INSTITUTE OF HEALTH ECONOMICS
ALBERTA CANADA

INNOVATIVE FUNDING MODELS Kidney Care Policy Options for the Future

Roundtable Summary Report

This roundtable was supported, financially and/or in-kind, by Baxter Canada, the Alberta Health Services Kidney – Strategic Clinical Network, and Alberta Health. Please note that the views expressed herein are not necessarily representative of any particular organization involved.

September 2015

Statement from the Chair: A Call to Action

The current approach to funding kidney care in Alberta is not aligned with the strategic goals for Alberta Kidney Care, and the Alberta Health Services Kidney – Strategic Clinical Network, including increasing the appropriate use of home dialysis, non-dialysis supportive care, and kidney transplantation. Current funding models, which are not well aligned with these priorities, should be re-examined to ensure consistent access to the most effective evidence-based therapies across the province, and to capitalize on new technologies that would support patients and caregivers for greater independence.

The *Innovative Funding Models: Kidney Care Policy Options for the Future* roundtable revealed that a successful kidney care funding model requires good data, adequate infrastructure, reasonable and predictable funding, and flexibility to accommodate for population growth. This paper provides pointed recommendations and next steps in creating a more effective and innovative health care funding model for kidney care treatment in the province. Creating incentives to increase the use of home therapies could realize cost savings of up to $20,000-$25,000 per patient per year. With over 2,300 patients undergoing dialysis in Alberta, the total estimated savings could be substantial.

Follow-up action to this report is imperative in order to fully realize potential benefits through the adoption of more effective and efficient patient-centred funding approaches. This report represents a call to action and serves as a catalyst to stimulate further discourse and action on this very relevant and timely issue. Next steps must be led by organizations including Alberta Health, Alberta Health Services, Alberta Kidney Care, and the Alberta Health Services Kidney – Strategic Clinical Network. I look forward to continuing this discourse with these groups as we work together to realign policies and funding models to better meet the needs of Albertans.

Dr. Braden Manns
Chair of the *Innovative Funding Models: Kidney Care Policy Options for the Future* Steering Committee
Interim Scientific Director of the Alberta Health Services Kidney – Strategic Clinical Network

Preface

The Institute of Health Economics (*www.ihe.ca*) held a roundtable on June 4, 2015, entitled *Innovative Funding Models: Kidney Care Policy Options for the Future*, to identify and discuss key issues in kidney care policy options. This roundtable was supported, financially and/or in-kind, by Baxter Canada, the Alberta Health Services Kidney – Strategic Clinical Network, and Alberta Health.

The goal of this project was to inform and guide regional and provincial funding approaches for kidney care, while building on best practices and lessons from other jurisdictions. The roundtable provided a shared learning experience involving key decision-makers/stakeholders in government, health service managers, clinical leaders, and industry to ensure key decision-makers are informed by latest evidence and best practices regarding optimal kidney care funding models. To ensure the scope of the project was manageable and consistent with the priorities of health care decision-makers, this initiative focused on funding models that encourage the use of home dialysis.

The background materials, including the *Innovative Funding Models: Kidney Care Policy Options for the Future* roundtable background reading and minutes from the *Innovative Funding Models: Kidney Care Policy Options for the Future* Steering Committee teleconference that took place in early 2015, as well as the proceedings of the *Innovative Funding Models: Kidney Care Policy Options for the Future* roundtable were used to inform the production of this report. The meeting was held under the Chatham House rule, allowing ideas from the meeting to be used without attribution.

Please note that the views expressed herein **are not necessarily representative of any particular organization involved**.

Please direct any inquiries about this report to Jasmine Brown, Senior Policy Associate, Institute of Health Economics, at jbrown@ihe.ca.

THE OBJECTIVES FOR THE ROUNDTABLE WERE TO:

- **Inform and guide** provincial funding approaches for kidney care, including the ability to increase the use of home dialysis, while building on best practices and lessons from other jurisdictions.
- **Provide a shared learning experience** with key decision-makers/stakeholders in government, health service managers, clinical leaders, and industry on the economic strategies to increase the use of home dialysis and the impact of home dialysis on clinical and economic outcomes.
- **Identify key action steps and execution framework** while ensuring issues are raised to address funding reforms for kidney care to enable care to be delivered in the home.

THE STRUCTURE OF THE ROUNDTABLE WAS AS FOLLOWS:

- *Moderator:* Dr. Braden Manns, Interim Scientific Director of the Alberta Health Services Kidney – SCN, Chair of the *Innovative Funding Models: Kidney Care Policy Options for the Future* Steering Committee

Overview of Funding Structure for Kidney Care in Alberta

- Dr. Adeera Levin, *The BC Provincial Renal Agency Funding Model*
- Dr. Peter Magner, *The Ontario Renal Network Funding Model*
- Professor Donal O'Donoghue, *The UK Experience*
- Dr. Scott Klarenbach, *The Impact of Different Funding Models for Kidney Care on Outcomes and Costs (Including the US Bundled Payment Experience)*

Breakout Topic 1: *Activity-based funding – Incentives, perverse incentives, quality metrics*

Breakout Topic 2: *Funding model implementation and reform in Alberta – Challenges, barriers, and incentives*

Recommendations

Summary of Discussion

Closing Remarks

PARTICIPANTS:

Dr. Braden Manns – Interim Scientific Director, Alberta Health Services Kidney – SCN; Chair of the *Innovative Funding Models: Kidney Care Policy Options for the Future* Steering Committee

Dr. Donal O'Donoghue – Professor of Renal Medicine, Manchester University; Consultant Renal Physician, Salford (**remote participation*)

Dr. Adeera Levin – Executive Director, BC Renal Agency (**remote participation*)

Mr. Dee-Jay King – Executive Director, Health Economics and Funding, Alberta Health

Ms. Ruby Brown – Assistant Deputy Minister, Health Services, Alberta Health

Dr. Phil Jacobs – Director of Research Collaborations, Institute of Health Economics

Dr. Scott Klarenbach – Associate Professor and Clinician Scientist, Department of Medicine, University of Alberta

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Dr. Nairne Scott-Douglas – Medical Director, Southern Alberta Renal Program

Ms. Cathy Osborne – Senior Operating Officer, University of Alberta Hospital, Mazankowski Alberta Heart Institute and Kaye Edmonton Clinic

Dr. Robert Pauly – Associate Professor - Nephrology, University of Alberta

Dr. Peter Blake – Provincial Medical Director, Ontario Renal Network

Ms. Ognjenka Djurdjev – Director of Decision Support for Provincial Health Services Authority, BC Renal Agency

STEERING COMMITTEE MEMBERS:

Dr. Braden Manns – Chair; Interim Scientific Director, Alberta Health Services Kidney – SCN

Dr. Adeera Levin – Executive Director, BC Renal Agency

Dr. Bruce Culleton – Global Medical Director, Baxter

Dr. Peter Magner – Associate Professor of Medicine and Health - Nephrology, University of Ottawa; Director of Hemodialysis, Ottawa Hospital; Provincial Lead, CKD Funding, Ontario Renal Network

Dr. Scott Klarenbach – Associate Professor and Clinician Scientist, Department of Medicine, University of Alberta

Dr. Nairne Scott-Douglas – Medical Director, Southern Alberta Renal Program

Ms. Carol Easton – Executive Director, Southern Alberta Renal Program

Dr. Tom Noseworthy – former Associate Chief Medical Officer, Strategic Clinical Networks and Clinical Care Pathways, Alberta Health Services

Executive Summary

Funding models play a significant role in driving health care decision-making, including the selection of different types of dialysis in people with advanced chronic kidney disease. The way in which government chooses to structure these funding models to meet health care systems objectives must consider a diverse mix of strategies and funding levers that can vary considerably across jurisdictions.

Alberta has identified the need to look at new funding models to support enhanced quality, effectiveness, and efficiency in health care delivery. Alberta has also made a commitment to focus on strategic and operational clinical networks within the province, and the Alberta Health Services Kidney – Strategic Clinical Network has recently been launched.

> ***"An aging population, rising diabetes rates leading to renal failure, and patients living longer due to medical advancements are all factors contributing to increases in demand for dialysis service in Alberta."***
>
> **Alberta Health Services (2015)**

Early priorities for the Alberta Health Services Kidney – Strategic Clinical Network include increasing the use of home dialysis, non- dialysis supportive care, and kidney transplantation. Funding models are not aligned with these priorities, and it is timely to examine and analyze different funding models within kidney care to both ensure consistent access to the most effective evidence-based therapies across the province, and capitalize on new technologies which would support patients and caregivers for greater independence.

Recent reviews of the two provincial kidney programs in Alberta have called for: a) a consistent provincial kidney funding envelope; and b) implementation of an activity-based funding model. There is also the need for establishing new funding models that would permit the implementation, assessment, and review of best practices, and would allow predictability of funding for this population of patients in the future.

The Institute of Health Economics (*www.ihe.ca*) held a roundtable on June 4, 2015, entitled *Innovative Funding Models: Kidney Care Policy Options for the Future*, to identify and discuss key issues in kidney care policy options. This roundtable was supported, financially and/or in-kind, by Baxter Canada, the Alberta Health Services Kidney – Strategic Clinical Network, and Alberta Health. Prior to the roundtable, an *Innovative Funding Models: Kidney Care Policy Options for the Future* Steering Committee teleconference refined project objectives, and the agenda and scope of the roundtable. The committee was formed and chaired by Dr. Braden Manns, the Interim Scientific Director of the Alberta Health Services Kidney – Strategic Clinical Network.

The goal of this project was to inform and guide regional and provincial funding approaches for kidney care, while building on best practices and lessons from other jurisdictions. The roundtable provided a shared learning experience involving key

stakeholders in government, health service managers, clinical leaders, and industry to ensure key decision-makers are informed by latest evidence and best practices regarding optimal kidney care funding models. To ensure the scope of the project was manageable and consistent with the priorities of health care leaders, this initiative focused on funding models that encouraged the use of home dialysis, a priority for Alberta kidney care policy-makers.

The background materials, including the *Innovative Funding Models: Kidney Care Policy Options for the Future* roundtable background reading and minutes from the *Innovative Funding Models: Kidney Care Policy Options for the Future* Steering Committee teleconference, as well as the proceedings of the *Innovative Funding Models: Kidney Care Policy Options for the Future* roundtable were used to inform the production of this report. The meeting was held under the Chatham House rule, allowing ideas from the meeting to be used without attribution. This document summarizes key points and provides high-level recommendations arising from discussions, but **does not represent a consensus view.**

Roundtable Recommendations

The recommendations identified at the roundtable focus on the following key areas where the provincial government has levers for change. As noted above, the recommendations below do not represent a consensus view.

1. **Funding model structure development and implementation**
    - The benefits of and lessons learned from the kidney funding models in British Columbia, Ontario, Australia, and the United States were analyzed. British Columbia was identified by the Steering Committee and participants as a possible leadership model of interest in need of further reflection.
    - Funding for kidney care should be within a predictable and protected envelope to allow for longer term planning. Providing kidney programs with some stability would allow them the opportunity to innovate better. This particular initiative could be driven by Alberta Health.
    - Since home dialysis is cost saving compared with in-centre hemodialysis, additional funding should be available to Alberta's kidney programs to meet the needs of the increasing numbers of patients treated with peritoneal dialysis, and other forms of independent dialysis.
    - The funding structure should account for longitudinal and variable courses with complex patients. Patient "years" should be used in the funding model, not patient "numbers."
    - Medical administration leadership should be built into a kidney care funding model.

