CHRONIC KIDNEY DISEASE IN MANITOBA:
CAN WE CHANGE THE FUTURE?

A summary of the report, **Care of Manitobans Living with Chronic Kidney Disease,**
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DECEMBER 2015

Even though you may not know anybody with kidney failure, it affects more people in Manitoba per capita than any other province in Canada. Kidney failure, also known as end stage kidney disease, is the most advanced stage of chronic kidney disease. A kidney transplant or a treatment called dialysis can keep people with kidney failure alive for years. But transplants are not available for everyone, and dialysis comes with major quality-of-life challenges for patients, and a big price tag for the provincial health system. In the rest of Canada, rates of kidney failure have been leveling off, but in Manitoba they continue to grow. How bad will the problem be in 10 years and what can be done to control it? That's what the province's Ministry of Health, Healthy Living and Seniors asked the Manitoba Centre for Health Policy to explore in this study, "Care of Manitobans Living with Chronic Kidney Disease."

What is chronic kidney disease?

With chronic kidney disease, the kidneys gradually lose the ability to do their vital job: cleaning the blood by filtering waste and excess fluid. In the early stages, most people have no symptoms, so their kidneys may become seriously damaged before their diagnosis. An early diagnosis is important to ensure that people get regular monitoring, the right medication and counselling on healthy lifestyles. Although there is no cure for most types of kidney disease, getting the right care can slow down the disease, reduce complications, and help people live longer, better-quality lives.

Kidney disease is usually caused by other chronic conditions, although people can be born with kidney problems or with high risks for developing them. Diabetes and high blood pressure together account for about half of all cases. Older people and people living in poverty, with poor access to healthcare and healthy food, are more likely to develop kidney disease.

More than 1,800 Manitobans are living with kidney failure today. One-third have had a kidney transplant. The other two-thirds are on dialysis, a treatment that patients undergo three to seven times a week, for several hours each time. Patients may receive one of three types of dialysis in Manitoba, shown in Figure 1.

How the study was done

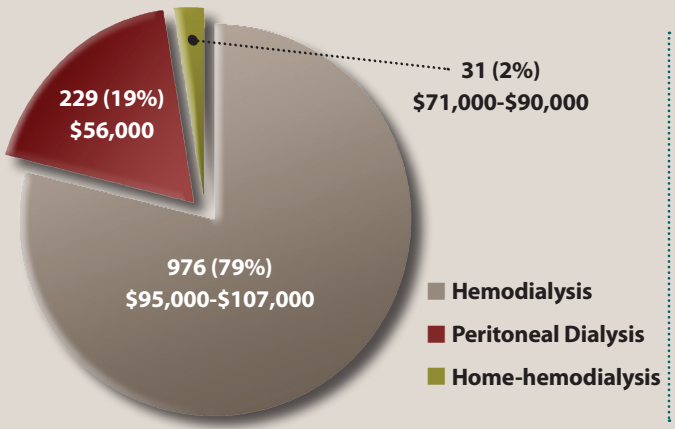
The researchers used de-identified data from the healthcare records of Manitobans with and without chronic kidney disease from 2004 to 2012. De-identified means that identifiers, such as names and addresses, were removed to protect the people's privacy before any data was transferred to the Manitoba Centre for Health Policy. By linking the records of physician visits, hospitalizations, prescriptions, laboratory tests, and treatment for kidney failure, they were able to explore how the need for dialysis and transplants has grown over that period. They also examined how the rates of disease and treatment types differ by geographic region, age group, income, and whether or not people have diabetes. Based on the results of two lab tests recommended for people with chronic kidney disease, the researchers also examined which groups are most at risk of progressing to kidney failure.

Next, the researchers projected these numbers into the future, based on previous patterns, but also accounting for predictable trends like the aging population and increases in diabetes rates. Finally, they tested a series of "what if" scenarios to see what might happen if some of the things that influence kidney disease were changed.

Key findings: huge increase predicted

The study estimates that, by the year 2024, more than 3,000 Manitobans will be getting treatment for kidney failure, either by dialysis or transplant.

FIGURE 1: Number and Percent of Adults on Dialysis (2012) and Annual Cost per Person



- Centre-based hemodialysis is the most common but also the most costly type. Patients must come three times a week to one of 20 treatments centres around the province.
- Peritoneal dialysis is a home-based daily treatment that bypasses the kidneys and uses blood vessels in the patient's abdomen to filter body fluids. Like the other home-based dialysis option, it requires intensive training.
- Home-based hemodialysis uses a small machine that allows patients to do the dialysis process on their own. They need intensive training to do this treatment at home, and not everyone can safely manage it. Although cheaper than centre-based dialysis, so far it has been available for a small but growing number of people.

