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Measuring the cost of continuous improvement in care in cancer

A WA 'proof of concept' project

Background

The goal of value-based healthcare (VBHC) is to focus on improving patient health outcomes within a resource constrained context.

To understand value, both the processes that lead to optimal outcomes for patients and the cost of achieving these outcomes over the full care cycle must be determined.

This analysis of key drivers of cost and patient outcomes over time is important so that patients receiving particular interventions who experience a variation in health trajectory or costs can be identified.

Introduction

This health economics research project extends the 'Continuous Improvement in Care (CIC) Cancer' Project (www.ciccancer.com)—an overarching research program that involves consumers, clinicians, public and private health services, and researchers collaborating to measure value-based outcomes important to cancer patients, using the International Consortium for Health Outcome Measures (ICHOM) standard sets. The CIC Cancer results will identify gaps in individual health services and variations in patient outcomes; and develop new research and quality improvement programs to address these gaps, and improve clinical practice.

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Building on CIC Cancer implementation of patient-reported outcomes (PROs) into standard care of breast, lung and colorectal cancer patients within Royal Perth Hospital (RPH), this 'proof-of-concept' study is undertaking economic evaluation to quantify quality of life (QoL) and cost-effectiveness to inform assessment of ongoing sustainability. This will refine how both resource use and patient outcome data are collected and used, as we move to embed PROs into routine data collection in the WA public and private health system.

The project will incorporate the five level EQ-5D-5L, a widely used instrument for measuring health-related QoL. It is also a key patient input in health economic evaluation of new interventions. The project will explore how best to embed the instrument to ensure maximum completion without overburdening patients. It will then use the collected data to identify which patients and treatment characteristics are good predictors of different outcome trajectories.

Methodology

Patient-reported outcome measures (PROMs) and clinical data (demographics, diagnosis, stage, treatment and outcomes) are collected at key time points during the patient journey for all consented RPH patients over 18 months for a minimum of 250 patients diagnosed with non-metastatic breast, lung and colorectal cancer (Figure 1). Additionally, the activity-based funding (ABF) costs of healthcare for all patients involved in the project—including surgery, days in hospital, outpatient events, chemotherapy, radiotherapy and supportive care—are collected retrospectively from the Business Intelligence Unit at RPH.

External cost data, such as costs of radiotherapy, are sourced directly from the service provider where organisational agreements exist to share this data. If an external cost is unable to be determined directly from the source, assumptions are made based on published literature or the Medicare Benefits Schedule. To verify that the clinical and costing data collected is accurate, medical record review of 10% of participants is being undertaken. >
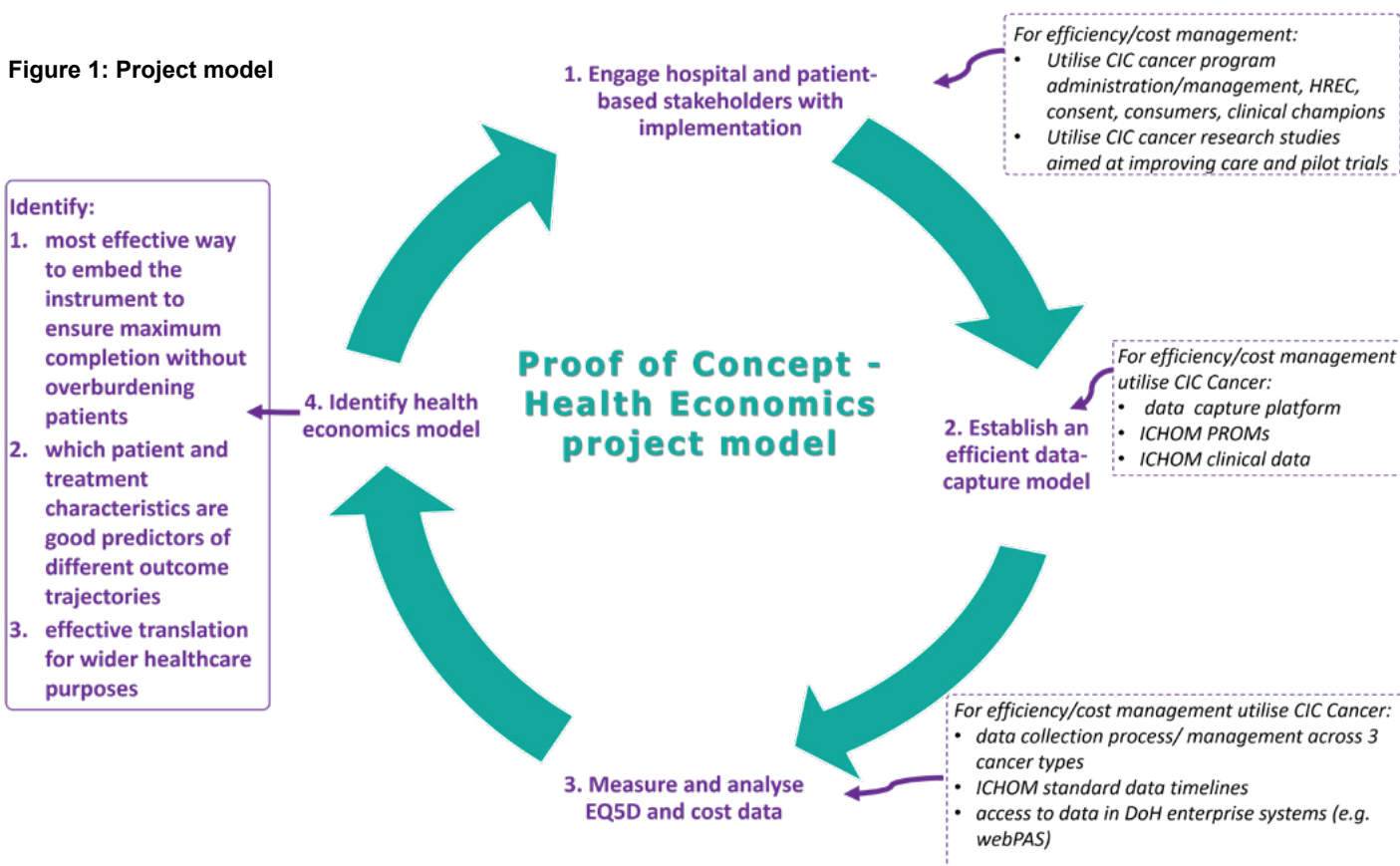
> **"Half way through the project timeline, a total of 130 newly-diagnosed cancer patients have been recruited across three tumour streams and the patient-reported outcomes collected at baseline, 3 and/or 6 months, and 12 months, to be used for understanding outcomes that matters most to patients."**