- Incentives should be carefully structured so as to avoid unintended policy consequences.
- Changes to the structure and implementation of new kidney care funding models should be led by Alberta Kidney Care in collaboration with Alberta Health Services, and could be guided by input from the Alberta Health Services Kidney – Strategic Clinical Network.
- In order to set appropriate funding levels for bundles, a detailed costing study could be considered, in addition to consideration to historical funding levels.

2. Activity-based funding

- Participants noted potential advantages of activity-based funding including:
  - a stable funding level reflecting the activity of a kidney care program;
  - the ability to create financial incentives for home dialysis or other treatments prioritized by policy-makers given their effectiveness and cost savings; and,
  - the ability for such a system to collect information on quality of care.
- Consideration would be required to determine what activity would be funded within the bundle, and what activity would be funded outside the bundle, including whether or not resources for pre-dialysis care, chronic kidney disease-specific home care, and training costs be incorporated.
- It was generally acknowledged that in order to create an incentive to an activity, that activity should continue to be funded outside of the bundle. Alternatively, to create a disincentive to an activity, that activity should not be funded separately, but rather should be incorporated into a bundle.
- Bundles should not include too many items, so as to avoid the need to define a detailed standard of care for each item within the bundle.
- To implement activity-based funding, a provincial data collection system is required that captures high quality data using similar definitions across Alberta. This data could also be used to measure quality indicators, and drive continuous quality improvement initiatives.
- Activity-based funding may be an appropriate model to fund kidney care, but it appears less important than a protected envelope for kidney care that accurately reflects the number of people receiving dialysis in Alberta. If additional funding is required, the opportunity costs of that funding, in comparison to other uses of those resources, require consideration.

- Again, changes to the structure and implementation of new kidney care funding models should be led by Alberta Kidney Care in collaboration with Alberta Health Services, and could be guided by input from the Alberta Health Services Kidney – Strategic Clinical Network.

3. Provider and patient engagement to increase use of home dialysis

- Professional development (e.g. courses or programs) should be offered to nephrologists, nurses, and/or hospital administrators on best practices for people with advanced chronic kidney disease, including the use of peritoneal dialysis. A partnership could be established with universities, Alberta Kidney Care, and the Alberta Health Services Kidney – Strategic Clinical Network to develop and implement said professional development opportunities.
- Provider-patient decision support and educational programs should be created for patients with advanced chronic kidney disease to educate them on their treatment options. A partnership could be established with universities and patient groups, led by the Alberta Health Services Kidney – Strategic Clinical Network, to develop and implement both decision support and educational programs.

4. Reducing the impact of patient-borne costs for home dialysis

- Travel – Consideration should be given to government subsidies that cover costs for training, including travel and accommodation, which could create a greater incentive for patients to adopt home therapies.
- Electrical/water costs – Government could also help subsidize patient utility expenses, with an appropriate threshold so as to avoid unintended policy consequences. The subsidy could be limited to low socioeconomic status patients.
- Caregiver incentives – Incentives could be established for family members to take care of their parent or partner at home rather than going to in-centre dialysis. This could relieve some opportunity costs faced by caregivers.
- Further analysis on the costs and benefits of supporting patient-borne costs should be led by Alberta Health, in collaboration with Alberta Kidney Care and Alberta Health Services.
- Should it be noted as a relevant barrier to policy-makers in the future, consideration should be given to innovative practices in home dialysis, such as remote monitoring and telehealth. Alberta Health Services could lead the promoting greater access, uptake, and utilization of e-health in patient care.

5. **Adjustments to operating room allotments**
    - Where it is an issue, wait times should be realigned for differing operating procedures to bring operations such as peritoneal dialysis catheter insertion at par with more urgent operations such as in-hospital central venous catheter insertion.
    - Incentives and perverse incentives play a strong role in operating room wait times and should also be considered. This analysis could be led by the Alberta Health Services Kidney – Strategic Clinical Network.
6. **Implementation considerations**
    - The highest priority should be stable funding allocation that increases with increasing volume of kidney care in Alberta, such as occurs in British Columbia and Ontario.
    - If activity-based funding were implemented, a provincial data collection system is required that captures high quality data using similar definitions across Alberta.
    - Time is needed for funding transitions and reform, along with strong leadership and clear policy objectives.
    - Once defined, health policy leaders should implement the chosen activity-based funding model and pilot the model out for an appropriate time with proper data collection mechanisms so as to analyze the model in use and tweak or adjust accordingly. This could be led by Alberta Kidney Care, Alberta Health Services, and the Alberta Health Services Kidney – Strategic Clinical Network.
7. **Data collection and quality metrics**
    - A pan-Albertan data system is required that captures high quality data to measure quality indicators, and to drive continuous quality improvement initiatives.
    - Infrastructure development for a quality information system should include the costs of hiring and training data entry staff.
    - The Alberta Health Services Kidney – Strategic Clinical Network will work with Alberta Kidney Care and Alberta Health Services to implement a measurement system that can track quality indicators relevant to home dialysis use, and barriers to its use.

Abbreviations

ABF	activity-based funding
AHS	Alberta Health Services
BCPRA	British Columbia Provincial Renal Agency
CCAC	community care access centre
CKD	chronic kidney disease
CMS	Centers for Medicare & Medicaid Services
ESRD	end-stage renal disease
HD	hemodialysis
K-SCN	Kidney – Strategic Clinical Network
LTC	long-term care
MOHLTC	Ontario's Ministry of Health and Long-Term Care
NARP	Northern Alberta Renal Program
OACCAC	Ontario Association of Community Care Access Centres
ORN	Ontario Renal Network
PD	peritoneal dialysis
PPS	prospective payment system
QBP	quality-based program
RRMM	Renal Resource Management Model
SARP	Southern Alberta Renal Program
SCN	Strategic Clinical Network
SDM	Shared Decision Making

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Background: Current State

Dialysis Modalities: A Case for Home Therapies

Although there are both benefits and disadvantages of the greater adoption of home dialysis as an ideal modality for kidney failure treatment, participants generally agreed that the greater adoption of home therapies could help alleviate capacity pressures of in-centre hemodialysis (HD) units, as well reduce overall costs to the health system, while protecting patients overall quality of life while living with a chronic disease.

Dialysis space limitations pertaining to in-centre HD, along with incremental demand for use of services, has revealed a capacity issue that could be in part alleviated through the greater uptake of peritoneal dialysis (PD) and home HD. Recently, the Northern Alberta Renal Program announced that several of their in-centre HD sites would begin offering dialysis seven days a week (with patients receiving dialysis at different times of the day three days per week, rather than during a stable time slot as preferred by most patients), stating that, although currently operating at capacity, they "continue seeing an increase in dialysis patients to [their] program by six percent per year."[1] In their news release, they also articulate the importance of home therapies, such as home HD and PD, in easing pressure on in-centre sites.

In addition to easing pressures on limited space for in-centre HD, home therapies also cost less. Some studies have estimated in-centre HD costs to be approximately $100,000 per year; year one and two of home HD approximately $89,000 and $70,000, respectively; and PD approximately $56,000.[2] Other studies have estimated PD to cost on average approximately $20,000 to $25,000 per year less than in-centre HD.[3,4] This general cost difference is in part because PD has lower total component expenses than HD, as well as lower drug, staff, facility, infrastructure, and transportation costs. PD is, however, also argued to have higher supply costs.[5] A participant cautioned that an increase in PD use

[1] Alberta Health Services. Northern Alberta Renal Program offers seven-day dialysis [news release]. 2015 Feb 3 [cited 2015 May 1]. Available from: *http://www.albertahealthservices.ca/assets/news/rls/ne-rls-2015-02-03-extended-narp-hrs.pdf*.

[2] Klarenbach SW, Tonelli M, Chui B, Manns BJ. Economic evaluation of dialysis therapies. *Nat Rev Nephrol* 2014;10(11):644-652.

[3] US Renal Data System. Tables K.6 and K.7. In: *USRDS 2009 Annual data report: Atlas of end-stage renal disease in the United States*. Bethesda, MD: National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Disease; 2009. p. 739-740.

[4] Golper TA. The possible impact of the US prospective payment system ("bundle") on the growth of peritoneal dialysis. *Perit Dial Int* 2013;33(6):596-599.

[5] Pecoits-Filho R, Campos C, Cerdas-Calderon M, et al. Policies and health care financing issues for dialysis in Latin America: Extracts from the roundtable discussion on the economics of dialysis and chronic kidney disease. *Perit Dial Int* 2009;29 Suppl 2:S222-S226.

could correlate with an increase in human resource requirements, including staff training and patient training on the use of home therapies.

Nevertheless, it was agreed that the greater adoption of home-based therapies would ease long-term capacity and fiscal pressures and was ideal to the status quo. It was acknowledged that, once patients are established on in-centre HD, it is difficult to switch them to PD, and, as such, it is unlikely that home dialysis use can be increased enough in the short-term to allay current capacity issues within in-centre HD units.

Overview of Select Provincial Kidney Treatment Models

The following information was extracted from a backgrounder that was distributed to participants prior to the roundtable. Should you wish to read more details on any particular province or region discussed below, please see Appendix A.

Alberta

Kidney care in Alberta is currently funded through a global budget distributed by Alberta Health, and delivered by Alberta Health Services (AHS) through the Alberta Kidney Care program and its two regional operational units – the Northern Alberta Renal Program (NARP) and the Southern Alberta Renal Program (SARP). Patient care is delivered by NARP and SARPs, supported by the AHS Kidney – Strategic Clinical Network (K-SCN) and delivered in the AHS Zones. For the last several years, program budgets proceeded on a run-rate, rollover basis. Although funding methodology was structured to take the average of the two programs' submitted costs in order to determine funding allocation for the following year, it was largely frozen at 2009/10 levels, regardless of demographic and patient volume changes or changes in technology.[6] As a result, provincial budgets do not appropriately reflect growth in patient numbers,[7] and regional programs have realized annual budget overruns to meet needs. Given that these budget constraints are being felt in other sectors of health care in Alberta, identifying cost savings is imperative to the sustainability of Alberta's health care system (for more information on this model, see Appendix A, pages 10-11).

British Columbia

In British Columbia, funding for patients with kidney disease (both advanced chronic kidney disease [CKD] and end-stage renal disease [ESRD]) is provided by the Ministry of Health to the British Columbia Provincial Renal Agency (BCPRA), where it is then allotted to the five regional health authorities earmarked for the specific kidney programs, based on patient volumes. The BCPRA developed an activity-based funding (ABF) model in 2003/04, formally referred to as their "Renal Resource Management Model" (RRMM), and launched it

[6] Source: Alberta Health Services legacy information, which informed a Deloitte study on renal care.

[7] Source: Alberta Health Services legacy information, which informed a Deloitte study on renal care.

in 2004/05 under the belief that, among other incentives, the model would result in an increase in adoption of best practices, including home-based therapies. Prior to this, the agency was allocated an annual global budget based on historical patterns. There have been updates to the base model in 2008, 2011, and 2013 to account for changes in practice, new modalities, and recognized gaps.

