

Supplemental Material Table of Contents

Supplemental Table 1: Checklist of items from the REporting of studies Conducted using Observational Routinely-collected health Data (RECORD) guidelines for observational studies

Supplemental Table 2: Data sources and codes used to define study criteria, exposures, outcomes, and covariates

Supplemental Table 3: Characteristics of patients before propensity score matching

Supplemental Table 4: Association of time to first disease-specific hospitalization for an ambulatory care sensitive condition with primary care physician continuity in 6391 propensity-matched patients

Supplemental Table 5: Association of all-cause mortality and all-cause hospitalizations with any primary care physician visit in the 90-days after dialysis initiation (main cohort, patients excluded if <3 visits in 2 years prior to dialysis initiation) in propensity-matched patients (n=4305 per group)

Supplemental Table 6: Association of all-cause mortality and all-cause hospitalizations with any primary care physician visit in the 90-days after dialysis initiation (patients included if <3 visits in 2 years prior to dialysis initiation) in propensity-matched patients (n=4701 per group)

Supplemental Table 7: Association of all-cause mortality and all-cause hospitalizations with primary care physician continuity (UPC ascertained in the year before and after dialysis initiation, with outcome ascertainment starting 1 year after dialysis initiation) in propensity-matched patients (n=6183 per group)

Supplemental Figure 1: Forest plot for mortality and hospitalizations stratified by dialysis modality. Home hemodialysis is not shown due to small numbers. Error bars indicate 95% confidence intervals.

Supplemental Table 1: Checklist of items from the REporting of studies Conducted using Observational Routinely-collected health Data (RECORD) guidelines for observational studies

Please refer to the additional supplemental PDF for the completed RECORD checklist.

Supplemental Table 2: Data sources and codes used to define study criteria, exposures, outcomes, and covariates

Study Concept	Data Source/Code Type
<i>Inclusion criteria</i>	
Incident dialysis	Canadian Organ Replacement Register (CORR)
First dialysis session	Ontario Health Insurance Plan (OHIP) Fee code: G082, G083, G085, G090- G096, G294, G295, G323, G325, G326, G330, G331, G333, G860-G866, H540, H740, R849 CCP: 5195, 6698 CCI: 1PZ21
<i>Exclusion criteria</i>	
Residence in a long-term care facility	Ontario Drug Benefit Claims
Kidney transplant in five years prior to index date	CORR
<3 primary care visits in two years prior to dialysis initiation	ICES Physician Database (IPDB)
Total number of hospital days ≥ 30 in the first 90 days after dialysis initiation	Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)
<i>Exposure</i>	
Primary care physician	IPDB
<i>Outcomes</i>	
Death	Registered Persons Database (RPDB)
Hospitalization	CIHI-DAD
Hospitalization for:	Most responsible diagnosis in CIHI-DAD with ICD-10 code:
Diabetes	E10, E11, E13, E14
Heart failure	I50
Myocardial infarction	I21, I22
Stroke/transient ischemic attack	G450-G453, G458, G459, H340, H341, I600-I607, I609, I61, I62, I630-I635, I638, I639, I64
Sepsis	A021, A392, A393, A394, A400-A402, A403, A408, A409, A410-A414, A4150, A4151, A4152, A4158, A4159, A4180, A4188, A419, A427
Chronic obstructive pulmonary disease	J41, J43, J44

