Editorial’s View:  
Dr. Stafford Dean,  
Senior Program Officer, DIMR

Can We Leverage the CIS to Enable Bottom Up Clinical Costing?  
We all know the potential our investments in Clinical Information Systems (CIS) have on improving the health outcomes of Albertans.  
The clinical granular data needed to help transform health care will be a by-product of everyday patient care activity if we implement the CIS effectively.  
The data created in the CIS can be used both real time and after-the-fact (secondary use) to help improve patient safety, increase clinicians’ productivity, support research and improve outcomes.

But what about leveraging the CIS investments to enable bottom-up detailed clinical costing?  In order to achieve the triple aim – improved outcomes, experience, and cost – we will need data across each aim, including cost data at the most granular level, to truly get at value for money.  
Today’s cost allocation models operate in a predominantly top-down fashion and provide valuable high level insights on the cost of disease, but bottom-up costing linked to clinical activities will be more relevant and actionable for our front line clinicians.  
The challenge with top-down allocation is that many costs tend to be spread evenly across many areas and we lose the ability to fully capture the true variation in cost.

The CIS offers enormous potential to get at a rich level of clinical costing by leveraging the charging and billing functionality that most CIS vendors offer.  
For-profit systems like those in the United States require functionality to bill their patients and insurance plans.  
Detailed itemized clinical activities are coupled with specific charges to arrive at an itemized bill.  In many cases, this is a real-time process where (out of pocket paying) patients leave the hospital with a bill, so technically we can have a detailed estimated cost at time of discharge.  
The key to leveraging this functionality for bottom-up clinical costing in a CIS, is swapping out the charge tables with estimated cost tables.  
The challenge is building the estimated cost tables.

We would suggest starting with a decision on the level of clinical activity granularity we would like to track, coupled with obtaining the best possible estimated clinical activity cost that is feasible.  The key here is not to strive for precise clinical activity costing (this would be far too costly and time-consuming to manage), but decide at what level of granularity and how frequently we want to update the clinical activity cost lists.  
Over time, we would develop more accurate and more granular costing tables to support clinical costing.

Clinical activities are many, from lab, DI, drugs, to clinical nurse actives like, vitals, wound changes, ambulation, and so on.  
Estimating the cost of these activities would be challenging; however, using standardized workload estimates and other costs and updating those on a regular basis would provide us with much better costing data than we have now...

(Continued on pages 4-5)
Economic Evaluation in AHS: CKM Story

There has been a growing interest among healthcare system managers and executives to shift service utilisations from acute care to community. The logic and reasoning behind that rooted in the need to balance healthcare budget to cope with the budget constraints and the growing demand for healthcare services. This is compounded by the desire to improve quality of care and reduce harm to patients by avoiding unnecessary aggressive treatments.

One way to exemplify those desired outcomes is to provide non-aggressive cares to patients with chronic diseases who are at the end stage of their lives. It has been well documented that patients with very advanced chronic diseases utilize significant healthcare resources such as emergency department and acute care services during the last month of their lives with no anticipation of improvement in their conditions and/or gain in their quality of life.

The Kidney Health Strategic Clinical Network (SCN) is developing a provincial, Conservative Care Pathway for patients unlikely to benefit from dialysis (www.CKMcare.com). These patients have complex needs that range from symptom management to advance care planning and preparing for end of life. Conservative Kidney Management (CKM) is a treatment option that some kidney disease patients choose as an alternative to dialysis. For older patients who have higher levels of co-morbidity and poorer functional status, there may be no survival or quality of life advantage to dialysis.

Older, frailer patients tend to experience functional and cognitive decline after starting dialysis. In contrast, frail, elderly patients with multiple co-morbidities may preserve their functional status, maintain a better overall quality of life, and have fewer hospital admissions while being treated with CKM.

Economic evaluation of CKM is a crucial part of the pathway development and implementation to show value for money and demonstrate how and where better outcomes and lower cost are realized. To conduct a rigorous evaluation, the CKM project uses information gathered from patient charts, administrative databases and surveys to evaluate, impact on patients and the health care system as well as on the quality of care which will be assessed using six dimensions of the Alberta Quality Matrix for Health.

Retrospective data will be collected dating back to six years before the implementation of the CKM pathway in September 2016 and continuing until January 2018. The data elements that will be collected for the program include:

- Patient demographic
- Co-morbidities
- Uptake of CKM
- Proportion of patients remaining on the CKM pathway up to the end of the study time period/end of life
- Patient and/or caregiver (family) satisfaction with care
- Inpatient and outpatient service utilization
- Family physician visits
- Medication
- Transition to Institutionalized care
- Symptom control
- Physical function
- Quality of Life
- Budget Impact Analysis

Data sources for collecting the information include AHS administrative databases including Discharge Abstract Database (DAD) and National Ambulatory Care and Reporting System (NACRS), Alberta Kidney Clinics databases, and surveys.