Once collected, the data are cleaned to ensure costs are relevant to cancer care and then analysed by health economists at Curtin University. Data analysis will include: descriptive exploration of patterns in QoL across the patient population; assessment of missing data or exploration of missing data patterns; prediction of non-completion of EQ-5D-5L data to test for response bias (using logistic regression); and exploration of longitudinal change in QoL (through panel data econometrics).

Through linking changes in QoL with clinical events we seek to tease out those interventions and events (and the resultant costs) which cause a fundamental shift in QoL trajectory in these populations.

Figure 1: Project model

Proof of Concept – Health Economics project model

1. Engage hospital and patient-based stakeholders with implementation

For efficiency/cost management:
- *Utilise CIC cancer program administration/management, HREC, consent, consumers, clinical champions*
- *Utilise CIC cancer research studies aimed at improving care and pilot trials*

2. Establish an efficient data-capture model

For efficiency/cost management utilise CIC Cancer:
- *data capture platform*
- *ICHOM PROMs*
- *ICHOM clinical data*

3. Measure and analyse EQ5D and cost data

For efficiency/cost management utilise CIC Cancer:
- *data collection process/ management across 3 cancer types*
- *ICHOM standard data timelines*
- *access to data in DoH enterprise systems (e.g. webPAS)*

4. Identify health economics model

Identify:
1. most effective way to embed the instrument to ensure maximum completion without overburdening patients
2. which patient and treatment characteristics are good predictors of different outcome trajectories
3. effective translation for wider healthcare purposes

Results to date

Half way through the project timeline, a total of 130 newly-diagnosed cancer patients have been recruited across three tumour streams and the patient-reported outcomes collected at baseline, 3 and/or 6 months, and 12 months, to be used for understanding outcomes that matters most to patients.

Reduced attendance at hospital clinics, a switch to telehealth during the COVID-19 pandemic, dispersal of research personnel to other sites and clinical areas during the COVID-19 response, and suspension of cancer screening programs (such as BreastScreen WA) have affected the number of new patients referred to the clinics, and thus access to those patients. These obstacles were mitigated through implementation of new processes and additional ethics approvals for working off-site, phone recruitment, and use of verbal consent.

Use of ABF costing data has identified individual patient pathways and associated costs throughout diagnosis and treatment. Pilot health economics analysis, using QoL and costing information from a sample of 30 patients, has been completed and this has indicated the scope of available data is suitable for larger exploration.

Next steps

Patient recruitment and data collection will continue for the ICHOM-determined time points for each cancer type. Processes to complete cost analysis will include integration of QoL and cost data, exploration of associations between costs and QoL data, and comparison of the distribution of costs by categories of QoL. In addition, an algorithm will be developed to capture potential cost for the patient pathway. The inputs to this algorithm will be derived from optimal care pathways (OCPs) used as standard clinical guidelines in cancer care in Australia.

A process will be developed so that data are available to health services, policy-makers and researchers to provide continuous feedback on how services perform, and inform healthcare planning and commission/purchasing strategies locally and nationally. **ha**