

Supplemental Material

Table S1. Prevalence of frailty index components in a cross section of transplant candidates from Halifax, NS

FI variables by domain	Value
Social/cognitive	
Socializes rarely	30/104 (29%)
Emotional problems interfere with activities	14/105 (13%)
Cut down on work because of emotional problems	5/105 (5%)
Feeling Lonely	11/104 (11%)
Abnormal word recall	31/111 (28%)
Impaired clock draw	41/110 (71%)
Functional	
Needs help with:	
Meals	5/104 (5%)
Shopping	7/104 (7%)
Chores	13/104 (13%)
Finances	5/104 (5%)
Impaired in:	
Carrying groceries	30/103 (29%)
Carry ten pounds	8/104 (8%)
Weak grip strength	23/111 (21%)
Cut down work due to physical health	30/105 (29%)
Cut down activity (last month)	12/100 (12%)
Mobility	
Ltd. In bending, kneeling, stooping	24/104 (23%)
Help up/down stairs	4/104 (4%)
Help in/out of chair	2/104 (2%)
Ltd. For one flight of stairs	6/104 (6%)
Limited walking 100m	5/102 (5%)
Requires a cane/walker	10/103 (10%)
Low physical activity	12/111 (11%)
Slow walking speed	7/109 (6%)
Exhaustion: self-report	30/110 (27%)
Infrequent walking	17/103 (17%)
Comorbidity	
CHF	13/111 (12%)
CAD	12/111 (11%)
CVD	8/111 (7%)
CLD	4/111 (4%)
DM	28/111 (25%)
MSKD	26/98 (27%)
Prior malignancy	13/111 (12%)
Polypharmacy*	35/111 (32%)
Weight loss	18/111 (16%)
Low albumin**	10/111 (9%)
Self-rated low health	4/104 (4%)
Self-rated worsening of health (last year)	27/101 (27%)

CHF: congestive heart failure, CAD: coronary artery disease, CVD: cerebrovascular disease,
CLD: chronic lung disease, DM: diabetes, MSK: musculoskeletal disease. *>10 meds/day,
**<30 g/L

Table S2. Baseline characteristics

Variable	Value
Demographics N (%) unless specified	
Age (yr), mean±SD	54±14
Age >65 yr	132 (24)
Male Sex	346 (64)
White race	437 (81)
Site	
Atlantic Canada*	113 (21)
Hamilton	83 (15)
London	317 (59)
Montreal	29 (5)
Cause of ESRD	
DM	152 (28)
Vascular/HTN	37 (7)
GN	141 (26)
Congenital	90 (17)
Structural	39 (7)
Other	83 (15)
Dialysis vintage yr, median and IQR	0.9 (0, 2.0)
Dialysis type	
HD	283 (52)
- Hospital HD	- 134 (25)
- Satellite HD	- 115 (21)
- Home HD	- 34 (6)
PD	110 (20.30)
- CAPD	- 27 (5)
- CCPD	- 83 (15)
Pre-emptive	132 (24)
Unknown	17 (3)
Laboratory investigations	
Albumin	38+/-6
Hemoglobin	109+/-16
Parathyroid hormone	49+/-51
Comorbidities	
DM	209 (39)
CAD	97 (18)
CHF	149 (28)
CVD	40 (7)
PVD	40 (7)
Chronic lung disease	39 (7)
Chronic liver disease	34 (6)
Previous malignancy	61 (11)
Previous Kidney transplant	60 (11)
BMI	
Underweight (<18.5)	19 (4)
Normal (18.5-24.9)	146 (27)
Overweight (25.0-29.9)	167 (31)
Obese 1 (30.0-34.9)	126 (23)
Obese 2 (35.0-39.9)	56 (10)
Obese 3 (>= 40.0)	28 (5)

Karnofsky Performance Scale	
Fully active	294 (54)
Ambulatory, light work	180 (33)
Ambulatory, self-care	30 (6)
Limited self-care, 50% of time in bed	3 (1)
Disabled	2 (0)
Unknown	33 (6)
Activated to waitlist	339 (63)
ESRD: end stage renal disease, DM: diabetes, GN: glomerulonephritis, HD: hemodialysis, PD: peritoneal dialysis, CAPD: continuous ambulatory PD, CCPD: chronic cycling PD, CAD: coronary artery disease, CHF: congestive heart failure, CVD: cerebrovascular disease, PVD: peripheral vascular disease	

Table S3. Differences in demographics among patients by frailty status according to the Frailty Phenotype

