# Are we delivering high-quality medical oncology care? A national comparison of severe acute toxicity from Systemic Anti-Cancer Therapy (SACT).

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## BACKGROUND

- The delivery of Systemic Anti-Cancer Therapy (SACT) is a complex care process.
- There is ongoing approval of new SACT drugs, with newer biological agents having more unique toxicity profiles.

- In the United Kingdom (UK), there are no standardised national protocols for SACT delivery.
- There is therefore huge scope for *variation in practice*.

- There has been little review of the quality of SACT delivery & limited research surrounding appropriate metrics for measuring the quality of SACT delivery.
- To our knowledge, there are currently no national reporting programmes for SACT delivery.

**AIM:** ***Use a previously validated coding framework[1] as a performance indicator in order to evaluate between-hospital variation in severe acute toxicity (CTCAE Grade ≥3) from SACT in colorectal cancer patients.***

## METHODS

**Data sources**

- National Bowel Cancer Audit (NBOCA), Hospital Episodes Statistics (HES), and Systemic Anti-Cancer Therapy (SACT) data linked at patient-level.
- NBOCA → prospective mandatory database for all newly diagnosed colorectal cancer patients in the English National Health Service (NHS).
- HES → routinely collected data for all admissions to English NHS hospitals with diagnoses coded using the International Classification of Diseases, 10th revision (ICD-10).
- SACT dataset → bespoke and detailed chemotherapy dataset for all English NHS providers.

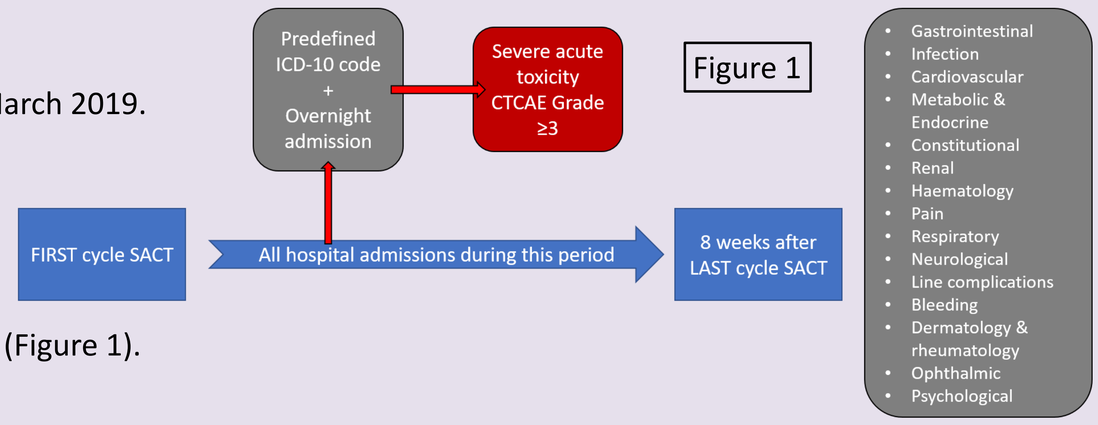
**Study population**

- NBOCA patients with colorectal cancer diagnosed and treated between 01 April 2016 and 31 March 2019.
- Stage III – *adjuvant cohort* – standard chemotherapy within 4 months of major resection.
- Stage IV – *metastatic cohort* – chemotherapy initiated within 4 months of diagnosis.

**Defining the performance indicator**

- Identification of severe acute toxicity (CTCAE Grade ≥3) from hospital administrative data.
- Pre-defined list of ICD-10 codes indicative of a SACT-related toxicity in context of SACT delivery (Figure 1).

Figure 1




**Between-hospital variation**

- Funnel plots used for each cohort to identify potentially outlying hospitals defined as those with results differing to the national average by either:
  - 2 standard deviations (corresponding to 95%-control, or inner, funnel limits), or
  - 3 standard deviations (corresponding to 99.8%-control, or outer, funnel limits)
- Risk-adjustment for age, sex, number of comorbidities, performance status (ECOG), tumour site, and staging.

## RESULTS

- 106 English NHS hospitals delivering SACT.
- Considerable between-hospital variation in severe acute toxicity with >20 potentially outlying hospitals (Figures 2 & 3).