The RRMM calculates the FTE requirements and corresponding labour costs for every element of care, for each category of care provider. The model then allocates funding based on projections of patient volume per new case, per patient year, and per discharge, further analyzed using an acuity assessment tool (for HD patients only) that measures stability on dialysis and other parameters (for more information on this model, see Appendix A, pages 12-14).

The BCPRA attributes the following gains, in full or in part, to their ABF model:[8]

- BCPRA and kidney care program partners are annually on budget and on target.
- Annual budget growth is lower than annual growth in kidney patients.
- Volume: 2012/13 - patient growth = 3.68%, budget growth = 3.48%;
  2011/12 - patient growth = 8.01%, budget growth = 6.73%.
- Improvement in mortality rates.
- Reduced rate of kidney replacement therapy for CKD patients.
- Increase in home-based therapy use by dialysis patients.
- Although up-coding can be a criticism of ABF, after the implementation of ABF in British Columbia, their budget growth was less than growth in patient numbers, suggesting that possible up-coding was minimal or non-existent.
- Incentives to promote continuum of care, and monies can be moved around within the program, allotted to the patient care activities.
- Full transparency and regular reporting permit early identification of issues within the system.

Criticisms of the ABF model included the following:

- Model does not adequately reflect all costs.
- Disagreement by some on elements included in fixed versus variable cost estimates.
- Model requires on-going validation and updating (note that elements in the model can be captured using the information system, and modifications can be made, including adjustments for changes in practice).

[8] Levin A, Lo C, Noel K, Djurdjev O, Amano EC. Activity-based funding model provides foundation for province-wide best practices in renal care. *Healthcare Quarterly* 2013;16(4):49-54.

- Data gathering and recording requirements for ABF model are not always feasible in all health care systems.

Ontario

As part of the government's quality agenda, the Ministry of Health and Long-Term Care (MOHLTC) launched a health system funding reform initiative. In 2010, the MOHLTC formally transferred responsibility for the delivery of kidney services to the Ontario Renal Network (ORN). The ORN has since implemented the CKD Quality-Based Program (QBP), linking health system performance, management, and planning with quality patient care. QBPs involve clusters of patients with clinically related diagnoses or treatments. Last year, funding for long-term care (LTC) and community care access centre (CCAC) support for PD patients was transferred from the MOHLTC to the ORN. The ORN directly funded LTC homes and CCACs in accordance with the existing MOHLTC funding formula. This year, the ORN, in close collaboration with the Ontario Association of Community Care Access Centres (OACCAC), CCACs, and LTC homes, has proposed refinements to the per diem rate for assisted PD within LTC and for the funding model for CCAC-supported assisted PD, to better reflect patient need and care time provided (for more information on this model, see Appendix A, pages 15-17).

Since the introduction of this program, the percentage of patients using home dialysis has increased by 1.5% over 3 years.[9]

United States

In 2011, the United States established a new payment system for Medicare patients through the Centers for Medicare & Medicaid Services (CMS) called the ESRD Prospective Payment System (ESRD PPS) (or the expanded ESRD bundle), switching from a composite rate (fee-for-service like model) into a bundled payment model for dialysis services that incorporates drugs and laboratory services.[10] Excluded from the bundle are physician services, which are reimbursed under a monthly capitation payment system.[11] Under the old fee-for-service like model, funding for dialysis treatment was argued to favour delivery of in-centre HD and discourage home dialysis, by making in-centre dialysis more profitable. Under the new model, home dialysis payment was set equal

> ***"The financial incentives created by CMS have probably been the stimulus for growth in home dialysis in general and in PD in particular."***
>
> **Thomas A. Golper (2013)**

[9] Ontario Renal Network [Internet]. Our progress so far. [cited 2015 May 1]. Available from: http://www.renalnetwork.on.ca/ontario_renal_plan/our_progress_so_far/#.VWkeSc9Viko

[10] Golper TA, Guest S, Glickman JD, Turk J, Pulliam JP. Home dialysis in the new USA bundled payment plan: Implications and impact. *Perit Dial Int* 2011;31(1):12-16.

[11] Chambers J, Weiner DE, Bliss SK, Neumann PJ. What can we learn from the U.S. expanded end-stage renal disease bundle? *Health Policy* 2013;110(2-3):166.

to in-centre treatment and reimbursement set for immediately upon home therapy administration.[12] Seeing as PD is approximately $20,000 per year cheaper than in-centre HD, PD becomes more profitable (for more information on this model, see Appendix A, page 18).

According to Nesrallah and Manns (2014), "a reversal was seen in the downward trend in PD use before implementation of this funding bundle in 2011. Between 2011 and 2013, there was a 15% increase in the number of patients on home dialysis among US dialysis providers, suggesting a strong link between profitability and modality distribution."[13]

According to Chambers et al. (2013), CMS' consultations with stakeholders throughout the structuring of this new bundle model were considered "instrumental" to its successful enactment.[14]

[12] Golper TA. The possible impact of the US prospective payment system ("bundle") on the growth of peritoneal dialysis. *Perit Dial Int* 2013;33(6):596-599.

[13] Nesrallah G, Manns B. Do socieoeconomic factors affect dialysis modality selection? *Clin J Am Soc Nephrol* 2014;9(5):837-839.

[14] Chambers J, Weiner DE, Bliss SK, Neumann PJ. What can we learn from the U.S. expanded end-stage renal disease bundle? *Health Policy* 2013;110(2-3):169.

Recommendations

Overview of Recommendations

Please note, this document summarizes key points and provides high-level recommendations arising from discussions, but **does not represent a consensus view**.

1. Funding model structure development and implementation

Participants made several suggestions for consideration in the structuring and reforming of Alberta's kidney care funding model. The benefits of and lessons learned from the kidney funding models in British Columbia, Ontario, Australia, and the United States were analyzed. British Columbia was identified by the Steering Committee and participants as a leadership model of interest in need of further reflection.

> ***"We should have appropriate provincial activity-based funding, which is centralized and which cannot be used for other acute care services, which is renal specific, dedicated to renal services."***
>
> **Roundtable participant**

It was reiterated that funding for kidney care should be within a predictable and protected envelope to allow for longer term planning. Since home dialysis is cost saving compared with in-centre HD, additional funding should be available to Alberta's kidney programs to meet the needs of the increasing numbers of patients treated with PD, and other forms of independent dialysis. Ultimately, providing kidney programs with stable funding would allow them the opportunity to innovate better. This recommendation was made in part in reflection of the BC Renal Agency model, where the organization receives a predictable and protected envelope of funding based on historical and actual data obtained through quality data collection of the application of their ABF model.[15] Through this approach, the BC Renal Agency has experienced an annual budget growth lower than the annual growth in the volume of kidney patients. For example, in 2011/12 patient growth was 8.01% and budget growth was 6.73%, whereas in 2012/13 patient growth was 3.68% and budget growth was 3.48%. The data collection mechanism integrated into the ABF model (PROMIS) is attributed to this model's success and provides a strong level of transparency in the model's implementation.

[15] The program received 26 biweekly payments based on the funding model and adjusted for actual patient volumes. For the first half of the year, payments are based on projections using a regression analysis of historical data. For the second half of the year, the projected and initially budgeted amounts are reconciled, and subsequent payments are adjusted as necessary to ensure adequacy of cash flow and to reflect actual patient volume. Levin A, Lo C, Noel K, Djurdjev O, Amano EC. Activity-based funding model provides foundation for province-wide best practices in renal care. *Healthcare Quarterly* 2013;16(4):49-54.

The funding structure should account for longitudinal and variable courses with complex patients, and medical administration leadership should be built into a kidney care funding model.

Also, patient "years" should be considered, not patient "numbers." Patient years take into account patient transitions within the year, including those who are exiting the program due to death or organ transplant. Transitions are counted and tracked, and patient years are calculated based on the number of patient months in a program or number of dialysis treatments.[16] This proposed approach is reflective of the BC Renal Agency model.

Incentives should be carefully structured so as to avoid unintended policy consequences (for instance, resources should not be directed to PD, if it inadvertently results in a reduction in transplant rates). Consideration should also be given to ensure that incentives for specific health care workers (e.g. physicians, specialists, nurses, social workers, dieticians) do not impact specific individual health care worker decisions, but instead provide an overall incentive to generally increase the uptake of the program.

Changes to the structure and implementation of new kidney care funding models should be led by Alberta Kidney Care in collaboration with AHS, and could be guided by input from the AHS K-SCN.

In order to set appropriate funding levels for bundles, a detailed costing study could be considered, in addition to consideration to historical funding levels.

2. Activity-based funding

Participants noted potential advantages of ABF, including: a stable, predictable, and protected funding envelope for kidney care reflecting the activity of a kidney care program; the ability to create financial incentives for home dialysis or other treatments prioritized by policy-makers, given their effectiveness and cost savings; and the ability for such a system to collect information on quality of care. Consideration would be required to determine what activity would be funded within the bundle, and what activity would be funded outside the bundle, including whether or not resources for pre-dialysis care, CKD-specific home care, and training costs be incorporated.

Drawing from past experience, several participants observed that, when structuring bundles in relation to funding patient care pathways for kidney treatment, to create an incentive for an activity, that activity should be withdrawn or separated from the bundle. Alternatively, to create cost control or a disincentive for an activity, that activity should be incorporated into the bundle. As one participant noted, "as the Americans discovered, you

[16] Levin A, Lo C, Noel K, Djurdjev O, Amano EC. Activity-based funding model provides foundation for province-wide best practices in renal care. *Healthcare Quarterly* 2013;16(4):49-54.

put EPO in a bundle - use falls very appropriately down. If you want people to put PD catheters and do fistulas, keep that out of the bundle."

In addition, bundles should be moderately fixed in what they encompass. They should not include too many items, so as to avoid the need to define a detailed standard of care for each item within the bundle.

To implement ABF, a provincial data collection system is required that captures high quality data using similar definitions across Alberta. This data could also be used to measure quality indicators, and to drive continuous quality improvement initiatives.

ABF may be an appropriate model to fund kidney care, but it appears less important than a protected envelope for kidney care that accurately reflects the number of people receiving dialysis in Alberta. If additional funding is required, the opportunity costs of that funding, in comparison to other uses of those resources, require consideration.

Again, changes to the structure and implementation of new kidney care funding models should be led by Alberta Kidney Care in collaboration with AHS, and could be guided by input from the AHS K-SCN.

3. Provider and patient engagement to increase use of home dialysis

Health professionals must remain current with best practices of care. Professional development (e.g. courses or programs) should therefore be offered to nephrologists, nurses, and/or hospital administrators on best practices for people with advanced CKD, including the use of PD. Once health professionals understand the opportunity costs of different modalities and are fully informed of developments in best practices, they are more likely to direct patient pathways in an informed and educated way that would enable the realization of savings and greater efficiency of care, as well as better overall health outcomes and treatment for patients. Current training for providers is largely supported by industry; if this support were to be withdrawn, there would be additional resource requirements and fiscal pressures created to fill this gap. A partnership could be established with universities, Alberta Kidney Care, and the AHS K-SCN to develop and implement professional development opportunities for providers.

Provider-patient decision support and educational programs should be created for patients for patients with advanced CKD to educate them on their treatment options. This should include some form of chronic disease clinic open to all interested, at-risk patients, and new patients under treatment.

The "Shared Decision Making" (SDM) model, tested at the University of Ottawa, was used as an example of a successful provider-patient collaboration. This shared system pilot was created to enable patients and providers to collaborate to make joint health care decisions by taking into account the best available empirical evidence, in conjunction with the patient's values, preferences, and individual circumstances.