Study Concept	Data Source/Code Type
Depression	F204, F313-F315, F32, F33, F341, F412, F432
Chronic pain (requires two hospitalizations in ≤ 30 days)	F454, M081, M2550, M2551, M2555, M2556, M2557, M432-M436, M45, M461, M463, M464, M469, M47, M480, M481, M488, M489, M508, M509, M51, M531, M532, M533, M538, M539, M54, M608, M609, M633, M790, M791, M792, M796, M797, M961
Delirium	293
Fracture	S220-S224, S320-S329, S420-S423, S52, S720-S723, S82
Ambulatory care sensitive conditions:	
Heart failure	I09.9, I11.0, I13.0, I13.2, I25.5, I42.0, I42.5-I42.9, I43, I50
Volume overload	E87.7
Malignant hypertension	I10.1
Hyperkalemia	E87.5
<i>Covariates—Demographics</i>	
Age	RPDB
Sex	RPDB
Ethnicity	CORR
Income quintile	RPDB
Rural residence	RPDB
Rostered to a primary care physician	Client Agency Program Enrolment database
Primary cause of end-stage kidney disease	CORR
Dialysis modality	CORR
<i>Covariates—Healthcare utilization</i>	
Physician visits	IPDB
Number of hospital days	CIHI-DAD
Home care	Home Care Database
<i>Covariates—Comorbidities</i>	
Diabetes (requires one inpatient or two outpatient claims)	CIHI-DAD ICD-9: 250 ICD-10: E10, E11, E13, E14 OHIP Diagnosis code: 250

Study Concept	Data Source/Code Type
	Fee code: K029, K030, K045, K046, Q040
Heart failure (requires one inpatient or two outpatient claims)	CIHI-DAD ICD-9: 425, 428, 514, 5184 ICD-10: I099, I255, I420, I425-I429, I43, I50, J81 CCP: 4961-4964 CCI: IHP53, IHP55, IHZ53GRFR, IHZ53LAFR, IHZ53SYFR OHIP Diagnosis code: 428 Fee code: R701, R702, Z429
Myocardial infarction	CIHI-DAD ICD-9: 410 ICD-10: I21, I22
Stroke/transient ischemic attack	CIHI-DAD ICD-9: 3623, 430, 431, 432, 434, 435, 436 ICD-10: G450-G453, G458, G459, H340, H341, I600-I607, I609, I61, I62, I630-I635, I638, I639, I64
Chronic obstructive pulmonary disease	CIHI-DAD ICD-9: 491, 492, 496 ICD-10: J41, J43, J44
Hypertension	Ontario Hypertension database
Cancer	CIHI-DAD ICD-9: V10, 140-149, 150-159, 160-165, 170-176, 179, 180-189, 190-194, 1950-1955, 1958, 196-198, 1990, 1991, 2000, 2001, 2002, 2008, 2010, 2011, 2012, 2014, 2015, 2016, 2017, 2019, 2020, 2026, 2028, 2029, 203-208, 230-234 ICD-10: C00-C09, C10-C19, C20-C26, C30-C34, C37-C39, C40-C41, C43-C49, C50-C58, C60-C69, C70-C79, C80-86, C8800, C8808, C90-C97, D00-D07, D09, Z85 80003, 80006, 80013, 80023, 80033, 80043, 80102, 80103, 80106, 80113, 80123, 802, 803, 80413, 80423, 80433, 80453, 80502, 80503, 80513, 80523, 807, 808, 80903, 80913, 80923, 80933, 80943, 80953, 81103, 81202, 81203, 81213, 81223, 81233, 81243, 81303, 81402, 81403, 81406, 81413, 81423, 81433, 81443, 81453, 81473, 81503, 81513, 81523, 81533, 81543, 81553, 81603, 81613, 81623, 81703, 81713, 81803, 81903, 82003, 82013, 82102,