Annual cost per person based on 2013 data for Canada: Klarenbach SW, Tonelli M, Chui B, Manns BJ. Economic evaluation of dialysis therapies. Nat Rev Nephrol. 2014 Nov;10(11):644-52

FIGURE 2: Observed and Projected Number of Patients with Kidney Failure by Treatment in Manitoba, 2004-2024

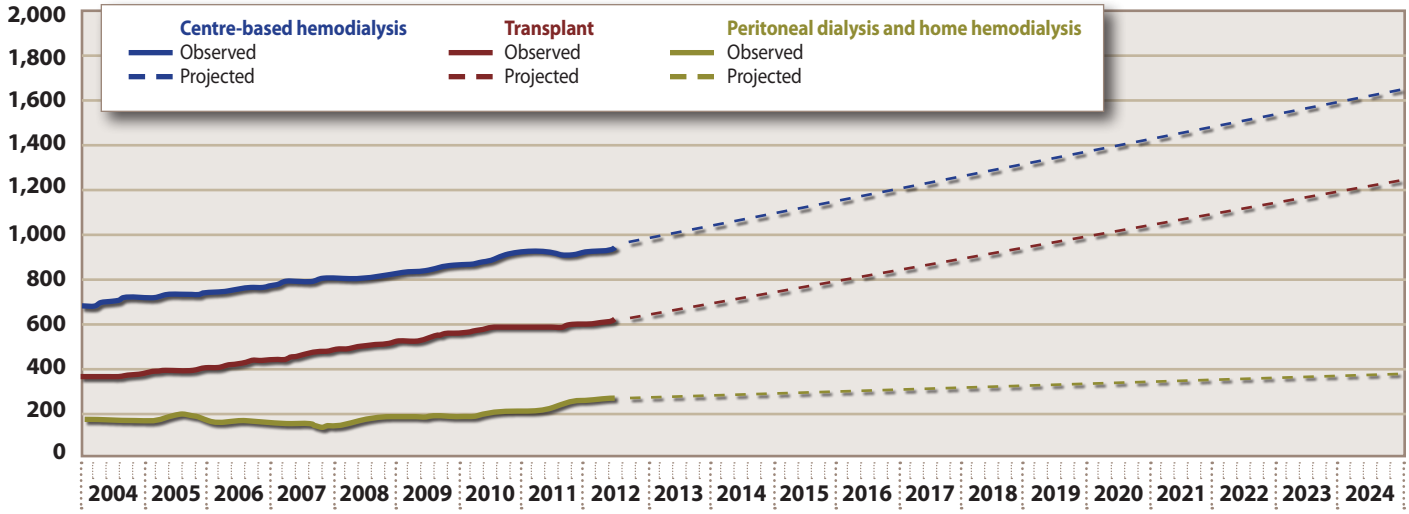


Figure 2 shows how the number of people treated for kidney failure climbed during the years 2004 to 2012 and how the climb is expected to continue over the next decade.

As the graph shows, the biggest increase has been, and will continue to be, in the number of people using centre-based hemodialysis. Meanwhile, the increase in peritoneal dialysis and home-based hemodialysis has been more gradual. Ideally, we would like to see changes in these trends – less centre-based hemodialysis and more peritoneal and home hemodialysis, since the home-based options offer patients a better quality of life and result in lower healthcare costs.

Unless current patterns can be changed, the increasing number of people with kidney failure will hit Manitoba's northern and remote communities especially hard. Rates of the disease are already dramatically higher in those areas – two to three times higher than for the province as a whole. While the reasons for the higher rates are not fully known, this disparity is likely due to the high rates of diabetes and poverty, particularly among First Nations people, and to limited access to health and social services in these communities. By 2024, the gap in rates of kidney failure between regions is projected to widen.

Adults at risk

Today, up to 14% of adults in Manitoba have chronic kidney disease, the highest estimate being nearly 134,000 people, the researchers found. At least one-third are at high risk of progressing to kidney failure. Given what we know about risk factors for chronic kidney disease, it's no surprise that older Manitobans (age 65 and up) and people with lower incomes all have higher rates of the disease.