The Ottawa study found that, after wholesome conversation, patients were more inclined to choose home dialysis over in-centre. This was attributed in part to the emphasis of lifestyle and travel freedoms that home therapies enable, which roundtable participants questioned might not be communicated as clearly to patients under traditional provider-patient settings.

A partnership could be established with universities and patient groups, led by the AHS K-SCN, to develop and implement both decision support and educational programs.

4. Reducing the impact of patient-borne costs for home dialysis

Transportation costs

Transportation costs serve as a costly barrier for patients for both in-centre and home-based therapies. When under in-centre HD, rural patients can be found travelling considerable lengths to get to and from in-centre units. There are higher costs, however, associated with running smaller rural community in-centre hemodialysis units over larger in-city units, due to fixed costs. One participant used Hanna, Alberta as an example. Providers discovered that it was cheaper to transport patients by taxi to kidney treatment facilities in Drumheller than it was to try to keep a small rural unit open. From a patient perspective, the distance one-way to Drumheller from Hanna is approximately 76.8 kilometres, or 46 minutes without traffic. Assuming a patient requires three to four treatments a week, patients from Hanna now travel between 23,962 and 32,010 kilometres a year, which amounts to nine to 13 days a year in transit to receive their in-centre treatment. In scenarios such as this one, the adoption of home-based therapies, where appropriate, would greatly alleviate the opportunity costs faced by both patients and providers.

> ***"Patient-borne costs represent the single most frequently raised issue by patients, family members, caregivers, health and allied health care providers."***
>
> **The Kidney Foundation of Canada (2014)**

Some provinces provide subsidies for these patients. Ontario, for example, has a Northern Health Travel Grant for Northern Ontario residents who must travel at least 100 kilometres one-way for medical specialist or designated health care facility services that are not locally available. This subsidy, however, is criticized for only assisting residents in Northern Ontario, and for having what could be considered a high threshold in distance requirements. Needless to say, the financial and opportunity costs of dialysis are burdensome, regardless of whether borne by the patients or by taxpayers.

PD and other home therapies can help eliminate these barriers in part, but transportation to and from training, as well as accommodation costs, can also prove to be a barrier in the further adoption of home therapies, though they are less costly than in-centre HD transportations costs. Training for home HD requires between six and eight weeks of training in a specialized facility, whereas PD training takes approximately one week.

Covering costs for training was identified by roundtable participants as a large barrier that government could subsidize, which would create a greater incentive to adopt home therapies for patients. Consideration could be given to folding this pressure into the ABF model bundle. Co-payment structures were also proposed during this roundtable as a plausible option worth consideration, should the cost to subsidize these expenses in full be unfeasible.

Electrical/water costs

Costs to patients and caregivers include, but are not limited to, unpaid leave or reduced paid working hours, gas and transportation costs, accommodation costs, hospital parking costs, and, depending on the modality chosen, electrical and water costs. For most patients, these costs are repeated several times a week, for many consecutive years. Although transportation costs are reduced in home therapies, patients who use a dialysis modality at home are facing increasing municipal and utility costs, the prospect of which could pose a barrier to the adoption of these modalities.

According to the Kidney Foundation of Canada, based on patient reports, patients experience the following increases in yearly municipal and utility expenses:[17]

- an increase of between $100 and $400 per year for electricity;
- an increase of between $500 and $700 per year for water for daily dialysis; and
- an increase of between $900 and $1,000 per year for water for nocturnal dialysis.

Rural patients also face additional costs related to ensuring they have a consistent supply of clean water.

Government could help subsidize some of these expenses to eliminate or reduce the disincentive to adopting home therapies due to utility expenses alone. Reflecting on the figures presented above, if a patient's increased utility expenses range from $600 to $1,400 annually, and the cost difference between home and in-centre modalities are estimated at minimum to be approximately $20,000 annually (for further details on estimated treatment price differences, please see page 1), the government could face savings of approximately $18,600 annually per patient (modest estimate) through the creation of this incentive.

The federal government currently offers a non-refundable tax credit that covers a portion of dialysis-related medical expenses under certain circumstances. This allotment, however,

[17] The Kidney Foundation of Canada. *Patient-borne costs: Briefing to the Ontario Renal Network, Spring 2014*. Mississauga, ON: The Kidney Foundation of Canada – Ontario Branch, Ontario Government Relations Committee; 2014. Available from: http://kidney.ca/document.doc?id=6582.

Please note that the Kidney Foundation of Canada is currently implementing a survey to gather updated information from dialysis patients on the financial burden of home therapies. The roll-out of the survey is planned for Fall 2015, with results being made public in Winter 2015/16.

does not cover expenses in their entirety, and can only be applied to those patients and/or caregivers receiving an income. For more information, please see the following link: *http://laws-lois.justice.gc.ca/eng/acts/I-3.3/section-118.2.html*.

Manitoba has recently become the first province to pay added water and electricity costs for dialysis patients who are approved for home therapies. The reimbursement program will be administered by the Manitoba Branch of the Kidney Foundation of Canada.[18]

Roundtable participants cautioned that the threshold should be set appropriately as not to incent inappropriate patient selection. This incentive could be limited to low socioeconomic status patients.

Further analysis on the costs and benefits of supporting patient-borne costs should be led by Alberta Health, in collaboration with Alberta Kidney Care and AHS.

Caregiver incentives

Caregivers are an integral part of a patient's care team and must accompany patients to appointments, training, and testing. These individuals must often take unpaid leave, and/or reduce the number of paid hours that they work a week. Also, they often absorb travel and relocation costs. Incentives could be established for family members to take care of their parent or partner at home rather than going to in-centre dialysis. This could relieve some opportunity costs faced by caregivers.

Remote monitoring/telehealth

Although not discussed at length at the roundtable, the Steering Committee briefly identified that consideration could be given to innovative practices in home dialysis, such as remote monitoring and telehealth, should it be noted as a relevant barrier to policy-makers in the future. It was felt that remote monitoring and telehealth could help create incentive for patient participation in-home modalities, as it could reduce the logistical burden on patients. If it is deemed a relevant barrier, AHS could lead in the promotion of greater access, uptake, and utilization of e-health in patient care.

5. Adjustments to operating room allotments

There is a disparity in wait times, depending on the type of insertion operation for differing dialysis treatments. One participant remarked, "I could pick up a telephone and get a central venous catheter put in that afternoon and have somebody on dialysis by the evening. I cannot do that for a PD catheter, no matter how good the communication is between the surgeons." This struggle is increased for out-patients. According to a roundtable participant, in-patients wait at least 24 to 48 hours before they are operated on,

[18] Owen B. "Manitoba government will cover utility bills for home dialysis patients." *Winnipeg Free Press*. 2015 Aug 20 [cited 2015 Aug 25]. Available from: *http://www.winnipegfreepress.com/local/Manitoba-government-will-cover-utility-bills-for-home-dialysis-patients-322419242.html*.

whereas out-patients may wait two to three weeks. This disparity results in a disincentive for patients and providers to choose certain treatments such as PD. Where it is an issue, wait times should be realigned for differing operating procedures to bring operations such as PD catheter insertion at par with more urgent operations such as in-hospital central venous catheter insertion, which would eliminate any disincentive to propose or adopt a home therapy.

Consideration should also be given to the role incentives ultimately play in operating room allocations and decisions. This analysis could be led by the AHS K-SCN.

6. Implementation considerations

In order to foster an environment conducive to a successful shift in funding methodology in kidney care, time for transition (a year was reiterated as an appropriate timeline), strong leadership, and clear objectives (what is and is not included) is needed. A stable funding envelope that increases with increasing volume of kidney care in Alberta, such as occurs in British Columbia and Ontario, should be made a top priority. If ABF were implemented, a provincial data collection system is required that captures high quality data using similar definitions across Alberta. Health policy-makers should pilot the model out for an appropriate time so as to analyze the model in use and tweak or adjust accordingly. This next step of analysis would assist in identifying and addressing any barriers, so that the model naturally evolves into a better system. A successful funding methodology requires a feedback mechanism that reports the outcomes including successes and barriers to clinical programs, along with benchmark reporting for the program, in order to enable cross-jurisdictional comparisons. This could be led by Alberta Kidney Care, the AHS K-SCN, and AHS.

7. Data collection and quality metrics

Data collection

Unsurprisingly, data access, collection, and quality were highlighted frequently by participants as areas of stagnation in need of further championing and development. A data system is required that captures high quality data to measure quality indicators and drive continuous quality improvement initiatives. The importance of a quality information system for monitoring and reporting, including hiring and training data entry staff, was reiterated. For policy-makers, knowing their local data and barriers to use of home dialysis was emphasized as being of considerable importance in order to ensure policies were both focused and evidence-based. Ensuring data and information are tabulated and presented in a helpful way is also important to doctors, as it would help increase physician awareness over their finances.

A participant attributed accuracy in data collection in British Columbia to a strong ABF model, articulating that every manager and clerk takes responsibility in entering data. Random auditing was attributed to assisting boost data quality.

The AHS K-SCN will work with Alberta Kidney Care and AHS to implement a measurement system that can track quality indicators relevant to home dialysis use, and barriers to its use.

Other data collection recommendations include the following:

- There is a need for consistent definitions. Some patients might be defined differently, depending on which database is being used. Metadata language needs to be both transparent as well as agreed upon. Conflicting definitions affects the overall quality of the data.
- The same system needs to be employed across Alberta.
- A clear understanding on how case mix and acuity are measured is needed.

Particular questions of interest to manage or identify barriers or issues include:

- What is the primary PD catheter failure rate?
- What is the 90-day dropout rate?
- What are the peritonitis rates?
- Why did patients drop out, if the dropout rate is high?

Quality metrics

The following quality metrics could be tracked:

- incident and prevalence rates
- reasons why patients do not select home dialysis
- reasons for modality failure, including caregiver burnout or infectious complications
- patient interest or choice in modality
- quality of life/care (patient satisfaction)
- caregiver perspective, including caregiver burden
- failure of home dialysis at six months
- complications of home dialysis
- wait times for starting on home dialysis therapies
- number of respite runs being utilized – precursor to a terminal event and prevent hospitalization, might extend home therapy
- appropriate use of pre-dialysis education

Conclusion

Funding models can play a significant role in driving health care decision-making, including the selection of different types of dialysis in people with advanced CKD. The way in which government chooses to structure these funding models to meet health care systems objectives must consider a diverse mix of strategies and funding levers, which may therefore vary considerably across jurisdictions.

> ***"I think that this notion of measuring and incentivizing activity and using funding levers is relevant across the system, not just within kidney care."***
>
> **Roundtable participant**

The *Innovative Funding Models: Kidney Care Policy Options for the Future* roundtable revealed that a successful kidney care funding model requires the provision of good data, adequate infrastructure, reasonable and predictable funding, and flexibility to accommodate for growth. If a provincial data collection system was available to track patient activity, ABF would be an alternative that could meet several of the objectives highlighted by participants. Participants were hopeful that recommendations from the roundtable will provide some win-win solutions that advance the adoption of home therapies for kidney care in Canada. Follow-up action to this report is imperative in order to fully realize potential savings through the adoption of more effective and efficient funding approaches. This action must be led by Alberta Health, AHS, Alberta Kidney Care, and the AHS K-SCN.