Study Concept	Data Source/Code Type
	<p>82103, 82113, 82203, 82213, 823, 82403, 82413, 82433, 82443, 82453, 82463, 82473, 82503, 82513, 82603, 82612, 82613, 82623, 82632, 82633, 82703, 82803, 82813, 82903, 83003, 83103, 83123, 83143, 83153, 83203, 83223, 83233, 83303, 83313, 83323, 83303, 83313, 83323, 83403, 83503, 83703, 83803, 83813, 83903, 84003, 84013, 84103, 84203, 84303, 84403, 84413, 84423, 84503, 84513, 84603, 84613, 84623, 84703, 84713, 84723, 84733, 84803, 84806, 84813, 849, 85002, 85003, 85012, 85013, 85023, 85032, 85033, 85042, 85043, 851, 852, 85303, 854, 85503, 85603, 85623, 857, 85803, 86003, 86203, 86303, 86403, 86503, 86803, 86903, 86933, 87003, 87103, 87202, 87203, 87213, 87223, 87233, 87303, 87403, 87412, 87413, 87422, 87423, 87433, 87443, 87453, 87613, 87703, 87713, 87723, 87733, 87743, 87803, 88003, 88006, 88013, 88023, 88033, 88043, 88103, 88113, 88123, 88133, 88143, 88303, 88323, 88333, 88403, 88503, 88513, 88523, 88533, 88543, 88553, 88583, 88903, 88913, 88943, 88953, 88963, 89003, 89013, 89023, 89103, 89203, 89303, 89333, 89403, 89413, 895, 89603, 89633, 89643, 897, 89803, 89813, 89903, 89913, 90003, 90203, 90403, 90413, 90423, 90433, 90443, 90503, 90513, 90523, 90533, 906, 90703, 90713, 90723, 90803, 90813, 90823, 90833, 90843, 90853, 90903, 91003, 91013, 91023, 91103, 91203, 91243, 91303, 91333, 91403, 91503, 91703, 91803, 91813, 91823, 91833, 91843, 91853, 91903, 92203, 92213, 92303, 92313, 92403, 92503, 92513, 92603, 92613, 92703, 92903, 93103, 93303, 93623, 93643, 93703, 93803, 93813, 93823, 93903, 93913, 93923, 940, 941, 942, 94303, 944, 945, 94603, 947, 948, 94903, 95003, 95013, 95023, 95033, 95043, 951, 952, 95303, 95393, 95403, 95603, 95613, 95803, 95813, 959 965, 966, 967, 968, 969, 970-973, 97403, 97413, 97603, 97613, 97623, 97633, 97643, 980, 982, 98303, 984, 98503, 986, 98703, 98803, 989, 99003, 99103, 993, 994,</p> <p>OHIP Diagnosis code: 140-149, 150-159, 160-165, 170-175, 179, 180-189, 190-199, 200-208, 230-234</p>
Chronic liver disease	<p>CIHI-DAD ICD-9: 070, 2750, 2751, 4561, 4562, 571, 5722, 5723, 5724, 5728, 573, 7824, 7891, 7895, V026 ICD-10: B16-19, B942, E831, E830, I85, K70, K713, K714, K715, K717, K721, K729, K73, K74, K753, K754, K758, K759, K76, K77, R160, R162, R17, R18, Z225</p>

Study Concept	Data Source/Code Type
	<p>OHIP Diagnosis code: 070, 571, 573 Fee code: Z551, Z554</p>
Peripheral vascular disease	<p>CIHI-DAD ICD-9: 4439, 4402, 4408, 4409, 444, 5571 ICD-10: I700, I702, I708, I709, I731, I738, I739, K551 CCP: 5014, 5016, 5018, 5028, 5038, 5125, 5126, 5129, 5159 CCI: 1KA50, 1KA76, 1KE76, 1KG50, 1KG57, 1KG76MI, 1KG87, 1IA87LA, 1IB87LA, IC87LA, IID87LA, 1KA87LA, 1KE57</p> <p>OHIP Fee code: E626, E649, E672, R780, R783-R787, R791, R794, R797, R804, R809, R813-R815, R855, R856, R860, R861, R867, R875, R933, R934, R936, R937</p>
Depression	<p>CIHI-DAD/National Ambulatory Care Reporting System (NACRS) ICD-9: 2962, 2963, 2965, 3004, 309, 311 ICD-10: F204, F313-F315, F32, F33, F341, F412, F432</p>
Chronic pain (requires two claims in ≤30 days)	<p>CIHI-DAD/NACRS ICD-9: 7200, 7202, 7209, 7210-7214, 7216, 7218, 7219, 722, 7230, 7231, 7233-7239, 7240-7246, 7248, 7249, 7290, 7291, 7292, 7294, 7295 ICD-10: F454, M081, M2550, M2551, M2555, M2556, M2557, M432-M436, M45, M461, M463, M464, M469, M47, M480, M481, M488, M489, M508, M509, M51, M531, M532, M533, M538, M539, M54, M608, M609, M633, M790, M791, M792, M796, M797, M961</p>
Dementia (requires one inpatient or two outpatient claims)	<p>CIHI-DAD ICD-9: 2900-2904, 2908, 2909, 2941, 2948, 2949, 3310, 3311, 3312, 797 ICD-10: F00-F03, F051, F065, F066, F068, F069, F09, G30, G31, R54</p> <p>OHIP Diagnosis code: 290, 331, 797</p>

