

A systematic review of the economic costs of gastrointestinal consequences of treatment for cancer patients and healthcare providers

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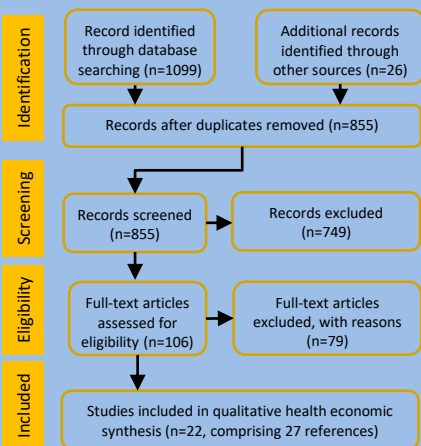
Background: Over 50% of cancer patients are expected to survive 10 years after diagnosis. Acute and chronic gastrointestinal (GI) toxicity can seriously impact patients' ability to live a normal life. One in three patients suffer from faecal incontinence and toilet dependency after GI surgery for a rectal cancer and, nearly 50% have chronic side effects (e.g. diarrhoea, faecal incontinence, abdominal pain) after pelvic radiotherapy. These toxicities reflect an economic burden to patients, healthcare providers and society as a whole.

Aim: A systematic review of the economic costs of gastrointestinal toxicity following cancer treatment (CRD42017067800).

Methods: A search was undertaken across 9 databases and grey literature sources. Quality assessment was carried out by two independent reviewers, using an adapted CHEERS checklist.

Results: A total of 22 studies reporting GI consequences from cancer treatment were identified.

PRISMA



Description of included studies

Author, Year	Country	Cancer treatment	Sample size	Acute & Chronic GI toxicity	Acute GI toxicity	Chronic GI toxicity
Etling, 2007	USA	Radio	204	✓		
Hummel, 2012	UK	Radio	Hypoth.			✓
Redmond, 2018	Republic of Ireland	Radio	112			✓
Vanneste, 2015	The Netherlands	Radio	Hypoth.			✓
Wood, 2015	USA	Radio	11,781			✓
Yong, 2012	Canada	Radio	Hypoth.	✓		
Chu, 2009a	USA	Chemo	1,396	✓		
Chu, 2009b	USA	Chemo	4,973	✓		
Cohn, 2011	USA	Chemo	Hypoth.			✓
Ercolani, 2011	Italy	Chemo	Hypoth.			✓
Peng, 2018	China	Chemo	Hypoth.			✓
Zogg, 2016	USA	Surgery	68,462			✓
Zogg, 2018	USA	Surgery	293,967			✓
Bristow, 2011	USA	Combi/Any	Hypoth.			✓
DeCosta Byfield, 2013	USA	Combi/Any	5,262	✓		
Jordan, 2017	UK	Combi/Any	218			✓
Klimora, draft	UK	Combi/Any	271	✓		
Muls, 2016	UK	Combi/Any	325	✓		
Nonzee, 2008	USA	Combi/Any	139	✓		
Nooka, 2014	USA	Combi/Any	524	✓		
Peters, 2016	USA	Combi/Any	Hypoth.	✓		
Zhang, 2018	USA	Combi/Any	370			✓

Study characteristics: The studies were quite heterogenous. Studies differed in methods and quality. Sample size ranged from 112 to over 293K. Similarly, follow up time varied between from 6 weeks to 10 years. Most studies did not differentiate between chronic and acute toxicity.

Standard quality assessment checklists proved difficult to apply to costs studies.

Costs estimates: Hospitalisation is a key cost driver. When available, standard deviation and range suggest a very wide distribution of costs. There is a focus on secondary care data. Primary care data is very limited and, data on costs borne by patients, family and society was also limited. One study calculated lost income.

Range of costs per patient (£)

Treatment	Type of cost	All GI toxicities	Focus on one GI toxicity (e.g. Diarrhoea)
Radiotherapy	Total	£1,877 to £4,749	£1,758 to £1,990
Chemotherapy	Monthly	£192 to £ 380	£16 to £902
Surgery	Annual	£3,864 to £5,361	No data
Combi/Any	Total	£1,606	No data

Recommendations:

- It has now become important to map the short and long term toxicity profile of cancer treatment.
- It is important to counsel patients on adverse late effects.
- There is a need to set up proper long term patients surveillance to trigger earlier referral of cancer-related toxicity.

Conclusion: Evidence is scarce, even so it shows the need to account for both acute and chronic toxicities when comparing the cost effectiveness of alternative cancer treatments.

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