

## **Appendix Methods. More sensitivity analyses**

We performed a number of further sensitivity analyses:

- 1) We added a second comparator - adding two new stage 3b-4 CKD clinics. This second clinic was determined in a previous study (12) to be optimally located in Vermilion, Alberta. We also considered three independent alternative sites for the new clinic: Vermilion, Endiang and St. Lina. Again, from a previous study (12), we selected these to be most optimal after Grand Prairie.
- 2) We considered a scenario where we did not reallocate any staffing costs for patients in whom care was shifted from a previous to the new clinic; we assigned all staffing costs as new costs. Since some of the patients served by the new clinic had already been seen by a nephrologist, we also considered the scenario where benefit was attributed only to new patients.
- 3) We doubled and halved the number of patients expected to use the new clinic.
- 4) We explored the effects of using the remote category's comorbidity profile in place of the profile generated using the overall AKDN cohort (10). We substituted the means from the remote distance category (>120 min) for the means using all distance categories for the values of the covariates in the adjusted estimates of effectiveness and costs. Percentage Aboriginal, DM cause of renal disease, heart failure, and COPD were increased in the remote profile and mean age, median eGFR, percent females, subsidy, dementia were decreased in the remote profile.
- 5) One-way sensitivity analyses were performed on all cost and effectiveness parameters using the lower and upper 95% confidence limits where available, or halving and

doubling the estimate where confidence limits were not available. For the stage 3b-4 CKD states, we changed all four estimates to be their respective upper or lower values.

### **Appendix Results. More sensitivity analyses**

- 1) Alternative locations as well as adding a second clinic had similar ICURs (range \$4877-5192/QALY; Appendix Table 3).
- 2) If all expenditures due to staffing the new clinic were considered new costs (meaning that no staff were reallocated), then the ICUR increased to \$6624/QALY (Appendix Table 4). If all benefit was attributed only to new patients then the ICUR increased to \$7942/QALY.
- 3) When we doubled or halved the number of patients attending the proposed clinic, the ICURs remained comparable (\$5854/QALY and \$4477/QALY, respectively).
- 4) When we used the comorbidity profile from the remote category rather than the overall profile for Alberta stage 3b-4 CKD patients, the ICUR decreased minimally (\$3626/QALY vs \$4774/QALY).
- 5) If the start-up and ongoing costs of the proposed clinic were doubled in one-way sensitivity analyses, then the ICURs would not exceed \$7,000/QALY. Under no plausible scenarios were the ICURs cost-saving (Appendix Tables 5 and 6).

**Appendix Table 1. Comparator items: Resource and costs with alternative locations**

Item	Unit valuation,* \$	Quantity				
		Grand Prairie	Grand Prairie and Vermillion	Vermillion	Endiang	St. Lina
<b>Patient counts</b>						
Patients in a ≤120 min service region		876	1557	681	353	517
Patients expected to access service		321	556	304	268	278
Number of new patients		137	226	119	83	92
<b>Start-up clinic</b>						
Examination table	2200	1	2	1	1	1
Thermometer	750	1	2	1	1	1
Glucometer	1500	1	2	1	1	1
Blood pressure cuff	250	1	2	1	1	1
Scale	500	1	2	1	1	1
AED	2500	1	2	1	1	1
Small fridge	200	1	2	1	1	1
Computer	1500	4	8	4	4	4
Office desk	600	2	4	2	2	2
Chair	500	4	8	4	4	4
Phone handset	172	4	8	4	4	4
Reception desk	1500	1	2	1	1	1
Filing cabinet	1500	2	4	2	2	2
Printer	181	1	2	1	1	1
Fax	250	1	2	1	1	1
Garbage can	8.45	4	8	4	4	4
Recycling bin	7.99	4	8	4	4	4
Total, \$		22,719	45,439	22,719	22,719	22,719
Total per patient, <sup>y</sup> \$		70.78	81.72	74.73	84.77	81.72
<b>Ongoing 6-month clinic care</b>						