Supplemental Table 3: Characteristics of patients before propensity score matching

Baseline Characteristics	Low Continuity (n=12,487)	High Continuity (n=6612)	Standardized Difference
<i>Demographics</i>			
Age (years), mean (SD)	64 (15)	68 (13)	0.27
Female, %	40	38	0.05
Ethnicity, %			
Caucasian	69	73	0.08
Black	6	4	0.09
Asian	6	7	0.08
Indian	6	6	0.03
Other/Unknown	13	10	0.09
Income quintile, %			
1 (lowest income)	26	23	0.05
2	22	23	0.02
3	19	20	0.01
4	18	18	0.00
5 (highest income)	15	16	0.03
Rural residence, %	13	12	0.03
Rostered to a primary care physician, %	79	85	0.17
Primary cause of end-stage kidney disease, %			
Glomerulonephritis	13	12	0.04
Cystic kidney disease	4	4	0.02
Diabetes	38	39	0.01
Vascular disease	17	20	0.09
Other	14	12	0.04
Unknown	14	13	0.02
Dialysis modality, %			
In-centre hemodialysis	78.9	75.6	0.08
Home hemodialysis	1.1	0.8	0.03
Peritoneal dialysis	20.0	23.6	0.09

Baseline Characteristics	Low Continuity (n=12,487)	High Continuity (n=6612)	Standardized Difference
Year of cohort entry, %			
2005	6	8	0.05
2006	9	9	0.01
2007	9	9	0.01
2008	9	9	0.00
2009	9	9	0.01
2010	10	11	0.03
2011	9	10	0.01
2012	11	10	0.01
2013	12	11	0.01
2014	13	11	0.05
2015	3	3	0.04
<i>Comorbidities, %</i>			
Diabetes	60	61	0.03
Heart failure	41	40	0.02
Myocardial infarction	14	13	0.01
Stroke/transient ischemic attack	6	4	0.05
Chronic obstructive pulmonary disease	10	9	0.02
Hypertension	91	94	0.12
Cancer	37	39	0.05
Chronic liver disease	11	10	0.05
Peripheral vascular disease	9	8	0.02
Depression	5	3	0.09
Chronic pain	10	7	0.12
Dementia	6	5	0.07
Charlson comorbidity index, mean (SD)	3.8 (1.9)	3.6 (1.8)	0.11
<i>Healthcare utilization in previous year, mean (SD)</i>			
No. of visits to all primary care physicians	14.4 (16.7)	15.6 (12.9)	0.08
No. of visits to most frequent primary care physician	6.5 (8.2)	13.0 (10.7)	0.68
No. of internal medicine visits	6.7 (11.0)	5.1 (7.7)	0.17