Variable	Frail patients (n=88, 16%)	Non-frail patients (n = 454, 84%)	p-value
Demographics			
Age (yr), mean±SD	58±14	54±14	
Age >65 yr N (%)	36 (41)	96 (21)	<0.001
Male Sex N (%)	51 (58)	295 (65)	0.226
White race N (%)	73 (83)	364 (80)	0.659
Site N (%)			0.209
Atlantic Canada*	11 (13)	102 (23)	
Hamilton	14 (16)	69 (15)	
London	60 (68)	257 (57)	
Montreal	3 (3)	26 (6)	
Cause of ESRD N (%)			0.261
DM	35 (40)	117 (26)	
Vascular/HTN	5 (6)	32 (7)	
GN	20 (23)	121 (27)	
Congenital	12 (14)	78 (17)	
Structural	5 (6)	34 (8)	
Other	11 (13)	72 (16)	
Dialysis vintage yr, median (IQR)	1.2 (0.4, 2.2)	0.8 (0, 2.0)	0.034
Dialysis type N (%)			0.060
HD	54 (61)	229 (50)	
PD	20 (23)	90 (20)	
Pre-emptive	13 (15)	119 (26)	
Unknown	1 (1)	16 (4)	
Comorbidities N (%)			
DM	45 (51)	164 (36)	0.012
CAD	25 (28)	72 (16)	0.009
CHF	28 (32)	120 (27)	0.361
CVD	12 (14)	28 (6)	0.023
PVD	9 (10)	31 (7)	0.267
Chronic lung disease	5 (6)	31 (8)	0.657
Chronic liver disease	6 (7)	28 (6)	0.811
Previous malignancy	14 (16)	47 (10)	0.141
Previous Kidney transplant N (%)	6 (7)	54 (12)	0.196
BMI N (%)			0.672
Underweight (<18.5)	2 (2)	17 (4)	
Normal (18.5-24.9)	24 (27)	122 (27)	
Overweight (25.0-29.9)	26 (30)	141 (31)	
Obese 1 (30.0-34.9)	22 (25)	104 (23)	
Obese 2 (35.0-39.9)	12 (14)	44 (10)	
Obese 3 (>= 40.0)	2 (2)	26 (6)	
ESRD: end stage renal disease, DM: diabetes, GN: glomerulonephritis, HD: hemodialysis, PD: peritoneal dialysis, CAPD: continuous ambulatory PD, CCPD: chronic cycling PD, CAD: coronary artery disease, CHF: congestive heart failure, CVD: cerebrovascular disease, PVD: peripheral vascular disease			

Table S4. Frailty index and Clinical frailty scale scores for the overall population and across subgroups

	CFS, median (IQR)	FI, mean±SD
Prevalence of frailty*	15%	34%
Total	3 (2,3)	0.223 ± 0.137, max 0.703
Variable		
Age		
>65 yr	3 (2,3)	0.250 ± 0.148
<65 yr	2 (2,3)	0.213 ± 0.132
Sex		
Male	2 (2,3)	0.220 ± 0.130
Female	3 (2,3)	0.228 ± 0.147
Race		
White	2.5 (2,3)	0.222 ± 0.138
Non-white	3 (2,3)	0.226 ± 0.131
Site		
Atlantic Canada*	3 (2,3)	0.204 ± 0.127
Hamilton	3 (2,4)	0.248 ± 0.138
London	2 (2,3)	0.229 ± 0.140
Montreal	2 (1,4)	0.151 ± 0.107
Cause of ESRD		
DM	3 (2,3)	0.277 ± 0.141
Vascular/HTN	2 (2,3)	0.209 ± 0.109
GN	2 (2,3)	0.200 ± 0.126
Congenital	2 (2,3)	0.187 ± 0.127
Structural	2 (2,3)	0.206 ± 0.115
Other	3 (2,3)	0.213 ± 0.151
Dialysis vintage		
>1 year	3 (2,4)	0.246 ± 0.137
<1 year	2 (2,3)	0.202 ± 0.133
Dialysis type		
HD	3 (2,3)	0.240 ± 0.142
PD	3 (2,3)	0.250 ± 0.125
Pre-emptive	2 (2,3)	0.173 ± 0.120
Comorbidities		
Diabetes	3 (2,3)	0.274 ± 0.137
CAD	3 (2,3)	0.296 ± 0.138
CHF	3 (2,3)	0.283 ± 0.144
CVD	3 (3,4)	0.323 ± 0.153
PVD	3 (2,3)	0.274 ± 0.150
Chronic lung disease	3 (2,4)	0.248 ± 0.112
Chronic liver disease	2 (2,3)	0.218 ± 0.163
Previous malignancy	3 (2,3)	0.267± 0.142
Previous Kidney transplant	2 (2,3)	0.227 ± 0.136
BMI		
Underweight (<18.5)	3 (2,3)	0.236 ± 0.153
Normal (18.5-24.9)	2 (2,3)	0.204 ± 0.128
Overweight (25.0-29.9)	2.5 (2,3)	0.221 ± 0.141
Obese 1 (30.0-34.9)	3 (2,3)	0.241 ± 0.127
Obese 2 (35.0-39.9)	3 (2,3)	0.251 ± 0.159
Obese 3 (>= 40.0)	3 (2,4)	0.182 ± 0.123