1200 ft <sup>2</sup> space rental	1300/mo	0.5	1	0.5	0.5	0.5
Cleaning service	845/mo	0.5	1	0.5	0.5	0.5
Phone service	65/mo	4	8	4	4	4
Internet service	60/mo	1	1	1	1	1
Wage plus benefits: added staffing:†						
Administrative assistant	51,900/y	0.3 FTE	0.5	0.3	0.3	0.3
Nurse	85,912/y	0.3	0.5	0.3	0.3	0.3
Dietician	97,349/y	0.1	0.15	0.1	0.1	0.1
Social worker	91,352/y	0.1	0.15	0.1	0.1	0.1
Non-resident nephrologist:						
Air travel trips	463/trip	6 trips	6 trips	0 trips	0 trips	0 trips
Ground travel trips	230/trip	0 trips	6 trips	6 trips	6 trips	6 trips
Hotel	150/d	24 d	48 d	24 d	24 d	24 d
Food	50/d	30 d	60 d	30 d	30 d	30 d
Small medical and office Supplies	1000/6mo	1	1.5	1	1	1
Total, \$		49,850	86,894	49,152	49,152	49,152
Total per patient, \$		155.30	156.85	162.22	183.40	177.44
Including physician claims and medications <sup>€</sup>						
Total, \$		121,324	215,495	121,545	118,218	119,593
Total per patient, \$		377.96	387.58	399.82	441.11	430.19

\*valuation and numbers of resources were estimated by experts.

†this would be staffing hours added for the new patients. Note, physician claim costs are included in Table 3.

‡calculated by dividing the total by the number of patients expected to access service.

€estimated using models adjusting for distance categories; see Table 2.

AED automated external defibrillator

**Appendix Table 2. Distribution of patients with alternative locations**

Model input	6-month estimate and 95% CI				Reference
	≤30 min	30.1-60 min	60.1-120 min	>120 min	
Distribution of patients (across distance categories) with current care <sup>‡</sup>	0	0	0	1	Ayyalasomayajula 2011(8)
Distribution of patients with Grand Prairie clinic	0.403	0.115	0.482	0	Ayyalasomayajula 2011
Distribution of patients with Grand Prairie and Vermilion clinics	0.321	0.301	0.378	0	Ayyalasomayajula 2011
Distribution of patients with Vermilion clinic	0.216	0.539	0.245	0	Ayyalasomayajula 2011
Distribution of patients with Endiang clinic	0	0.326	0.674	0	Ayyalasomayajula 2011
Distribution of patients with St. Lina clinic	0.039	0.435	0.526	0	Ayyalasomayajula 2011

<sup>‡</sup>Distribution (or proportions) of patients across distance categories for current care are based on patients expected to access the service. Patients expected to access the service were calculated from those who be switched from the >120 min distance category to a category within 120 min multiplied by the expected nephrology referral.

**Appendix Table 3. Results: Alternative locations**

<b>Analysis</b>	<b>Comparator</b>	<b>Cost, \$</b>	<b>Cost Δ, \$</b>	<b>Utility</b>	<b>Utility Δ</b>	<b>ICUR, \$/QALY</b>
Primary	Reference case	29525.25	-	8.995	-	-
	Adding one clinic: Grand Prairie	33328.51	3803.26	9.792	0.797	4774.01
Adding a second clinic	Adding a second clinic: Vermilion	33541.84	4016.59	9.818	0.823	4880.43
Alternative sites	Adding one clinic: Vermilion	33410.94	3885.70	9.792	0.797	4877.49
	Adding one clinic: Endiang	33661.19	4135.95	9.792	0.797	5191.61
	Adding one clinic: St. Lina	33590.55	4065.30	9.792	0.797	5102.93

†75.2% of the costs were due to physician claims, 13.1% due to anti-hypertensive medications (specifically ACEi and ARB), 11.7% due to lipid-lowering medications (statins, fibrates, nicotinic acid derivatives, bile acid sequestrants, ezetimibe, probucol)

ICUR incremental cost-utility ratio, QALY quality-adjusted life year, CL confidence limit

**Appendix Table 4. Results: Scenario sensitivity analyses**

Analysis	Comparator/ change	Total cost, \$	Incremental cost, \$	Total QALYs	Incremental QALYs	ICUR, \$/QALY
Primary	Reference case	29525.25	-	8.995	-	-
	Adding one clinic: Grand Prairie	33328.51	3803.26	9.792	0.797	4774.01
No staffing cost reallocation (all new staffing costs)	Ongoing costs: 285.25	34802.32	5277.08	9.792	0.797	6624.00
Nephrology referral	Doubled: 642	34189.28	4664.03	9.792	0.797	5854.48
	Halved: 160	33092.27	3567.02	9.792	0.797	4477.47
Benefit only to new patients	New patients: 135	35853.62	6327.38	9.792	0.797	7942.38
Startup clinic costs	Doubled: 141.56	33399.29	3874.04	9.792	0.797	4862.86
	Halved: 35.39	33293.12	3767.87	9.792	0.797	4729.59
Ongoing clinic costs	Doubled: 310.60	35089.83	5564.58	9.792	0.797	6984.89
	Halved: 77.65	32447.85	2922.61	9.792	0.797	3668.57
Comorbidity profile: Remote category	Revised reference case	33221.75	-	8.662	-	-
	Adding one clinic	36102.50	2880.75	9.456	0.795	3625.53