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Appendix A: Roundtable Backgrounder

The following is an excerpt of the Background Reading document distributed for the *Innovative Funding Models: Kidney Care Policy Options for the Future* roundtable.

INSTITUTE OF HEALTH ECONOMICS
ALBERTA CANADA

INNOVATIVE FUNDING MODELS

Kidney Care Policy Options for the Future

Roundtable Background Reading

The Institute of Health
Economics 1200-10405 Jasper
Avenue Edmonton, AB, T5J 3N4
Boardroom B

Please note: This background document is for use by participants in the round table and not for wider distribution. A summary report will be prepared in follow-up to the round table.

June 4, 2015

EXECUTIVE SUMMARY

Overview

The Institute of Health Economics (*www.ihe.ca*) will be holding a roundtable to identify and discuss key issues in kidney care policy options on June 4, 2015. This roundtable was supported, financially and/or in-kind, by Baxter Canada, the Alberta Health Services Kidney – Strategic Clinical Network (SCN) and Alberta Health.

Alberta has identified the need to look at new funding models to support enhanced quality, effectiveness and efficiency in health care delivery. Alberta has also made a commitment to focus on strategic and operational clinical networks within the province, and the Alberta Health Services Kidney – SCN has recently been launched. Early priorities for the Kidney – SCN include increasing the use of home dialysis, non-dialysis supportive care, and kidney transplantation. Funding models are not aligned with these priorities, and it is timely to examine and analyze different funding models within kidney care to: a) ensure consistent access to the most effective evidence-based therapies across the province, and to b) capitalize on new technologies which would support patients and care givers for greater independence.

> "An aging population, rising diabetes rates leading to renal failure, and patients living longer due to medical advancements are all factors contributing to increases in demand for dialysis service in Alberta."
>
> *-"Northern Alberta Renal Program Offers Seven-Day Dialysis" News release – February 3, 2015*

Recent reviews of the two provincial renal programs in Alberta have called for a) a consistent provincial renal funding envelope, and b) implementation of an activity-based funding model. There is also the need for establishing new funding models that would permit the implementation, assessment, and review of best practices, and would allow predictability of funding for this population of patients in the future.

The goal of this project is to inform and guide regional funding approaches for kidney care, while building on best practices and lessons from other jurisdictions. The roundtable will provide a shared learning experience involving key decision-makers/stakeholders in government, health service managers, clinical leaders, and industry to ensure key decision-makers are informed by latest evidence and best practice regarding optimal kidney care funding models. To ensure the scope of the project is manageable and consistent with the priorities of health care policy makers, this initiative will focus on funding models that encourage the use of home dialysis, a priority for Alberta Kidney Care.

The proceedings of the roundtable will inform the production of a report that will outline the opportunity, current environment, and support needed with targeted recommendations. The meeting will be held under the Chatham House rule, allowing ideas from the meeting to be used without attribution.

Project Objectives

- Inform and guide provincial funding approaches for kidney care, including the ability to increase the use of home dialysis, while building on best practices and lessons from other jurisdictions.

- Provide a shared learning experience with key decision-makers/stakeholders in government, health service managers, clinical leaders, and industry on the economic strategies to increase the use of home dialysis and the impact of home dialysis on clinical and economic outcomes.
- Identify key action steps and execution framework, while ensuring issues are raised to address funding reforms for kidney care to enable care to be delivered in the home.

Main Workshop Deliverable

Kidney Care Policy Options Report regarding the optimal funding approach for kidney care.

Funding Models Overview

Funding models play a significant role in driving decision-making, including the selection of treatments such as dialysis in people with chronic disease. The way in which government chooses to structure these models must incorporate a diverse mix of strategies and considerations, and therefore may vary considerably depending on the jurisdiction.

Alberta

Kidney care in Alberta is currently funded through a global budget distributed by Alberta Health, and delivered by Alberta Health Services through the Alberta Kidney Care program and its two regional operational units – the Northern Alberta Renal Program (NARP) and the Southern Alberta Renal Program (SARP). Patient care is delivered by NARP and SARPs, supported by the Kidney Strategic Clinical Network (K-SCN) and delivered in the AHS Zones. For the last several years, program budgets proceeded on a run-rate, roll over basis. Although funding methodology was structured to take the average of the two programs' submitted costs in order to determine funding allocation for the following year, it was largely frozen at 2009/2010 levels regardless of changes in demographic and technological factors.[1] As a result, provincial budgets do not appropriately reflect growth in patient numbers[2] and, regional programs have realized annual budget overruns to meet need. Given that these budget constraints are being felt in other sectors of health care in Alberta, identifying cost savings is imperative to the sustainability of Alberta's healthcare system (see page 10 for more information on this model).

British Columbia

In British Columbia, funding for patients with kidney disease (both CKD and ESRD included) is provided by the Provincial Ministry of Health to the British Columbia Provincial Renal Agency (BCPRA), where it is then allotted to the five regional health authorities earmarked for the specific renal programs, based on patient volumes. BCPRA developed an ABF model in 2003/04, formally referred to as their "Renal Resource Management Model" (RRMM), and launched it in 2004/05 under the belief that among other incentives, the model would result in an increase in adoption of best practices, including home-based therapies. Prior to this, the agency was allocated an annual global budget based on historical patterns. There have been updates to the base model in 2008, 2011 and 2013 to account for changes in practice, new modalities and recognized gaps.

The RRMM calculates the FTE requirements and corresponding labour costs for every element of care for each category of care provider. The model then allocates funding based on projections of patient volume per new case, per patient year, and per discharge – further analyzed using an acuity assessment tool (for hemodialysis patients only) which measures stability on dialysis and other parameters (see page 12 for more information on this model).

[1] Source: AHS legacy information which informed a Deloitte study on renal care.
[2] Source: AHS legacy information which informed a Deloitte study on renal care.

Ontario

As part of the government's quality agenda the Ministry of Health and Long-Term Care (MOHLTC) launched a health system funding reform initiative. In 2010 the MOHLTC formally transferred responsibility for the delivery of renal services to the Ontario Renal Network (ORN). The ORN has since implemented the Chronic Kidney Disease (CKD) Quality Based Program (QBP), linking health system performance, management and planning with quality patient care. QBPs involve clusters of patients with clinically related diagnoses or treatments. Last year, funding for LTC and CCAC support for PD patients was transferred from the MOHLTC to the ORN. The ORN directly funded LTC Homes and CCACs in accordance with the existing MOHLTC funding formula. This year, the ORN, in close collaboration with the Ontario Association of CCACs, CCACs, and LTC Homes, has proposed a refinement to the per diem rate for assisted PD within LTC, and the funding model for CCAC-supported assisted PD to better reflect patient need and care time provided (see page 15 for more information on this model).

United States

In 2011, the US established a new payment system for Medicare patients called the U.S End Stage Renal Disease (ESRD) Prospective Payment System (PPS) (or the expanded ESRD bundle), switching from a composite rate (fee for service like model) into a bundled payment model for dialysis services that incorporates drugs and laboratory services.[3] Excluded from the bundle is physician services, which is reimbursed under a monthly capitation payment system.[4] Under the old fee for service like model, funding for dialysis treatment was argued to favor delivery of in-center hemodialysis and discouraged home dialysis, by making in-center dialysis more profitable. Under the new model, home dialysis payment was set equal to in-center treatment and reimbursement set for immediately upon home therapy administration.[5] Seeing as peritoneal dialysis is approximately ~$20,000 per year cheaper than in-center hemodialysis, PD becomes more profitable (see page 18 for more information on this model).

[3] Golper, TA, Guest s, Glickman JD, Turk J, Pulliam JP, "Home Dialysis in the New USA Bundled Payment Plan: Implications and Impact."(2011) 31(1): 12-6.

[4] Chambers, James, Weiner DE, Bliss SK, Neumann PJ, "What can we learn from the U.S. expanded end-stage renal disease bundle?" (2013), 110(2-3): 166.

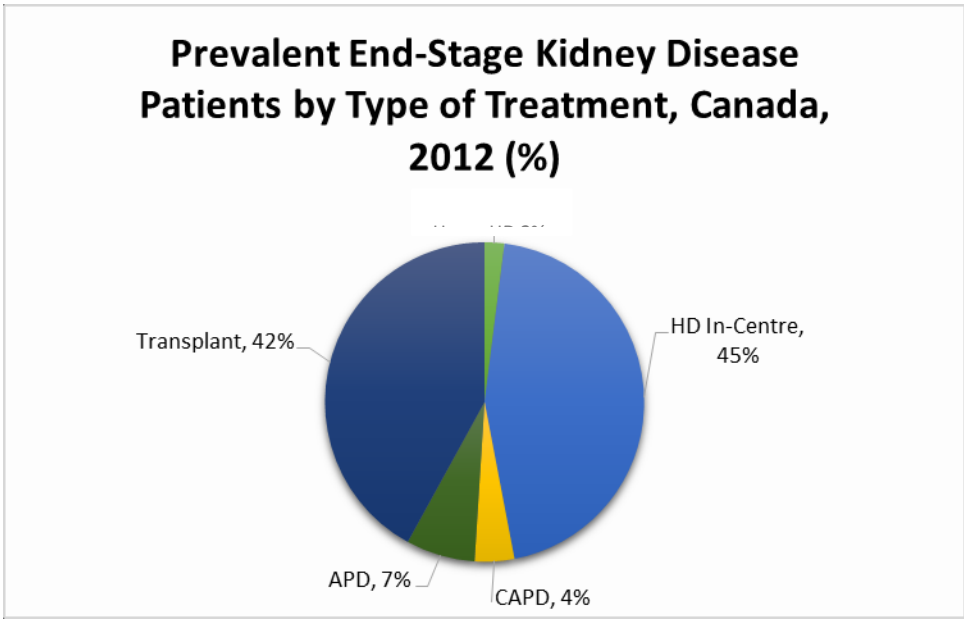
[5] Golper, Thomas A., "The Possible Impact of the US Prospective Payment System ("Bundle") on the growth of peritoneal dialysis" (2013) 33(6): 596-599.