ESRD: end stage renal disease, DM: diabetes, GN: glomerulonephritis, HD: hemodialysis, PD: peritoneal dialysis, CAPD: continuous ambulatory PD, CCPD: chronic cycling PD, CAD: coronary artery disease, CHF: congestive heart failure, CVD: cerebrovascular disease, PVD: peripheral vascular disease
*Using predefined cutoffs of ≥ 4 for the CFS and ≥ 0.25 for the FI

Table S5. Clinical factors associated with frailty as measured by the FI, and CFS treated as continuous variables

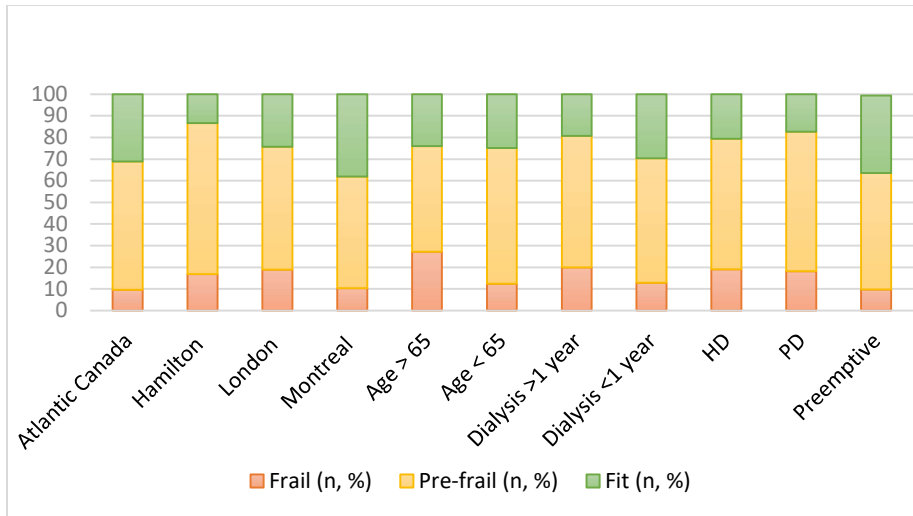
Variable	FI	CFS
	Adjusted beta coefficient (95% confidence interval)	Adjusted beta coefficient (95% confidence interval)
Age>65	0.0128 (-0.0123, 0.0378)	0.299 (0.108, 0.490)
Male sex	-0.0223 (-0.0443, -0.0005)	-0.199 (-0.367, -0.031)
DM	0.0674 (0.0454, 0.0894)	0.328 (0.160, 0.496)
CAD	0.0438 (0.0143, 0.0733)	0.143 (-0.081, 0.368)
CHF	0.0627 (0.0389, 0.0865)	0.022 (-0.160, 0.203)
CVD	0.0808 (0.0402, 0.1215)	0.389 (0.081, 0.697)
PVD	0.0135 (-0.0275, 0.0545)	0.163 (-0.148, 0.474)
Chronic lung disease	-0.0017 (-0.0421, 0.0386)	0.248 (-0.062, 0.557)
Chronic liver disease	0.0037 (-0.0392, 0.0465)	0.135 (-0.194, 0.464)
Dialysis vintage > 1 year	0.0211 (-0.0003, 0.0425)	0.421 (0.083, 0.585)
DM: diabetes, CAD: coronary artery disease, CHF: congestive heart failure, CVD: cerebrovascular disease, PVD: peripheral vascular disease		

Table S6. Agreement between frailty assessment tools represented as kappa coefficients for the sensitivity analysis population

Assessment tools	Kappa coefficients	Simple agreement
FP vs FI	0.404	0.799
FP vs FI32	0.206	0.714
FP vs CFS	0.232	0.809
FI37 vs CFS	0.302	0.764
FI32 vs CFS	0.308	0.750
WT vs FP	0.554	0.875
FP: frailty phenotype, FI: frailty index, FI32: Frailty Index with Frailty Phenotype components removed, CFS: clinical frailty scale, WT: walk time Using predefined cutoffs of ≥ 4 for the CFS, ≥ 0.25 for the FI, and the FP definition for impaired walktime		