Baseline Characteristics	Low Continuity (n=12,487)	High Continuity (n=6612)	Standardized Difference
No. of nephrology visits	26.2 (15.2)	23.3 (10.8)	0.23
No. of endocrinology visits	1.2 (3.8)	0.9 (2.6)	0.10
No. of cardiology visits	5.6 (9.3)	5.1 (8.3)	0.05
No. of geriatric medicine visits	0.5 (3.0)	0.3 (1.9)	0.08
No. of psychiatry visits	0.5 (3.7)	0.3 (2.2)	0.08
No. of hospitalization days over prior year	19.0 (26.0)	12.9 (18.3)	0.27
No. of hospitalization days between first dialysis session and index date	15.1 (28.9)	9.7 (16.7)	0.23
Home care, %	45	42	0.06
<i>Physician characteristics</i>			
Age (years), mean (SD)	53 (11)	55 (10)	0.21
Female, %	26	19	0.17
Number of years since graduation, mean (SD)	27 (12)	29 (10)	0.21
International medical graduate, %	22	19	0.08
Hospital affiliation, %	38	33	0.11
Rural practice, %	10	10	0.00
Dialysis patient volume in previous year			
0	19	18	0.03
1	22	22	0.00
2	18	19	0.04
3	13	14	0.03
4	8	9	0.03
≥5	20	18	0.05

Supplemental Table 4: Association of time to first disease-specific hospitalization for an ambulatory care sensitive condition with primary care physician continuity in 6391 propensity-matched patients*

Outcome and Exposure	No. (%) of Events	Event Rate (per 100 person-years)	Hazard Ratio (95% CI)
Heart failure			
High continuity	942 (15)	9.25	0.94 (0.86-1.03)
Low continuity	994 (16)	9.86	
Volume overload			
High continuity	267 (4)	2.51	1.00 (0.84-1.18)
Low continuity	265 (4)	2.51	
Malignant hypertension			
High continuity	Small cell	Small cell	1.98 (0.50-7.92)
Low continuity			
Hyperkalemia			
High continuity	344 (5)	3.25	0.86 (0.74-0.99)
Low continuity	398 (6)	3.80	

*Each patient could contribute to multiple disease-specific hospitalizations, as long as it was their first hospitalization for the disease in question

Supplemental Table 5: Association of all-cause mortality and all-cause hospitalizations with any primary care physician visit in the 90-days after dialysis initiation (main cohort, patients excluded if <3 visits in 2 years prior to dialysis initiation) in propensity-matched patients (n=4305 per group)

Outcome and Exposure	No. (%) of Events	Event Rate (per 100 person-years)	Hazard Ratio (95% CI)
All-cause mortality			
Any PCP visit	874 (20)	11.8	1.03 (0.94-1.13)
No PCP visit	851 (20)	11.4	Referent
Rate of hospitalizations			
Any PCP visit	7105	151.2	1.03 (0.97-1.09)
No PCP visit	6928	142.8	Referent

Supplemental Table 6: Association of all-cause mortality and all-cause hospitalizations with any primary care physician visit in the 90-days after dialysis initiation (patients included if <3 visits in 2 years prior to dialysis initiation) in propensity-matched patients (n=4701 per group)

Outcome and Exposure	No. (%) of Events	Event Rate (per 100 person-years)	Hazard Ratio (95% CI)
All-cause mortality			
Any PCP visit	904 (19)	11.2	1.01 (0.92-1.11)
No PCP visit	897 (19)	11.0	Referent
Rate of hospitalizations			
Any PCP visit	7758	151.4	1.05 (0.99-1.10)
No PCP visit	7428	139.4	Referent

Supplemental Table 7: Association of all-cause mortality and all-cause hospitalizations with primary care physician continuity (UPC ascertained in the year before and after dialysis initiation, with outcome ascertainment starting 1 year after dialysis initiation) in propensity-matched patients (n=6183 per group)

Outcome and Exposure	No. (%) of Events	Event Rate (per 100 person-years)	Hazard Ratio (95% CI)
All-cause mortality			
High continuity	1486 (24)	14.3	0.97 (0.91-1.05)
Low continuity	1520 (25)	14.7	Referent
Rate of hospitalizations			
High continuity	9451	137.5	0.89 (0.85-0.93)
Low continuity	10623	161.5	Referent

Supplemental Figure 1: Forest plot for mortality and hospitalizations stratified by dialysis modality. Home hemodialysis is not shown due to small numbers. Error bars indicate 95% confidence intervals.

