Cancer Care Ontario

Variation In Intensive Care Unit Utilization and its Impact on Funding

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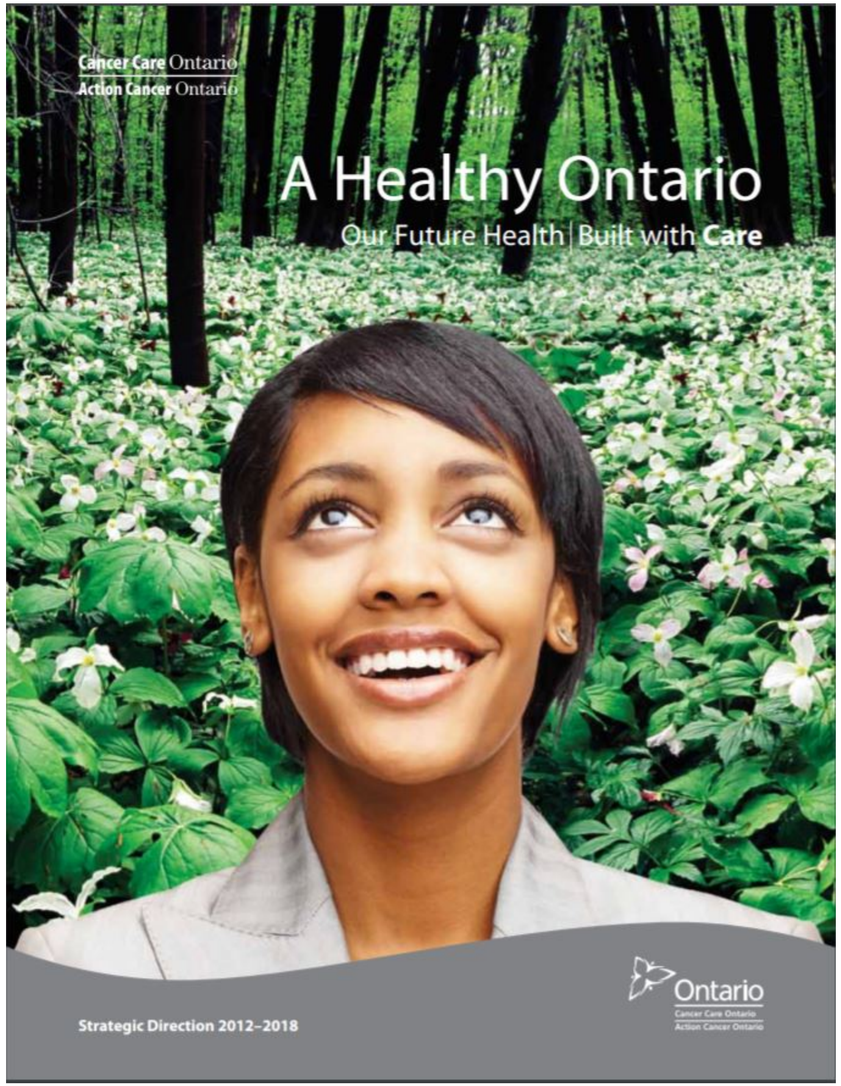
CCO's Value for Money Strategy

Goal: *Maximize the value of care delivered in health systems by measuring and improving the use of resources*



Purpose

This funding policy research evaluates possible unwarranted variation in Intensive Care Unit (ICU) utilization and funding within the Cancer Surgery QBP.

Cancer Surgery Quality-Based Procedure (QBP)

- QBPs are clinical clusters that reflect an individual's disease, diagnosis, treatment and acuity.
- Funding per case in the Cancer Surgery QBP is based on:

  provincial price per weighted case (base price) x hospital-specific average weight per case (case mix index)
- The CMI reflects the hospital's case mix, or the average complexity of its cases.