**Appendix Table 5. Results: “One-way” sensitivity analyses – Stage 3-4 CKD health states**

<b>Analysis</b>	<b>Comparator</b>	<b>Cost, \$</b>	<b>Cost Δ, \$</b>	<b>Utility</b>	<b>Utility Δ</b>	<b>ICUR, \$/QALY</b>
Primary	Reference case	29525.25	-	8.995	-	-
	Adding one clinic: Grand Prairie	33328.51	3803.26	9.792	0.797	4774.01
Transition probability to dialysis care	Revised reference case	30399.58	-	8.979	-	-
	Upper 95% CLs	34334.93	3935.36	9.769	0.790	4979.63
	Revised reference case	29086.34	-	9.004	-	-
	Lower 95% CLs	32639.93	3553.59	9.808	0.804	4419.80
Transition probability to mortality	Revised reference case	28545.19	-	8.692	-	-
	Upper 95% CLs	32467.39	3922.20	9.533	0.841	4664.33
	Revised reference case	30220.31	-	9.210	-	-
	Lower 95% CLs	34189.08	3968.78	10.051	0.841	4720.61
Probability of hospitalization	Revised reference case	30431.42	-	8.995	-	-
	Upper 95% CLs	34023.61	3592.19	9.792	0.797	4509.09
	Revised reference case	28701.45	-	8.995	-	-
	Lower 95% CLs	32663.22	3961.77	9.792	0.797	4972.98
Life-years	Revised reference case	29525.25	-	5.235 life-years	-	-
	Adding one clinic	33328.51	3803.26	5.701 life-years	0.466	8161.69/ life-year
Utility score	Revised reference case	29525.25	-	9.308	-	-
	Upper 95% CLs	33328.51	3803.26	10.132	0.824	4615.56
	Revised reference case	29525.25	-	8.578	-	-
	Lower 95% CLs	33328.51	3803.26	9.338	0.760	5003.03

Analysis	Comparator	Cost, \$	Cost Δ, \$	Utility	Utility Δ	ICUR, \$/QALY
Physician claim and medication cost†	Revised reference case	29677.41	-	8.995	-	-
	Upper 95% CLs	33459.92	3782.51	9.792	0.797	4747.96
	Revised reference case	29379.43	-	8.995	-	-
	Lower 95% CLs	33201.80	3822.37	9.792	0.797	4797.99
Hospitalization cost	Revised reference case	31292.86	-	8.995	-	-
	Upper 95% CLs	34669.92	3377.06	9.792	0.797	4239.02
	Revised reference case	27753.45	-	8.995	-	-
	Lower 95% CLs	31986.72	4233.28	9.792	0.797	5313.78

†75.2% of the costs were due to physician claims, 13.1% due to anti-hypertensive medications (specifically ACEi and ARB), 11.7% due to lipid-lowering medications (statins, fibrates, nicotinic acid derivatives, bile acid sequestrants, ezetimibe, probucol)

ICUR incremental cost-utility ratio, QALY quality-adjusted life year, CL confidence limit

