



BACKGROUND

- Chemotherapy (CTX), a central component of treatment for gastrointestinal (GI) cancers can lead to severe symptoms, which contribute to increased healthcare utilization and higher mortality.
- Symptoms often co-occur and form distinct clusters, such as “nausea-vomiting” and “fatigue-insomnia”, which may have varying associations with clinical outcomes.
- Neurological and GI symptoms are two major clusters observed during CTX. This study aims to analyze the longitudinal associations of CTX induced neurological and GI symptoms with healthcare utilization and mortality.

METHODS

- We conducted a retrospective study of 973 GI cancer patients in the Mass General Brigham Health System from 2019 to 2024. The Patient-Reported Outcome version of the Common Terminology Criteria for Adverse Events was used to assess 12 CTX-related symptoms at initiation and at days 30, 60, and 90 post initiation.
- Primary outcomes were all-cause urgent care visits, emergency department (ED) visits, and death within one year of CTX.
- Neurological cluster was defined as the co-occurrence of fatigue, insomnia, paresthesia, or pain. GI cluster was defined as the co-occurrence of constipation, decreased appetite, diarrhea, nausea, or vomiting.
- Time-to-event analysis was used to predict each outcome based on changes in neurological and GI clusters over the first 90 days of CTX. We also examined whether findings varied by age group, comorbidity level, time since diagnosis, cancer stage, and type

