and addressing long -complications of steroid use such as osteoporosis [10]. The optimization of pulmonary and cardiovascular conditions is only partially addressed by healthcare guidelines in that they recommend smoking cessation. Fortunately, psychiatric co-morbidities, which contributed to increased healthcare costs, were addressed by health maintenance guidelines. In the end, Cai et al. supported screening IBD patients for pulmonary and cardiovascular conditions and working closely with primary care physicians in order to achieve optimal cost-effective and clinical outcomes for IBD patients.

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