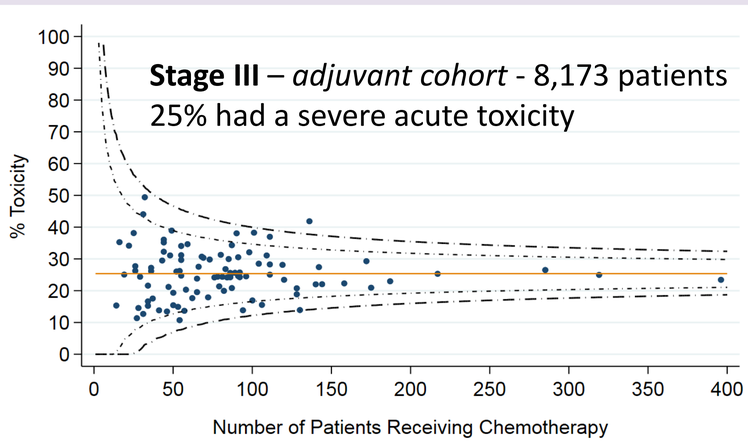



Figure 2

Adjusted severe acute toxicity range – 11% to 49%

**Compared to national average:**
1 x hospital 3 standard deviations above
5 x hospitals 2 standard deviations above
4 x hospitals 2 standard deviations below

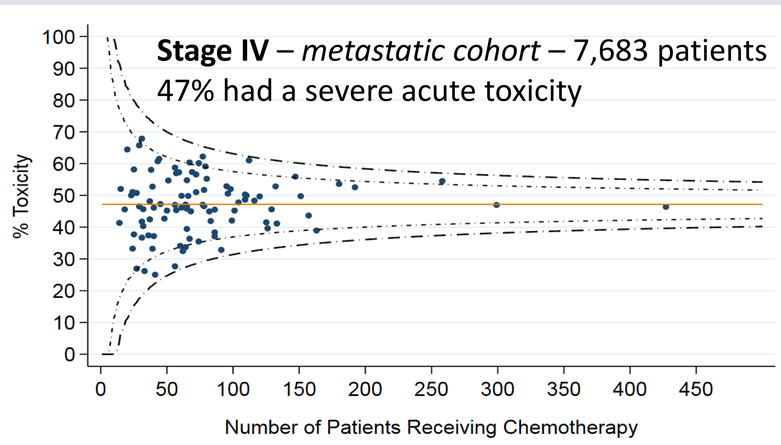
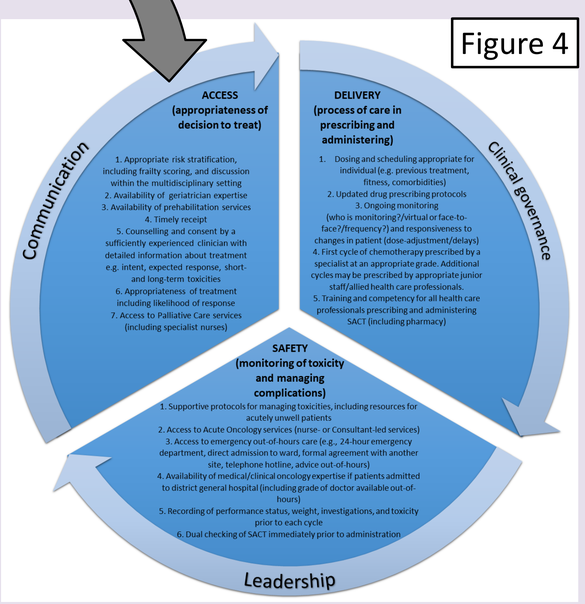



Figure 3

Adjusted severe acute toxicity range – 25% to 67%

**Compared to national average:**
6 x hospitals 2 standard deviations above
7 x hospitals 2 standard deviations below

Figure 4




A quality improvement conceptual framework was constructed in order to highlight potential areas within the SACT care pathway that may represent sources of variation in care (Figure 4).

## CONCLUSIONS

- **Substantial variation in severe acute toxicity between hospitals in both the adjuvant and metastatic settings, despite extensive risk-adjustment.**
- **Coding framework can be applied across different SACT drugs and tumour types, as well as being internationally applicable (ICD-10 codes).**
- **Severe acute toxicity performance indicator will be used as part of a publicly reported outlier program in the UK for ongoing monitoring of care.**
- **Can be used to explore unwarranted variation in toxicity, stimulate local/national quality improvement, and guide informed patient choice.**

**References**

1. Boyle JM, Cowling TE, Kuryba A, et al. Development and validation of a coding framework to identify severe acute toxicity from systemic anti-cancer therapy using hospital administrative data. Cancer epidemiology 2022;**77**:102096.

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HQIP
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NBOCA National Bowel Cancer Audit