The cost of colorectal complications in New Zealand

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The rate of colorectal cancer (CRC) in New Zealand is among the highest in the developed world and CRC is the second highest cause of cancer death in New Zealand. A combination of the aging population and an increased rate of CRC diagnosis in young people mean that this will continue to be a health priority over the coming decades accounting for over NZD100 million by 2026.1

Screening for CRC is currently being introduced in order to identify CRC at an earlier and more resectable stage. This is expected to increase the volume of colorectal resections performed in New Zealand, leading, initially, to an associated increase in healthcare costs.

Risk factors for complications in major colorectal surgery include obesity, diabetes, age and comorbidity.2 All of these are also steadily increasing, leading to an increased risk of perioperative complications. Acuity of surgery and pre-operative loss of condition also contribute to poorer post-operative outcomes.

Meanwhile, the costs of healthcare continue to exceed the available public funding, leading to a need for efficiency in healthcare spending. By definition, cost-efficiency in healthcare spending demands delivery of high-quality care, as anything less than this leads to poorer outcomes which accrue more cost.3 In this issue, Sheikh et al4 present a cost analysis of adult patients undergoing resectional colorectal surgery for malignancy in a regional New Zealand hospital between January 2011 and December 2016. The hospital-associated costs of those developing complications from their surgery were compared with the costs from those who did not. Three hundred and ninety patients were identified. Of these, 107 developed a complication (27.4%) and the median cost of hospital treatment per patient was $17,090. In those that developed a complication however, the median cost per patient was $28,483, compared to $14,697 for those that did not. The costs increased as the Clavien-Dindo grade of complication increased.

Internationally reported rates of complications vary but occur in as many as a third of cases, with up to 6% requiring return to theatre. Complications include wound issues such as superficial infections, haematomas and partial or full thickness dehiscence; about one in five of these cases will require return to theatre. Anastomotic leak or deep tissue space infections occur in between 3–10% of cases and account for almost a third of re-operations. Other complications include ileus (in up to a quarter of patients), obstruction, cardiorespiratory adverse events, post-operative bleeding, urinary complications or thrombotic events.2,3,5 Apart from an increase in hospitalisation and perioperative costs, complications in colorectal surgery are also associated with ongoing morbidity, impaired quality of life and poorer oncologic outcomes with further economic costs which are more difficult to quantify. The present study focuses on direct hospital-associated costs. From a societal perspective, indirect costs of health conditions are important to consider. These include such factors as lost productivity, travel and carers, and can amount to as much as a third of total healthcare costs.5 It is likely post-discharge direct and indirect costs would increase proportionally with the cost of complications, hence including them in the total cost of care would increase the magnitude of these findings even further.

For the above reasons, systematised strategies to reduce complications have been investigated. Probably the most exhaustive health system-wide example is...
the introduction of the National Surgical Quality Improvement Program (NSQIP) by the American College of Surgeons (ACS) in 1994. The ACS NSQIP is an ongoing programme in which trained data-collectors collect demographic, procedural and 30-day outcome data on eight surgical specialties from participating institutions. Risk-adjusted outcomes are then derived, which allow comparison of outcomes between different centres. The introduction of NSQIP was associated with a significant reduction in 30-day morbidity (45%) and mortality (31%) between 1994 and 2005. This effect appears to be sustained and possibly continuing to improve, supporting its continued role in healthcare quality. The process of introducing NSQIP has identified that introducing intervention 'bundles' or systematised protocols designed to reduce specific complications (for example surgical site infection) appears to be more effective than any individual components of these protocols. A number of strategies to reduce individual complications have been described, including ‘prehabilitation’, enhanced recovery after surgery and ‘surgical site infection bundles’. A financial investment is required to participate in the ASC NSQIP, including the salary for each institute’s data collector and a payment to the ASC. A recent pilot study was performed in Alberta, Canada assessing the cost of implementing this and the estimated cost-savings. An investment return of $4.30 for every $1 spent was calculated, leading to net savings of approximately $8.8 million.

Four centres in New South Wales (NSW), Australia have recently published a pilot study outlining their results and experience of enrolling in NSQIP. It is anticipated that they will expand this programme within NSW in the future. Their risk-adjusted outcomes were compared with those of the broader NSQIP cohort and identified areas for potential improvement. Some of the outlying measures, such as the significantly higher readmission rate, can be understood within the different social contexts, where Australia provides free access to emergency departments and perhaps has less community-based support to prevent unnecessary readmissions. Reassuringly, mortality was better than average with an odds ratio of 0.95 possibly reflecting access to intensive care services in these centres.

In Australasia, the Bi-National Colorectal Cancer Audit (BCCA) has been in place since 2007, and the number of participating institutions has continued to expand. In 2017 approximately 13% of the total number of newly diagnosed colorectal cancers in Australasia were captured in the audit, which looks at primary key performance indicators (KPIs) including inpatient death, return to theatre, anastomotic leak, number of lymph nodes examined and circumferential resection margins (rectal cancer). Secondary KPIs include the use of adjuvant chemotherapy, length of stay, ‘surgical complication rate’, permanent stoma rate and for rectal cancer, discussion at multidisciplinary meeting and magnetic resonance imaging for staging. For the wider general surgical community, participation in this audit is voluntary but facilitates ongoing monitoring of surgical quality and risk-adjusted benchmarking.

In New Zealand, the Bowel Cancer Quality Improvement Report was recently released detailing the relative performances of the district health boards (DHBs) on six measures of surgical quality: 90-day mortality, rate of emergency surgery, length of stay, minimum of 12 lymph nodes examined and for rectal cancer, the receipt of adjuvant therapy and stoma free rate at 18 months. This demonstrated the diversity in presentation and types of treatment received across the different DHBs, although there is some debate over the relevance of some of the measures both in terms of their validity as measures of quality and the completeness of the data collected.
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Nil.

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