Funding per case for Cancer Surgery QBP, FY2017/18

Cancer Surgery Disease Site	Base Price	Provincial Average CMI	Average Funding per Case
Colorectal	$5,105	2.58	$13,171
Prostate	$4,943	1.44	$7,116
Thyroid	$5,174	0.77	$3,984
Breast (w/ immed. Recon)	$5,869	1.41	$8,099
Breast (w/o immed. Recon)	$5,066	0.56	$2,837
Breast (Delayed recon.)	$5,542	0.89	$4,766

Intensive Care Unit (ICU) Utilization

ICU Use as Supply-Sensitive Care

- For many conditions, ICU use is a supply-sensitive service, meaning it is influenced by providers' behaviors and hospital/health system characteristics.
- Unwarranted variation in utilization is a concept defined as utilization or spending on health services unrelated to evidence-based care or patients' treatment preferences, and often unrelated to improved outcomes.

Financial Impact

- The Canadian Institute for Health Information (CIHI) reports that the average cost of an ICU bed is $3,592 each day, whereas the average cost of a general ward bed is $1,135 each day.
- QBP cases with ICU use receive a higher weight, which results in higher QBP payments.

Data and Methods

- The Canadian Institute for Health Information's (CIHI) resource intensity weight methodology for Ontario inpatient stays was replicated (used to to calculate hospital's Case Mix Index (CMI)).
- Colorectal Cancer Surgery QBP cases from fiscal year 2015/2016:
  - Discharge Abstract Database (DAD) contains data on inpatient stays in Ontario, including ICU use
  - Patient characteristics: age, gender, and Charlson Comorbidity Index (Charlson was calculated using a 1 year lookback window and scoring method by Quan et al)
  - Patient exclusions: pediatric cases, non-residents of Ontario, not eligible for provincial insurance, or cancelled/abandoned
  - Facility exclusions: hospitals with fewer than 20 cases within the fiscal year were excluded from analyses of hospital rates and policy options.

Variation in ICU Use by Hospital

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Variation in QBP Funding per Case

- Study focus: QBP-funded colorectal cancer surgeries
- QBP payments per case can vary widely between hospitals based on their Case Mix Index (CMI)

Summary of variability in colorectal cancer surgery QBP-funded activity and prices, fiscal year 2015/16, hospitals with < 20 cases excluded

Variation in ICU Use

- Variation between hospitals in Intensive Care Unit utilization was observed across Cancer Surgery QBP disease sites.
- Colorectal cancer surgery cases had the highest average provincial ICU utilization, as well as high variation between hospitals.

Table 2: Summary of variability in colorectal cancer surgery QBP-funded ICU admissions, fiscal year 2015/16, hospitals with < 20 cases excluded

Factors associated with ICU Use

- A logistic regression model was used to assess the relationship between ICU admission and hospital volume, adjusting for patient-level factors.

Odds Ratio Estimates for factors associated with ICU admission, 2015/16

ICU Use and Patient Outcomes

Is there an association between ICU admission and available quality indicators?

- To test whether ICU use may be protective against negative clinical outcomes, logistic regression was used to assess the relationship between ICU use and readmissions and Emergency Department (ED) visits within 30 days of discharge.
- No association was found.

Readmission and Emergency Department Visits within 30 days of discharge for colorectal cancer surgery cases, fiscal year 2015/16

Funding Policy Options

- There is strong evidence that funding for cancer surgery QBP cases is in part affected by variation in provider-driven ICU use, and appears to be unassociated with available outcome measures.

- The impact of three potential policy options for reducing hospitals' incentive to admit QBP patients to the ICU were explored:
    1) Cap at Ontario mean colorectal cancer surgery QBP ICU admission rate,
    2) Cap at volume group-specific mean ICU admission rate,
    3) Cap at 15% of cases (in alignment with funding policy in the Netherlands).

Funding Impact

Analysis of three policy options for creating incentives for reducing unwarranted variation in ICU utilization

Conclusion

- Ontario’s current funding policy of paying for unwarranted variation in ICU utilization is associated with ineffective care and inefficient distribution of resources.
- Funding policy options are available that would change hospital incentives for ICU utilization.
- Non-funding policy options such as information sharing or mentorship by peer hospitals on patient care pathways and ICU admission after cancer surgery should also be explored.
- More research is needed on ICU demand and supply characteristics.

Thank you!

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