Background Information

Renal Replacement Therapy in Alberta: Current State and Cost

In 2012, 41,252 individuals in Canada were receiving renal replacement therapies: 42% were treated by transplantation and 58% were treated through dialysis (see Figure A).[6] Ninety days after dialysis initiation, 19.8% to 36.1% of patients are treated with peritoneal dialysis, depending on the province. In comparison, Hong Kong and the United States peritoneal dialysis rates vary as widely as 74% and 7.4%, respectively.[7]

FIGURE A: PREVALENT END-STAGE KIDNEY DISEASE PATIENTS BY TYPE OF TREATMENT, CANADA, 2012 (%)



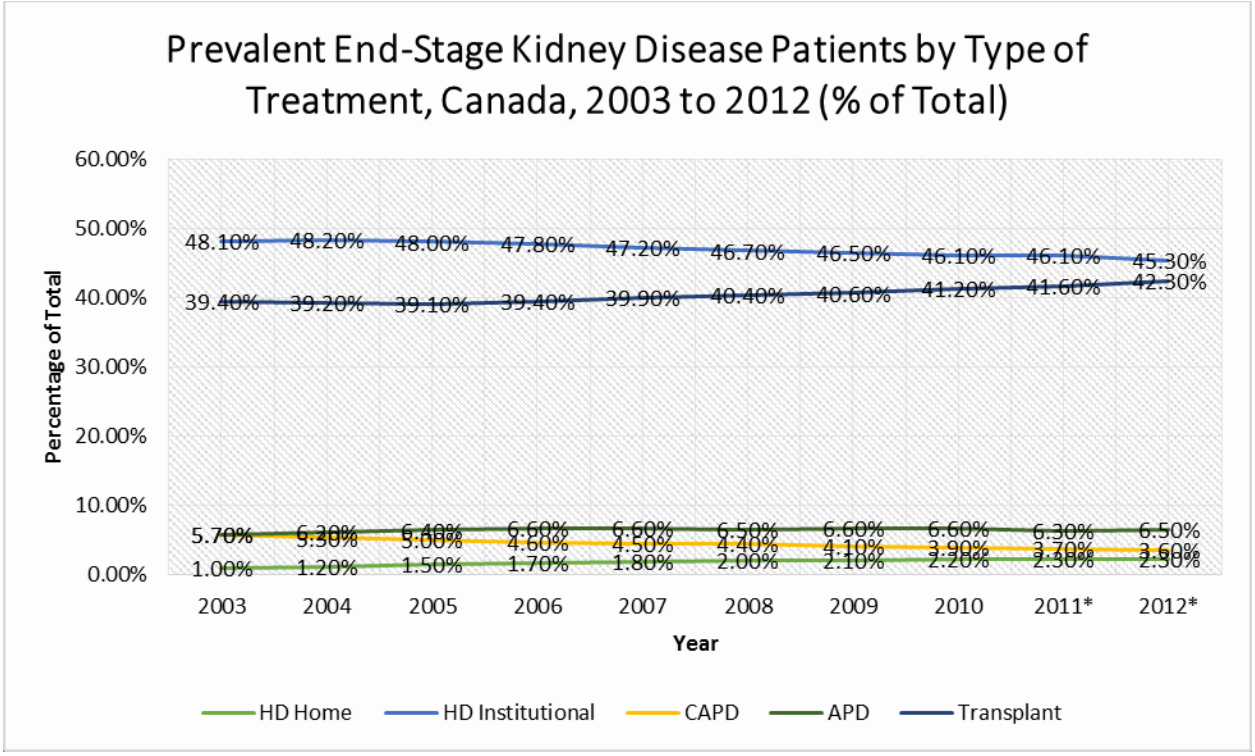
*Data extracted from Canadian Organ Replacement Registry, 2013, Canadian Institute for Health Information
APD - automatic peritoneal dialysis; CAPD - continuous ambulatory peritoneal dialysis; HD - hemodialysis

Since 2003, dialysis rates and modality choice have demonstrated minimal variability. The prevalance of transplants has increased by almost 3% as hemodialysis decreased by approximately the same amount. There was also a modest rise in automatic peritoneal dialysis (APD) and in-center hemodialysis, and a modest drop in continuous ambulatory peritoneal dialysis (CAPD) (see Figure B for more information).

Importantly, the lower use of peritoneal dialysis is not because of worse clinical outcomes. While no large randomized trials have been completed, most observational studies suggest equal or improved survival (at least in the initial years of treatment) in comparison to hemodialysis, and similar or improved quality of life for those who choose peritoneal dialysis.

[6] The Kidney Foundation of Canada, "Facing the Facts," extracted May 1st, 2015 from *http://www.kidney.ca/facing-the-facts*.
[7] Nesrallah, Gihad, Manns, Braden, "Do socieoeconomic factors affect dialysis modality selection?" (2014) 9(5): 837-839.

FIGURE B: PREVALENT END-STAGE KIDNEY DISEASE PATIENTS BY TYPE OF TREATMENT, CANADA, 2003 TO 2012 (% OF TOTAL)



*Data extracted from Canadian Organ Replacement Registry, 2013, Canadian Institute for Health Information
APD - automatic peritoneal dialysis; CAPD - continuous ambulatory peritoneal dialysis; HD - hemodialysis

Cost

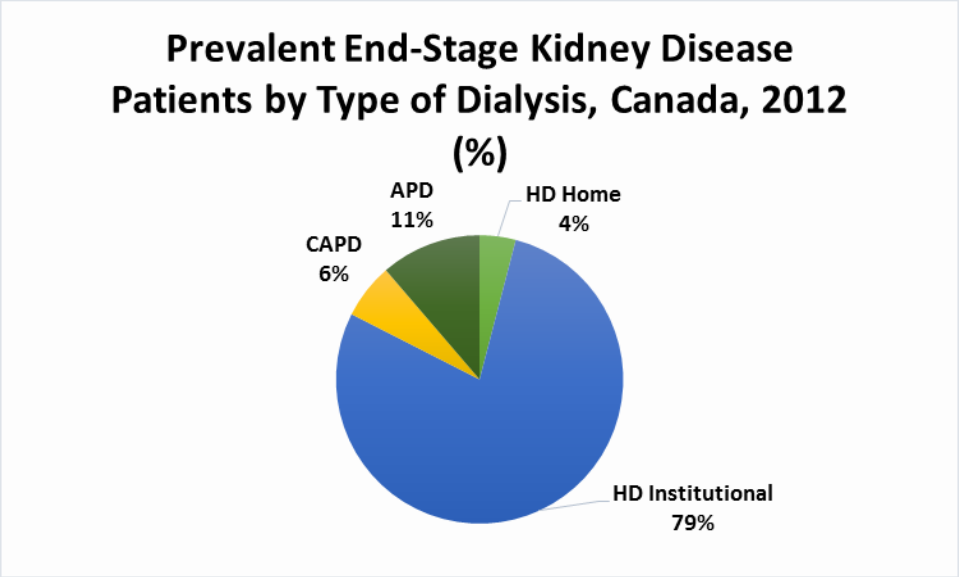
In a world of ever increasing austerity measures, costs matter. The average cost of a kidney transplant in Canada is $120,000, plus $22,500 per year for required annual follow-ups and medications. The average cost for dialysis is $70,000-$100,000 per year.[8] Although more expensive at the onset, kidney transplants improve outcomes and reduce costs over time. However, the scarcity of organs means that the vast majority of patients are treated with dialysis. Dialysis is therefore a common therapy used by many patients, and consideration of the different costs associated with different forms of dialysis is increasingly important in decisions around health funding allocations.

> "The future with constantly **increasing numbers of patients** and **growing cost constraints** will force all providers to make the **best use of their resources** by also offering **home therapies** such as PD to patients."
>
> - De Vecchi, et. al.,1999

Of the 17,438 Canadians treated through dialysis in 2012, 79% were treated with in-center hemodialysis, versus 21% by home-based therapies such as CAPD, APD, and home hemodialysis (see Figure C).

[8] The Kidney Foundation of Canada, "Facing the Facts," extracted May 1st, 2015 from *http://www.kidney.ca/facing-the-facts*.

FIGURE C: PREVALENT END-STAGE KIDNEY DISEASE PATIENTS BY TYPE OF DIALYSIS IN CANADA (2012)

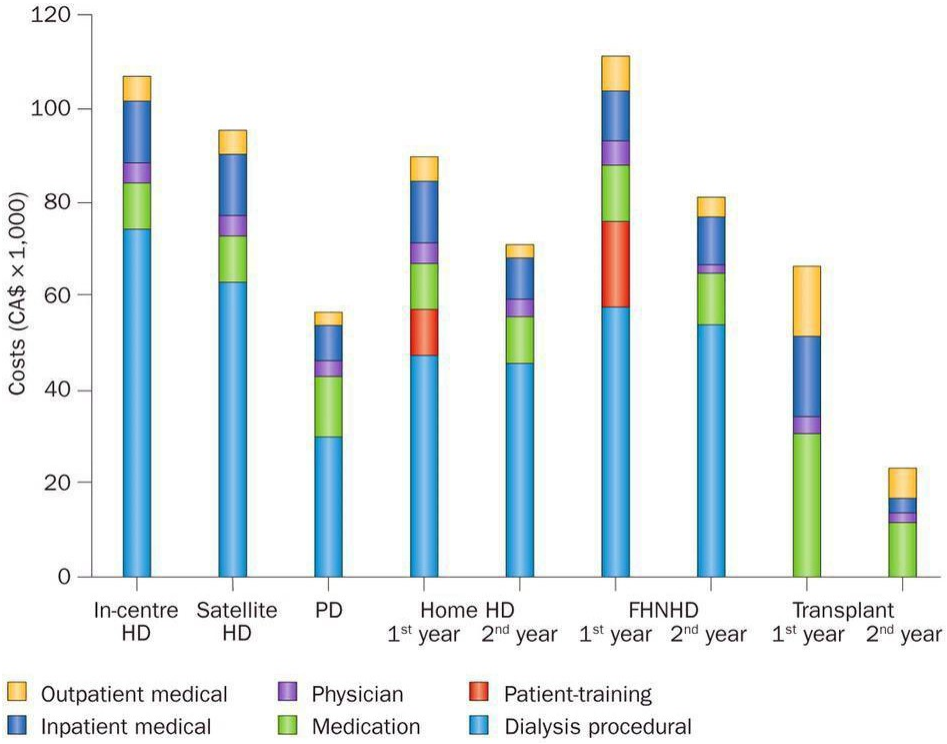


*Data extracted from Canadian Organ Replacement Registry, 2013, Canadian Institute for Health Information
APD - automatic peritoneal dialysis; CAPD - continuous ambulatory peritoneal dialysis; HD - hemodialysis

The cost differences in these modalities vary considerably (see Figure D below). In-center hemodialysis costs approximately $100,000/year; year one and two of home hemodialysis costs approximately $89,000 and $70,000, respectively; and, peritoneal dialysis costs approximately $56,000. An international review found that "nearly two CAPD patients can be treated for one hospital HD patient."[9]

[9] De Vecchi AF, Dratwa M, Wiedemann ME, "Healthcare systems and end-stage renal disease (ESRD) therapies – an international review: costs and reimbursement/funding of ESRD therapies." (1999) 14 Suppl 6: 31-41.

FIGURE D: ANNUAL HEALTH CARE COSTS OF DIALYSIS BY MODALITY (2012 CAD)



*Graph extracted from Klarenbach SW, Tonelli M, Chui B, Manns BJ. Economic evaluation of dialysis therapies. *Nat Rev Nephrol.* 2014 Nov;10(11):644-652

FHNHD - frequent home nocturnal hemodialysis ; HD – hemodialysis; PD - peritoneal dialysis

Peritoneal dialysis is estimated to cost on average approximately $20,000 to $25,000 per year less than in-center hemodialysis.[10,11] This is in part because peritoneal dialysis has lower total component expenses than hemodialysis, as well as lower drug, staff, facility, infrastructure, and transportation costs. It is, however, also argued to have higher supply costs.[12]

As budgets pressures and patient volumes increase, policy makers are on a constant battle to find cost-saving measures. The greater use of home dialysis, and even more specifically peritoneal dialysis, has become an attractive modality to promote, both internationally and in Canada.

[10] US Renal Data System. Tables K.6 and K.7. In: USRDS 2009 Annual Data Report: Atlas of End-Stage Renal Disease in the United States. Bethesda, MD: National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Disease; 2009; 739,740.

[11] Golper, Thomas A., "The Possible Impact of the US Prospective Payment System ("Bundle") on the growth of peritoneal dialysis" (2013) 33(6): 596-599.