The assessment and evaluation of this initiative has been planned for 2017/18. Stay tuned for further info from the Kidney SCN.

---

The CKM initiative intends to shift service utilization from acute care to community, i.e. care giver support and symptom management instead of dialysis. Therefore, economic evaluation of CKM should focus on changes in frequency and intensity of services utilized in both acute care and community by patient undergoing the CKM pathway compared with patients undergoing the standard treatment, i.e. dialysis. Given the structure of the CKM study which is based on a treatment and control group study and also since information on service utilizations of the patients will be collected prospectively, results of CKM evaluation will be fairly robust for decision making.

Need further info, please contact ckm.pathway@ahs.ca or call Vanessa Steinke at 587-773-4241.
Nobel Prize Offering for Health Economics!

References: For references and more reading on the subject, click on the following links: Link1, Link2, link3

2016 Nobel Prize in Economics Science has been awarded to Oliver Hart from Harvard University and Bengt Holmström from MIT for their contribution to Contract Theory. In the words of the Royal Swedish Academy of Sciences, “Oliver Hart’s and Bengt Holmström’s research sheds light on how contracts help us deal with conflicting interests”.

Economic transactions between self-interested economic agents (e.g. lawyers, physicians, managers etc.) can give rise to conflicts of interests. Contracts help avoiding economic losses and undesirable social outcomes by generating trustworthiness and enforcing cooperation between agents (e.g. payers and providers). The Contract Theory is based on the informativeness principle which suggests incentives in optimal contracts must be linked to those outcomes that are observable to the principle (stakeholders). Following the informativeness principle, co-payments should be implemented for those health care goods and/or services whose demand is closely related to and a consequence of patients’ behaviour. The Contract theory is also relevant for the design of incentives for health care providers. Providers are agents of both patients and the health care system (principals), and they are potentially conflicted in terms of the care they provide due to a problem known as the principal-agent relationship.

A defining feature of Oliver Hart’s contribution was the theory of incomplete contracts. Given contracts cannot specify every eventuality, Hart and his colleagues posited that it can be helpful to agree now to agree later. An example of incomplete contracts in health economics is Performance Based Risk-Sharing Agreements (PBRSAs) where pharmaceutical firms negotiate higher prices for those drugs that demonstrate higher value or less uncertainty ex post. When the value of a new medicine is difficult to ascertain ex ante at the initial contracting point between a payer and pharmaceutical company, an alternative is to track the performance of the product in a defined patient population over a defined time period, so that reimbursement is based on the health and cost outcomes achieved. PBRSAs represent a mechanism for reducing uncertainty at product launch and incentivizing investment in evidence collection while a technology is used within a health care system.

Incomplete contract theory can also be applied to the debate on public versus private health care provision. Should health care provision be privatized? Incomplete contract theory showed that this depends on the nature of non-contractible investments such as cost-reduction or quality improving investments. Hart and colleagues, in their article “The Proper Scope of Government: Theory and an Application to Prisons”, demonstrated that if incentives for cost reduction are strong then the privatization of public sectors may be undesirable. This is because focusing on cost reduction alone may hurt the quality of the goods and services provided. As an example, the US Department of Justice recently stopped using private prisons after reports showed conditions are worse than government-run prisons.

Local vs. Global

The Canadian healthcare system is a publically funded system through both provincial and federal funding channels. In spite of that, hospitals are running on fixed budgets and must meet their local demands while decisions on funding of their services are made at provincial or municipal level. Alongside, the rise of complex, chronic diseases in an ageing population have led to the development of increasingly complex technologies which in many cases prompt the need to personalized and patient-centered cares with a focus on patient preferences and characteristics. A good practice in HTA requires considerations to all those issues and strategies takes them into account in a comprehensive assessment.

Internationally, Health Technology Assessment (HTA) is considered the leading approach to govern health systems, manage innovation and inform disinvestment decisions in public and private sectors. An effective system requires an integrated environment where interactions can occur at all levels including—international, national, regional and local. Each level holds different responsibilities and is characterized by a variety of stakeholders involved both in the provision and use of HTAs for decision-making. International collaborations, national and regional HTA bodies and hospital-based HTA units or functions all contribute to a sustainable healthcare network that requires coordination to improve clinical and organizational processes and patient outcomes.