Adults with chronic kidney disease, particularly those in the advanced stages of the disease, also have remarkably high rates of related health problems, the study found. For example, they are at least five times more likely to have heart disease than adults without chronic kidney disease, nearly 14 times more likely to have had a stroke, more than twice as likely to have a substance abuse problem and five times more likely to have attempted suicide. The use of healthcare services (doctor visits, prescriptions, and hospitalizations) show the same pattern: rates for people with chronic kidney disease are higher than for those without, and rates increase as their disease worsens.

Children at risk

This study is also unique in that it looked at children and teens separately. Only a few countries have reported on the rates and characteristics of children with chronic kidney disease in their populations and no other Canadian data of this kind have ever been published.

More than 8,600 children and teens in Manitoba are living with chronic kidney disease, as of 2012. That's almost 3% of the population age 17 and younger, much lower than the rate for adults but much higher than in other countries where these rates have been reported. And like adults, children in northern and remote communities are about twice as likely to have chronic kidney disease. This is because, also like adults, children in these areas are more likely than other Manitoba children to have diabetes and high blood pressure – some of the key factors that lead to kidney disease.

The research found that about a quarter of Manitoba children and teens with chronic kidney disease are at high risk of progressing to kidney failure, and only a tiny fraction of them have progressed to that last stage. This highlights an important window of opportunity for treatment that can delay progression while the disease is in its early stages. Children who develop kidney disease will live with it a long

TABLE 1: Observed and Projected Number of Patients with Kidney Failure in Manitoba, by "What If" Projection Scenario and Treatment Type, 2012 and 2024

		AVERAGE NUMBER OF PATIENTS			
		Hemodialysis	Peritoneal Dialysis and Home Hemodialysis	Kidney Transplant	Total Number of Kidney Failure Patients
OBSERVED 2012		976	260	597	1,833
PROJECTED 2024		1,653	386	1,038	3,077
"WHAT IF" SCENARIOS 2024	Constant diabetes prevalence	1,445	346	1,014	2,804
	30% of starts are peritoneal dialysis	1,555	481	1,053	3,089
	8% of starts are home hemodialysis	1,587	448	1,045	3,081
	25% increase in kidney transplant rate	1,608	368	1,142	3,118

time and, therefore, their lifetime risk of progressing to kidney failure is significant without such intervention. Also, like adults, they are at high risk for related physical and mental health problems. It is critical to ensure these children get the care they need early and throughout their lives.

What if?

What if we could change some of the factors that affect the number of Manitobans with kidney failure and the type of treatment they use? The study explored four scenarios that experts felt are achievable. Table 1 summarizes the scenarios and results. If we could cap the rise in diabetes in Manitoba (that is if diabetes prevalence stopped going up), that would have the biggest impact on reducing the number of people needing treatment for kidney failure.

Shifting the type of treatment people receive is also an important goal because it would improve the quality of life for people with kidney failure and reduce healthcare costs. The "what if" scenarios showed that if we could increase the use of home-based dialysis options so that 8% of new patients started on home hemodialysis and 30% started on peritoneal dialysis, that would substantially reduce the number of people using centre-based hemodialysis. Increasing kidney transplants by 25% would also result in fewer people needing dialysis.

Improving care for people living with chronic kidney disease

The study points to some ways that care for people living with chronic kidney disease could be improved. One concern is that many people in the earlier stages of the disease are not being diagnosed, particularly people in high-risk groups. Another concern is that many people who have been diagnosed are not being properly monitored. The researchers found that about half of people with kidney disease did not receive the recommended lab tests. This means their doctor did not have the fullest possible information to assess the current status of their disease and provide the most appropriate treatment.

As part of this study, we evaluated a fairly simple tool that could help address these concerns. The tool called the Kidney Failure Risk Equation, calculates a patient's risk of progressing to kidney failure, using four easy-to-obtain measures: age, sex and two lab tests that together evaluate kidney health. This equation proved to do a better job than current methods and could be used to alert family doctors as to which of their patients with chronic kidney disease are at highest risk. This would help ensure that specialist services are used more effectively and may also help more patients who need dialysis to start with one of the home-based options.

A comprehensive public health strategy

This study confirms the number of Manitobans needing treatment for kidney failure will rise dramatically over the next decade unless steps are taken to slow the increase. The report recommends the best way to take action is through a comprehensive public health strategy. The strategy would tackle the bundle of interrelated health issues – diabetes and high blood pressure – that create the conditions for kidney disease to take hold. The strategy also needs to address social factors, such as poverty and lack of access to healthy food, that contribute to these health problems.

The Manitoba Centre for Health Policy at the University of Manitoba's College of Medicine, Faculty of Health Sciences, conducts population-based research on health services, populations and public health and the social determinants of health.

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