[12] Pecoits-Filho R., Campos C, Cerdas-Calderon M, et. Al. "Policies and Health Care financing issues for dialysis in Latin America: Extracts from the roundtable discussion on the economics of dialysis and chronic kidney disease." (2009) 29 Suppl 2: S222-6.

Funding Models in Canada and Abroad

Types of Funding Models – Brief Overview[13]

Population-Based Funding:

- Based on demographic and health care utilization data.
- Equitable and strengthens regional autonomy.
- Limited by difficulties in accurately measuring the population's health and need for health care.

Global Budgets:

- Most common funding method. Fixed amount of funding distributed to health care provider.
- Control expenditure through use of a "cap".
- Providers may restrict access to services to remain on budget.

Fee-For-Service (FFS):

- Is a payment model where services are paid for unbundled, per individual service.
- FFS arguably increases the incentive for supplier-induced demand (SID), by encouraging an unnecessary increase in consumption of health services in order to optimize their utility.

Pay-for-Performance:

- Remunerates based on meeting certain set targets in care, quality, or safety.
- There is limited evidence that supports this model as increasing quality of care.

Activity-Based Funding:

- Payments for a set of services for an episode of care that follows the patient across providers and settings.
- Can create financial incentive for providers to adjust modality choice.

Activity-Based Funding - Detailed

Activity-based funding (ABF) may also be referenced as patient-based funding, prospective payment system (in the U.S.), payment-by-result (in the U.K.), volume-based funding, service-based funding, case-mix funding, or payment by result. The model uses an episode-based case mix system, a classification system that bundles patient care episodes into clinically homogeneous groups, to carve out anticipated costs of healthcare services for comparable diagnoses that use a comparable consumption of health care resources. When ABF is used within hospital care, the most popular case-mix systems are called diagnosis-related groups (DRGs). By comparing costs of all episodes in one DRG to the average of all episodes across all DRGs, one is then able to determine the relative measure of resource use for each episode of care, or cost weight. This relative measure for each episode is a reliable comparator of resource use, and is helpful in decision-making.

[13] Sutherland, Jason, Repin, Nadya, Crump, R. Trafford, "Reviewing the Potential Roles of Financial Incentives for Funding Healthcare in Canada." Canadian Foundation for Healthcare Improvement (December 2012), extracted May 1st, 2015 from *http://www.cfhi-fcass.ca/Libraries/Reports/Reviewing-Financial-Incentives-Sutherland-E.sflb.ashx*

The Case Mix Groups+ (CMG+) methodology is Canada's version of a DRG system, and is maintained by the Canadian Institute of Health Information (CIHI). It uses aggregate acute care inpatient data (including information on age group, comorbidity level, and intervention event) to help policy makers in planning and evaluating programs, analyzing physician impact, and developing benchmarks.

Below are some benefits and criticisms of ABF in an inpatient setting. The analysis on individual provincial and international funding models following this section will analyze ABF on outpatient care.

Benefits of ABF:[14]

- Creates financial incentives for hospitals to increase activity levels.
- Motivates hospitals to change their mix of labour and non-labour inputs to the most cost-efficient combination.
- Mitigates cream skimming because the level of funding is adjusted to reflect patients' levels of clinical complexity.

Criticisms of ABF:[15]

- The tendency for health care providers to provide services with the highest margins.
- The creation of financial incentives around increasing volume and providing unnecessary care.
- Increases in the overall cost of care to the health care system due to increased volume of care.
- The adoption of ABF might correlate with an increase in post-acute care readmissions.[16]

Analysis of Criticisms:

- Ensuring policies are patient-focused is important. Quality of care delivery must take precedence over financial incentives and gains.[17]

[14] UBC Centre for Health Services and Policy Research, "Activity-Based Funding (ABF) Hospital Funding Models for Canadian Provinces" (March 2014). Extracted May 1st, 2015 from *http://healthcarefunding2.sites.olt.ubc.ca/files/2014/03/White-Paper-ABF.pdf*.

[15] UBC Centre for Health Services and Policy Research, "Activity-Based Funding (ABF) Hospital Funding Models for Canadian Provinces" (March 2014). Extracted May 1st, 2015 from *http://healthcarefunding2.sites.olt.ubc.ca/files/2014/03/White-Paper-ABF.pdf*.

[16] Palmer, Karen, Agoritsas, Thomas, et al. "Activity-Based Funding of Hospitals and Its Impact on Mortality, Readmission, Discharge Destination, Severity of Illness, and Volume of Care; A Systematic Review and Meta-Analysis," Oct 2014, vol 9, issue 10, e109975.

[17] Golper, TA, Sexena AB, Piraino B., et. al. "Systematic Barriers to the effective delivery of home dialysis in the United States: A report from the public policy/advocacy committee of the North American Chapter of the International Society of Peritoneal Dialysis" (2011) 58(6): 879-85.

Alberta's Kidney Care Structure: NARP and SARP

> "Supporters of having funding 'follow the patient' say it provides an incentive for hospitals to be more productive and more efficient. Critics of activity-base funding say it will lead to hospitals that focus on increasing patient volume instead of bettering care, and that this will cause hospitals to favour simple cases over complex, time-consuming cases."
>
> *– Roger Collier, CMAJ "For the Record" (2009)*

Kidney care in Alberta is currently funded through a global budget distributed by Alberta Health, and delivered by Alberta Health Services through the Alberta Kidney Care program and its two regional operational units – the Northern Alberta Renal Program (NARP) and the Southern Alberta Renal Program (SARP). Patient care is delivered by NARP and SARPs, supported by the Kidney Strategic Clinical Network (K-SCN) and delivered in the AHS Zones. NARP and SARP handle the assessment, treatment, and follow-up for patients with end stage renal disease (ESRD). They are closely linked, both internally and with external agencies such as the Alberta Kidney Disease Network and the Kidney Foundation of Canada.

For the last several years, program budgets have proceeded on a run-rate, roll-over basis. Although funding methodology was structured to take the average of the two programs' submitted costs in order to determine funding allocation for the following year, it was largely frozen at 2009-10 levels, regardless of changes in demographic and technological factors.[18] As a result, provincial budgets do not appropriately reflect growth in patient numbers,[19] and regional programs have realized annual budget overruns to meet need. According to Alberta Health Services, "current growth in this population (ESRD) has outstripped growth in resource allocations and will continue to do so at a faster rate in the future unless solutions are defined."[20] Tables A and B describe the aforementioned workload and budget variances from 2008-09 to 2011-12.

TABLE A: WORKLOAD AND BUDGET VARIANCES FROM 2008/09-2011/12, NARP

NARP	2008	2009	2010	2011	Percent Change 2008/09 to 2011/12
NARP Budget (Fiscal Year)	66,175,426	66,259,951	61,168,815	62,292,935	-6%
Total HD Runs	122,844	122,036	128,615	136,793	11%
Total PD Runs	51,840	53,107	58,253	60,658	17%
Visits	24,226	25,557	27,818	27,940	15%
Renal Transplants	90	82	105	101	12%

*extracted from Provincial Renal Programs NARP/SARP 2012/2013 Business Case, AHS. Pg 14

HD – hemodialysis; PD - peritoneal dialysis

[18] Source: AHS legacy information which informed a Deloitte study on renal care.
[19] Source: AHS legacy information which informed a Deloitte study on renal care.
[20] Source: AHS legacy information which informed a Deloitte study on renal care.

TABLE B: WORKLOAD AND BUDGET VARIANCES FROM 2008/09-2011/12, SARP

SARP	2008	2009	2010	2011	Percent Change 2008/09 to 2011/12
Combined Budget SARP & ALTRA	70,239,354	72,952,706	64,067,570		-7%
Actuals			65,350,900	69,228,579	
Total HD Runs	111,757	119,177	123,001	125,389	12.20%
Total PD Runs	60,466	69,760	75,875	84,733	40.10%
Total Direct Clinic Visits	13,512	14,974	15,034	16,471	21.90%
Total Indirect Clinic Visits	12,318	15,687	17,944	21,221	72.20%
Total Direct Clinic Visits - ALTRA	6,054	5,940	6,445	6,640	9.60%
Total Indirect Clinic Visits - ALTRA	11,109	13,724	13,741	12,392	11.50%

* extracted from Provincial Renal Programs NARP/SARP 2012/2013 Business Case, AHS. Pg 15
ALTRA - Southern Alberta transplant program; HD – hemodialysis; PD - peritoneal dialysis

Last year, both NARP and SARP were each provided with $6.5 million to wipe out their deficits. Although allocated a global budget, additional funding pressures such as various savings initiatives in both Calgary and Edmonton led to budget and staffing modifications and eliminations to meet assigned targets. Included under NARP and SARP budgets are inpatient units with high renal patient density, transplant patients (in SARP), care providers including (with some exceptions) social workers, and renal technicians (in SARP, not NARP). Pharmacists and outpatient drugs are not included in SARP and NARP budgets.

Until just recently, Alberta renal programs would compete with other hospital units for capital funding. They now expect to receive $250,000 annually to cover capital costs. Unfortunately, this allocation does not always cover the full cost of the equipment required, and NARP and SARP must pool their funding and alternate projects in their respective jurisdictions to ensure they can cover the full costs of their individual equipment needs. On top of these pressures, NARP and SARP use the same financial programs, but implementation of financial directives are not always consistent, making evidence-based policy analysis and benchmarking more difficult.

More recently, NARP announced that several sites would begin offering dialysis seven days a week, stating that although currently operating at capacity, they "continue seeing an increase in dialysis patients to our program by six percent per year."[21] In their news release, they also argue the importance of home therapies, such as home hemodialysis and peritoneal dialysis, in easing pressure on in-center sites.

[21] Alberta Health Services, "Northern Alberta Renal Program offers seven-day dialysis," News Release, (February 3, 2015). extracted May 1st from *http://www.albertahealthservices.ca/assets/news/rls/ne-rls-2015-02-03-extended-narp-hrs.pdf*.

British Columbia's Experience

The British Columbia Provincial Renal Agency (BCPRA) – System Overview

In British Columbia, funding for patients with kidney disease (both chronic kidney disease (CKD) and ESRD included) is provided by the Provincial Ministry of Health to the British Columbia Provincial Renal Agency (BCPRA), where it is then allotted to the five regional health authorities, earmarked for the specific renal programs, based on patient volumes. Patient volumes are calculated in patient years, and are projected based on historical trends and other assumptions. In turn, BCPRA is accountable to the Provincial Health Services Authority and the Ministry of Health for both the annual budget for kidney care and the health outcomes of kidney care patients in the province.[22]

BCPRA developed an ABF model in 2003/04 and launched it in 2004/05 under the belief that, among other incentives, the model would result in an increase in adoption of best practices, including home-based therapies. Prior to this, the agency was allocated an annual global budget based on historical patterns. There have been updates to the base model in 2008, 2011, and 2013 to account for changes in practice, new modalities, and recognized gaps.