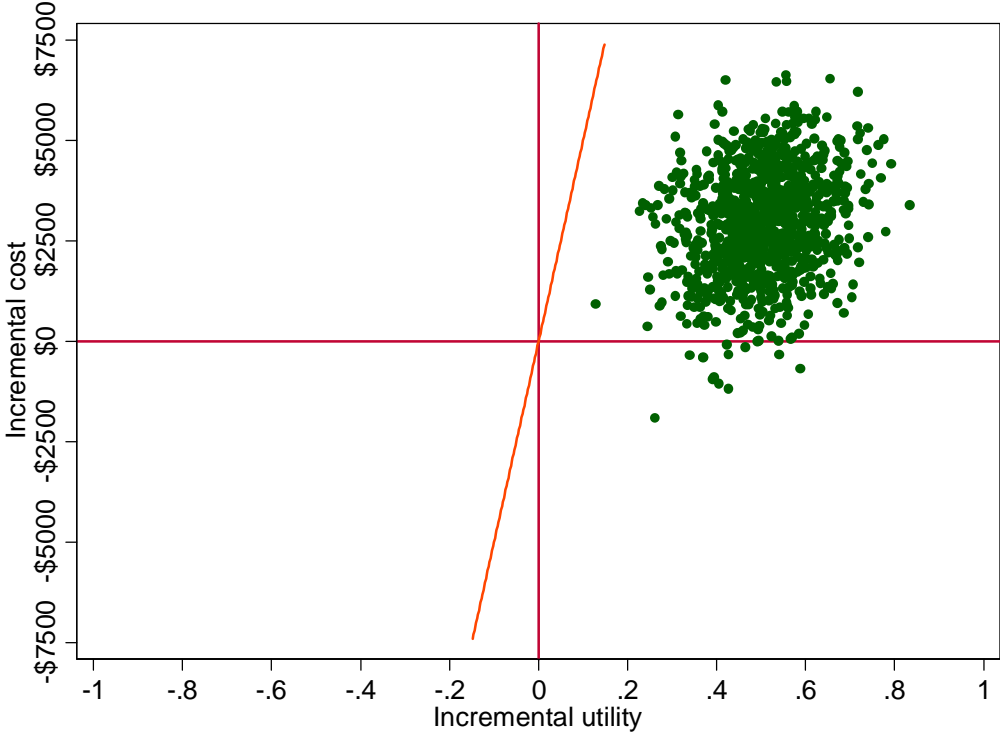
**Appendix Table 6. Results: One-way sensitivity analyses – Other health states**

Analysis	Comparator	Cost, \$	Cost Δ, \$	Utility	Utility Δ	ICUR, \$/QALY
Transition probability to transplantation care from dialysis	Revised reference case	29452.09	-	8.997	-	-
	Doubled: 0.024	33220.50	3768.41	9.794	0.798	4725.21
	Revised reference case	29564.15	-	8.994	-	-
	Halved: 0.006	33385.92	3821.77	9.790	0.796	4799.97
Transition probability to mortality from dialysis	Revised reference case	29469.72	-	8.994	-	-
	Upper 95% CLs: 0.105	33245.20	3775.48	9.791	0.796	4741.58
	Revised reference case	29584.89	-	8.996	-	-
	Lower 95% CLs: 0.095	33418.02	3833.13	9.793	0.797	4808.85
Transition probability to mortality from transplantation	Revised reference case	29527.35	-	8.994	-	-
	Doubled: 0.048	33324.57	3802.00	9.791	0.796	4774.94
	Revised reference case	29527.35	-	8.996	-	-
	Halved: 0.012	33331.60	3804.25	9.793	0.797	4773.05
Transition probability to dialysis care (graft failure)	Revised reference case	29538.97	-	8.995	-	-
	Upper 95% CLs: 0.05	33348.65	3809.68	9.791	0.796	4783.06
	Revised reference case	29513.13	-	8.996	-	-
	Lower 95% CLs: 0.0001	33310.75	3797.62	9.792	0.797	4766.06
Utility score for dialysis	Revised reference case	29525.25	-	8.997	-	-
	Upper 95% CLs: 0.652	33328.51	3803.26	9.794	0.797	4769.28
	Revised reference case	29525.25	-	8.994	-	-

Analysis	Comparator	Cost, \$	Cost Δ, \$	Utility	Utility Δ	ICUR, \$/QALY
	Lower 95% CLs: 0.566	33328.51	3803.26	9.789	0.796	4778.75
Utility score for transplantation	Revised reference case	29525.25	-	8.996	-	-
	Ceilinged: 0.99	33328.51	3803.26	9.793	0.797	4771.12
	Revised reference case	29525.25	-	8.994	-	-
	Halved: 0.37	33328.51	3803.26	9.790	0.796	4778.30
Cost for dialysis	Revised reference case	29642.30	-	8.995	-	-
	Upper 95% CLs: 49133	33503.34	3861.05	9.792	0.797	4846.55
	Revised reference case	29404.04	-	8.995	-	-
	Lower 95% CLs: 42731	33147.47	3743.43	9.792	0.797	4698.91
Cost for transplantation	Revised reference case	29525.25	-	8.995	-	-
	Upper 95% CLs: \$30963 pretransplant \$30419 during first year \$12498 after first year	33328.51	3803.26	9.792	0.797	4774.01
	Revised reference case	29525.25	-	8.995	-	-
	Lower 95% CLs: \$23953 pretransplant \$25146 during first year \$10336 after first year	33328.51	3803.26	9.792	0.797	4774.01

ICUR incremental cost-utility ratio, QALY quality-adjusted life year, CL confidence limit

**Appendix Figure. Probability sensitivity analysis: One added clinic vs none**



**Willingness-to-pay was set equal to \$50,000.**