In practice, evidence on safety, clinical effectiveness and technology diffusion are generally generated at a global level, while decision on the use of technology, cost, ethical, organizational aspects, and legal matters are made at local level. Therefore, HTA needs to develop logic models that consider the different aspects at various levels into one framework. That is, while local HTA have become more relevant to manage the system at local level, collaboration between HTA bodies, decision makers, policy makers, care providers and patient advocates at all levels are necessary to achieve desirable outcomes from implementation of healthcare technologies.
Data of HTA: An Overview

Evidence-base decision making requires healthcare technologies to be assessed and appraised before being adopted. Assessment of a technology is concerned about its clinical outcomes, safety and cost, while appraisal of the technology is related to its impacts on the system’s capacity, budget, equity, values, preferences, and acceptability. It is apparent that conduct of assessment requires different data and methodologies than conduct of appraisal. A good HTA practice should address, develop and facilitate both assessment and appraisal.

Moreover, data availability for assessment and appraisal is dependent to life cycle of the technology under question in which data on effectiveness and safety of a technology at pre-market stages are not available to use in HTA and so HTA mainly rely on evidence from post-market stages. However, it is worth noting that there is an opportunity cost for late adoption of a technology as it may reach to the obsolescence stage and so become less relevant and beneficial.

Therefore, to avoid of being a laggard in adoption of technology, Coverage Subject to Evidence Development approach might be recommended. In that scenario, the technology that is in its early stage of diffusion can be adopted in a limited fashion and under certain indication to facilitate collection of data on its safety and efficacy.

Overall, data of HTA can be ascertain from either RCTs, observational studies, cases studies, healthcare administrative databases, registries and surveillance databases, and/or from the literature. Availability of data for HTA and it sources/types may affect type of economic modeling that is feasible for the evaluation. Although, the most recent draft of the CADTH Economic Guidelines (the forthcoming fourth edition) emphasis that the lack of data is not a good reason to deviate from best HTA practice and modeling and so HTA doers must systematically and persistently look for data required for HTA.

Since HTA is conducted to support evidence-based decision making, then the goal should be using all available data in a transparent way in which decision makers are well informed and aware of consequences and outcomes of the technology under question.

Editorial’s View: Continued from page 1

The Analytics department completed a proof of concept using the clinical activity data created in the Allscripts Sunrise Clinical Manager (SCM) CIS in Calgary. We had to make educated guesses on the various activity costs, but we were able to demonstrate the mechanics for such a model can work.

We would propose that delivery areas working with Finance be the ones to own and update the costing of activities. Diagnostic Imaging (DI), for example, would work with Finance to build better and more granular costing for DI activities over time. Similarly, Nursing would work with Finance to estimate clinical activity workload and estimated costs for nursing, eventually being used to help with nursing scheduling and managing nursing workloads.

So if we believe in the value of a bottom-up clinical costing model, what should we do now to get ready?

1. Plan this up front; specifically, by making sure the functionality exists with the short-listed CIS vendors and is usable. We will need to build this into our evaluation criteria when selecting our CIS solution.

2. Further develop the methods we already have in AHS. Alberta Children’s Hospital has implemented SCM across Inpatients, Emergency Departments, and Clinics. We could start developing the methods for a bottom-up clinical costing system at that site, or other sites that are further down the road of CIS implementation.

NOTES ON DATA OF HTA IN AHS

Alberta Health Services has initiated several platforms to facilitate the access and the use of available healthcare data for purposes of evaluation, research, and design of quality improvement initiatives. Majority of essential data for those purposes, including inpatient care, outpatient services, physician claims, lab, diagnostic imaging, long term care and home care, have become available to evaluators and researchers in Alberta. Additional complementary data such as medication, cost data and clinic specific data are currently available case by case, which soon become available system wide. Also, Alberta is one of few provinces that hold comprehensive and detailed cost data, micro cost, from its main facilities and hospitals. The cost data are available to researchers through the finance department facilitated by the Research Administrative Department within AHS. Please see the links below for more details http://insite.albertahealthservices.ca/1764.asp http://www.albertahealthservices.ca/research/ page8579.aspx
Just imagine the value of having detailed clinical activity costing, patient experience data, and clinical outcome data at the pathway level. This would allow AHS to understand how our clinical processes relate to cost, experience and outcomes, and enable the ability to perform robust economic evaluation. More than just a Health Economist’s dream, this capability will serve as a powerful lever in designing a health system that is sustainable for decades to come.

The Newsletter Team:

Chair of the Newsletter: **Don Juzwhishin, PhD FCCHL**

The Chief Editor: **Mahmood Zarrabi, PhD**

The Editorial Advisory Committee:

**Stafford Dean, PhD (SPO DIMR)**

**Don Juzwhishin, PhD FCCHL (Director HTAI)**

**Rosmin Esmail, MSc CHE (Director HTAA)**

**Thach Lang, PhD LLB (Project Manager)**

For inquiry please contact Mahmood Zarrabi at Mahmood.Zarrabi@ahs.ca