TABLE C: BCPRA – FUNDING MODEL MIX

Funding flow	What is being funded	Funding mechanism used	Considerations given in calculations of note
BCPRA to in-center and community dialysis units	Service-related labour costs	FF: base annual funding: in-center - $226,238 community - $76,593	Housekeeping, laundry, and general maintenance.
BCPRA to individual health authorities	Provincial independent dialysis programs (home hemodialysis and peritoneal dialysis)	FF: $150,000 per health authority	Funding to support patient support, education, training, wait list management, enhancement of peritoneal dialysis in residential care settings, and home visits.
BCPRA to health authority renal programs	Individual health authority renal programs.	ABF: 26 biweekly payments based ABF and adjusted for actual patient volumes	1st 6 months – projections based on regression models and summation from last 3 years 2nd 6 months – budgeted amounts reconciled and adjusted to reflect actual patient volumes

FF - fixed funding; ABF- activity based funding

Additional variable costs

BCPRA covers some facility leases, in-center and community dialysis supplies, home hemodialysis and peritoneal equipment, and certain medications and nutritional supplements. Additional funding is also provided for each program for vascular access activities, pharmacy services, data monitoring, and data entry into BCPRA's patient data management system.

[22] Levin, Adeera, Clifford Lo, Kevin Noel, Ogjnenka Djurdjev, Erlyn C. Amano, "Activity-Based Funding Model Provides Foundation for Province-Wide Best Practices in Renal Care." Healthcare Quarterly, (2013) 16(4):50

Not covered under BCPRA

- Management and corporate overhead
- Procedures for chronic patients
- Compensation lifts
- Patient transport

Details of BCPRA Activity-Based Model

BCPRA's ABF model, formally referred to as their "Renal Resource Management Model" (RRMM), calculates the FTE requirements and corresponding labour costs for every element of care for each category of care provider. More specifically, the model describes each care activity, identifies staff needed to complete the activity, estimates time required for completion, defines frequency of activity, and estimates probability of the activity being required. The model then allocates funding based on projections of patient volume per new case, per patient year, and per discharge, further analyzed using an acuity assessment tool (for hemodialysis patients only) that measures stability on dialysis and other parameters.

Gains from the ABF model

BCPRA attributes the following gains, in full or in part, to their ABF model:

> "**Since the introduction of ABF, the number of dialysis patients on home-based therapy has grown** from 27% to 32% - among the highest rates in the country – and conservative care options are now selected by 15% of patients receiving CKD care."
>
> *– Levin, 2013*

- BCPRA and kidney care program partners are annually on budget and on target.
- Annual budget growth lower than annual growth in renal patients volume: 2012/13 - patient growth = 3.68%, budget growth = 3.48%; 2011/12 - patient growth = 8.01%, budget growth = 6.73%.
- Improvement in mortality rates.
- Reduced rate of renal replacement therapy for CKD patients.
- Increase in home-based therapy use by dialysis patients.
- Although up-coding can be a criticism of ABF, after the implementation of ABF in British Columbia, their budget growth was less than growth in patient numbers, suggesting that possible up-coding was minimal or non-existent.
- Incentives to promote continuum of care, and monies can be moved around within the program, allotted to the patient care activities.
- Full transparency and regular reporting permit early identification of issues within the system.

Criticisms of the ABF model

- Model does not adequately reflect all costs.

- Disagreement by some on elements included in fixed versus variable cost estimates.
- Model requires on-going validation and updating (note that elements in the model can be captured using the information system, and modifications can be made, including adjustments for changes in practice).
- Data gathering and recording requirements for ABF model not always feasible in all health care systems (as per above).

Ontario's Experience

As part of the government's quality agenda, Ontario's Ministry of Health and Long-Term Care (MOHLTC) launched a Health System Funding Reform initiative. In 2010, the MOHLTC formally transferred responsibility for the delivery of renal services to the Ontario Renal Network (ORN). The ORN has since implemented the Chronic Kidney Disease (CKD) Quality Based Program (QBP), linking health system performance, management, and planning with quality patient care. QBPs involve clusters of patients with clinically-related diagnoses or treatments. CKD was chosen as a QBP using an evidence and quality-based selection framework that identifies opportunities for process improvements, clinical re-design, improved patient outcomes, and enhanced patient experience and potential cost savings.

Through the cooperation and efforts of all dialysis providers in Ontario, the ORN has established a database of all pre-dialysis, acute dialysis, and chronic dialysis patients in Ontario, the Ontario Renal Reporting System (ORRS). ORRS captures comparable data from all CKD providers, and helps to inform the CKD QBP and the data set used for funding. These data are essential to improve system quality, performance, planning and funding allocation.

High-level Timeline

- In **2012/13**, the ORN funded over 30 unbundled CKD services, and introduced four home bundles (Home APD, Home CAPD, Home HD Daily Nocturnal, Home HD Conventional).
- In **2013/14,** three additional bundles were introduced (Pre-dialysis; Chronic in-facility HD Daily/Nocturnal; Chronic in-facility HD Conventional). Patients continued to receive a number of unbundled services, which were reimbursed on a fee-for-service basis.
- In **2014/15**, CKD became the first QBP to expand along the continuum of care by incorporating funding for the provision of assisted peritoneal dialysis by Community Care Access Centres (CCAC) and in Long Term Care (LTC) Homes. Since the introduction of this program, the percentage of patients using home dialysis has increased by 1.5% over 3 years.[23]
- In **March 2015**, the ORN launched the second Ontario Renal Plan.[24] Included in the plan is a community-first approach to CKD, and the further development of the CKD patient-based integrated funding model.

The Ontario Renal Network (ORN) developed the CKD patient-based funding model, which consists of a Hospital-Based Model and an Assisted Peritoneal Dialysis Model.

Hospital-Based Funding Model

Consists of 2 parts:

1. Patient-Based – Bundled Services
2. Service-Based Funding (fee-for-service)

[23] Ontario Renal Network "Our Progress So far" *www.renalnetwork.on.ca*. extracted May 1st, 2015 from *http://www.renalnetwork.on.ca/ontario_renal_plan/our_progress_so_far/#.VWkeSc9Viko*

[24] Ontario Renal Network, "Ontario Renal Plan (2015-2019)." www.renalnetwork.on.ca. Extracted May 1st, 2015 from *http://www.renalnetwork.on.ca/cms/One.aspx?portalId=256223&pageId=256246#.VV3R_03bLIU* .

Patient-based bundles

TABLE D: PATIENT-BASED PAYMENT BUNDLES

Bundle Type	Services Included
Bundle A – Pre-dialysis	Pre-dialysis clinic visit
Bundle B.1 – APD	Maintenance APD Peritoneal Equilibrium Test Assessment of Dialysis Adequacy/Kinetic Modeling Follow-up Clinic Visit for Home PD Patient
Bundle B.2 – CAPD	Maintenance CAPD Patient Peritoneal Equilibrium Test Assessment of Dialysis Adequacy/Kinetic Modelling Follow-up Clinic Visit for Home PD Patient
Bundle C – home hemodialysis – daily/nocturnal	Home HD Initial Training Home HD Maintenance Follow-up Clinic Visit for Home PD Patient Bacteria Test LAL Test Chlorine Test
Bundle D – home hemodialysis – conventional	Home HD Initial Training Home HD Maintenance Follow-up Clinic Visit for Home PD Patient Bacteria Test LAL Test Chlorine Test
Bundle E – Chronic In-Facility or Satellite HD daily/nocturnal	Daily Hemodialysis Treatments or Nocturnal Hemodialysis Treatments
Bundle F – Chronic In-Facility or Satellite HD conventional	Conventional Hemodialysis Treatments

APD - automatic peritoneal dialysis; CAPD - continuous ambulatory peritoneal dialysis; HD – hemodialysis; LAL-endotoxin testing ;PD - peritoneal dialysis

Service-Based (unbundled, fee-for-service)

Services are unbundled due to variability across providers and unpredictability of the service. Unbundled services include, as examples:

- home visit nursing hours of service
- home visit technician hours of service
- nephrology clinic visit
- education clinic visit
- central venous catheter – untunneled insertion

- acute hemodialysis level III
- arterio-venous fistula insertion
- AV graft insertion

Assisted Peritoneal Dialysis Model

With the support of the ORN's Community Care Access Centres (CCAC) and LTC Working Groups, as well as other expert panels, the ORN developed interim funding models that aim to reduce the care gap that currently exists for assisted peritoneal dialysis patients to improve access to quality care for peritoneal dialysis patients. The goals of the models are to:

1. Increase equitable access to assisted peritoneal dialysis.
2. Integrate care to improve quality.
3. Generate evidence for good outcomes.

Last year, funding for LTC and CCAC support for PD patients was transferred from the MOHLTC to the ORN. The ORN directly funded LTC Homes and CCACs in accordance with the existing MOHLTC funding formula. This year, the ORN, in close collaboration with the Ontario Association of CCACs, CCACs, and LTC Homes, has proposed a refinement to the per diem rate for assisted PD within LTC, and the funding model for CCAC-supported assisted PD to better reflect patient need and care time provided.

United States

In 2011, the United States established a new payment system for Medicare patients through the Centers for Medicare & Medicaid Services (CMS) called the U.S End Stage Renal Disease (ESRD) Prospective Payment System (PPS) (or the expanded ESRD bundle), switching from a composite rate (fee-for-service-like model) into a bundled payment model for dialysis services that incorporates dugs and laboratory services.[25] Excluded from the bundle are physician services, which are reimbursed under a monthly capitation payment system.[26] The appeal of this funding methodology stems from the understanding that, under a bundled payment system, payers and providers share the risks in treating patients.[27] The bundle has been criticized, however, for failing to shift risk to providers for managing post-episode care.[28]

With regard to modality choice, under the old fee-for-service-like model, funding for dialysis treatment was argued to favor delivery of in-center dialysis and discouraged home hemodialysis, by making in-center dialysis more profitable and restricting funding flows for reimbursement of home therapies by withholding payment for 90 days. Under the new model, home dialysis payment was set equal to in-center treatment and reimbursement set for immediately upon home therapy administration.[29] Seeing as peritoneal dialysis is approximately $20,000 per year cheaper than in-center hemodialysis, peritoneal dialysis becomes more profitable. According to Manns and Nesrallah 2014, "a reversal was seen in the downward trend in peritoneal dialysis use before implementation of this funding bundle in 2011. Between 2011 and 2013, there was a 15% increase in the number of patients on home dialysis among US dialysis providers, suggesting a strong link between profitability and modality distribution."[30]

According to Chambers 2013, CMS' consultations with stakeholders throughout the structuring of this new bundle model was considered "instrumental" to its successful enactment.[31]

> "The financial incentives created by CMS have probably been the stimulus for growth in home dialysis in general and in PD in particular."
>
> *- "The Possible Impact of the US Prospective Payment System ("Bundle") on the growth of peritoneal dialysis" (2013)*

[25] Golper, TA, Guest S, Glickman JD, Turk J, Pulliam JP, "Home Dialysis in the New USA Bundled Payment Plan: Implications and Impact."(2011) 31(1): 12.
[26] Chambers, James, Weiner DE, Bliss SK, Neumann PJ, "What can we learn from the U.S. expanded end-stage renal disease bundle?" (2013), 110(2-3): 166.
[27] Chambers, James, Weiner DE, Bliss SK, Neumann PJ, "What can we learn from the U.S. expanded end-stage renal disease bundle?" (2013), 110(2-3): 164.
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[30] Manns, Braden, Nesrallah, Gihad, "Do socieoeconomic factors affect dialysis modality selection?" (2014) 9(5): 837-839.
[31] Chambers, James, Weiner DE, Bliss SK, Neumann PJ, "What can we learn from the U.S. expanded end-stage renal disease bundle?" (2013), 110(2-3): 169.

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IHE INSTITUTE OF HEALTH ECONOMICS ALBERTA CANADA

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