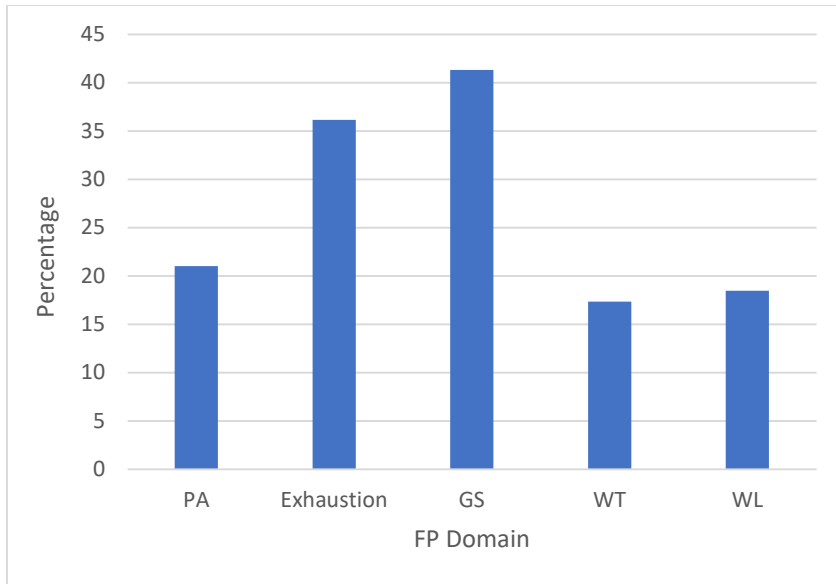
Table S7. Diagnostic characteristics of frailty screening tools for the sensitivity analysis population

	Sensitivity*	Specificity*	PPV*	NPV*	AUC
FI vs FP	0.750	0.807	0.393	0.951	0.837 (0.767, 0.908)
FI34 vs FP	0.594	0.771	0.302	0.919	0.783 (0.702, 0.864)
FI32 vs FP	0.563	0.740	0.265	0.910	0.734 (0.642, 0.827)
CFS vs FP	0.156	0.963	0.417	0.870	0.693 (0.601, 0.784)
WT vs FP	0.719	0.927	0.622	0.952	0.889 (0.823, 0.955)
PPV: positive predictive value, NPV: negative predictive value, FI: frailty index, FP: frailty phenotype, FI34: Frailty Index including only data able to be acquired remotely, FI32: Frailty Index with Frailty Phenotype components removed, CFS: clinical frailty scale, WT: walk time *Using predefined cutoffs of ≥ 5 for the CFS, ≥ 0.25 for the FI, and the FP definition for impaired walktime					



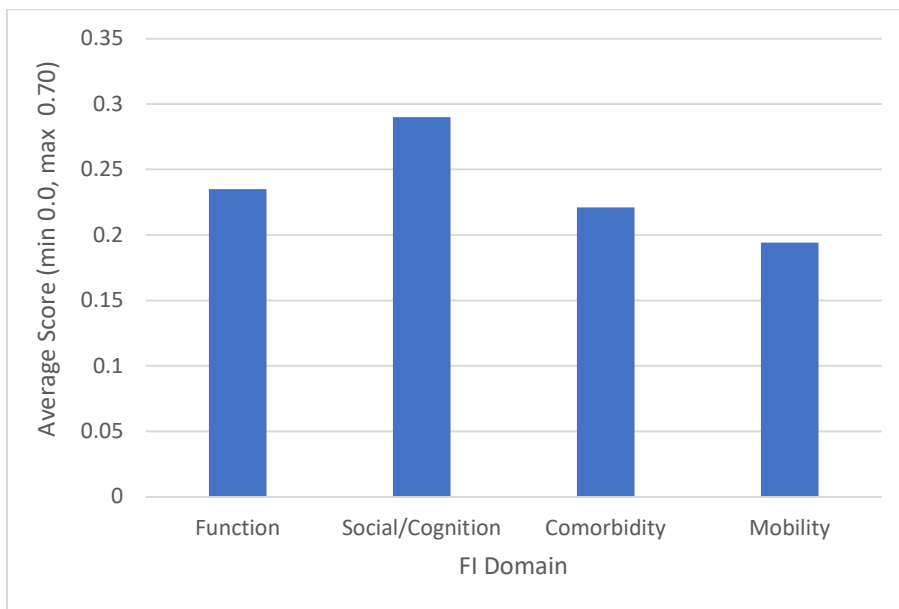
HD: Hemodialysis, PD: Peritoneal Dialysis

Figure S1. Prevalence of frailty by FP among subgroups



PA: Physical activity, GS: Grip strength, WT: Walk time, WL: Weight loss

A)



B)

Figure S2. Prevalence of individual components of the Frailty Phenotype (A) as well as mean FI scores by domain (B)