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MAIN FINDINGS

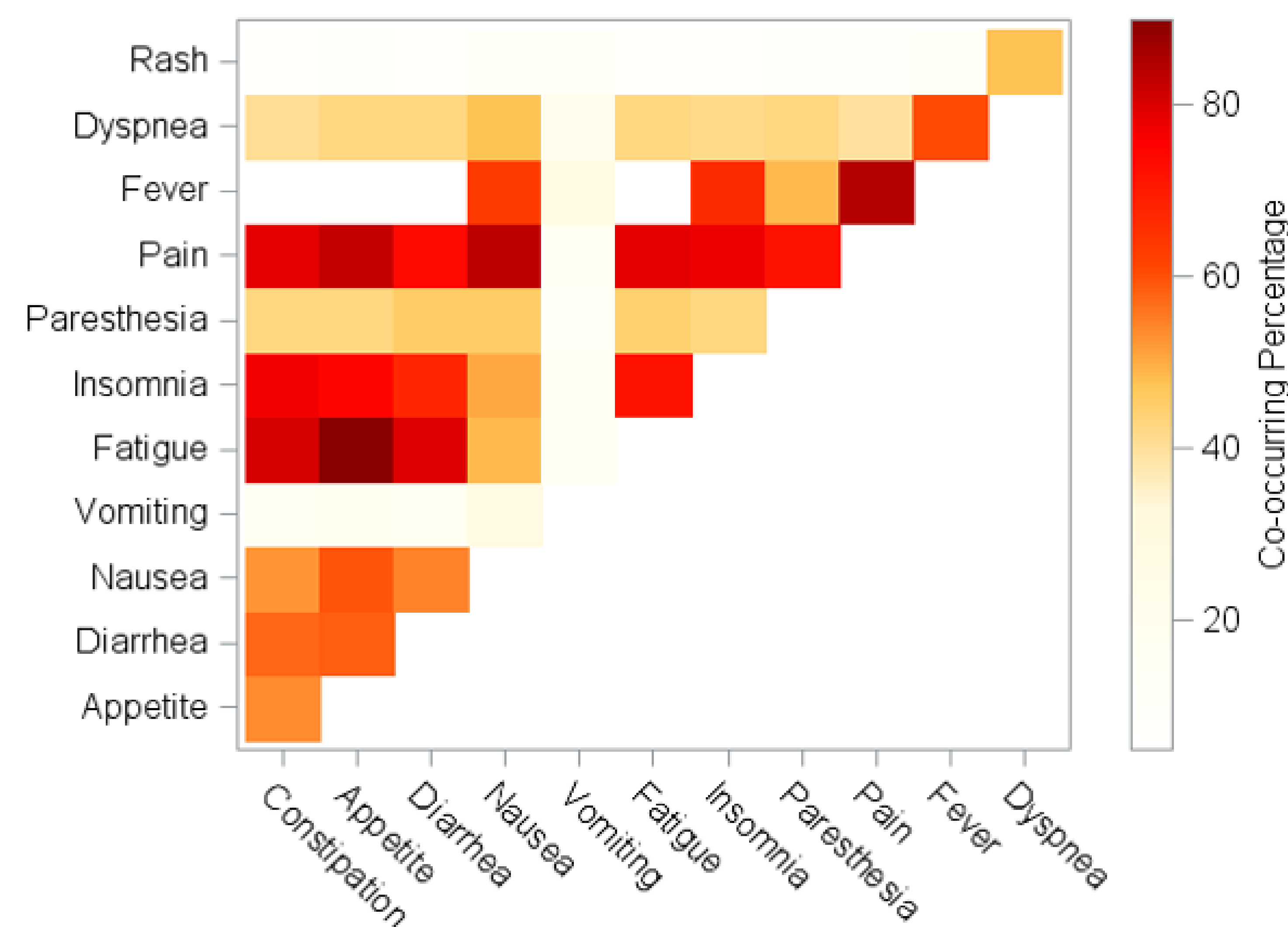


Figure 1. Co-occurring percentages among 12 symptoms in patients with gastrointestinal cancers at chemotherapy initiation (N = 783)

Table 1. Longitudinal associations of neurological (NEURO) and gastrointestinal (GI) symptom clusters and outcomes of interests

	Hazard Ratio		Incidence Ratio
	UC visit	ED visit	Admission
Neuro	1.27 (0.98 – 1.66)	1.00 (0.90 – 1.10)	1.01 (0.85 – 1.21)
GI	0.98 (0.80 – 1.19)	1.10 (1.02 – 1.19)	1.08 (0.94 – 1.24)

Note: UC: Urgent care; ED: Emergency department. we adjusted for age, race, cancer sites, cancer stages, fever, dyspnea, concurrent target therapy, concurrent immunotherapy, concurrent radiation therapy, duration after diagnosis, and comorbidities

RESULTS

- The most prevalent symptoms were fatigue(72.8%), pain(67.9%), and insomnia(61.1%)(Figure 1). The most common GI symptoms were decreased appetite(54.7%), diarrhea(50.1%), and constipation (41.5%). More than 75% of patients reported at least two neurological symptoms. Among patients with fatigue, 78.8% experienced pain, and 72.3% reported insomnia, making “fatigue-insomnia-pain” the most common combination.
- Higher neurological burden was associated with an increased risk of urgent care, but not ED visits or death, with stronger associations among older adults and those without comorbidities. In contrast, higher GI burden was associated with greater risks of ED visits and death (Table 1), but not urgent care visits, with stronger effects among older adults, patients with comorbidities, and those with advanced cancers

CONCLUSIONS

- Our study confirmed neurological and GI symptoms as two prevalent clusters within the first 90 days of CTX initiation.
- Short-term changes in neurological and GI clusters exhibited differential associations with long-term healthcare utilization and mortality.
- Only the neurological cluster showed a positive association with the risk of urgent care visits. Neurological symptoms are often chronic in nature and may not require emergency-level care, making them more appropriately managed in urgent care centers.
- In contrast, GI symptoms tend to be more acute and potentially life-threatening, often requiring timely medical intervention. This may explain their stronger associations with ED visits and hospital admissions.
- The GI cluster showed a borderline positive association with mortality, and no significant association was found between the neurological cluster and mortality. These findings reinforced that GI symptoms and their consequences, such as dehydration and electrolyte imbalance, are generally more acute than neurological symptoms and need timely management.
- Early management of these clusters has the potential to reduce healthcare utilization and the relevant costs.

FUNDING

No fundings were reported in this study.

ETHICS REVIEW

This study was approved by the Dana-Farber/Harvard Cancer Center (DF/HCC) Institutional Review Board (IRB protocol number: 25-048).

CONFLICTS OF INTEREST

No conflicts of interest were reported.