* Risk factors or causes of frailty among CKD patients.

	Effect (descriptions)	Risk Difference	CKD Severity	Frailty Assessment	Sample Size	Reference
Biological						
Cardiovascular	Cerebrovascular Accident	OR 1.55 (1.05-2.99)	CKD stage 5D (hemodialysis)	Fried Phenotypes	2275	(Johansen, Chertow, Jin, &Kutner, 2007)
	Vascular Access failure	HR 2.63 (1.03-6.71)	ESRD (CKD stage 5D)	Self-reported simple FRAIL scale	51	(Chao, Chiang, Huang, &Hung, 2017)
	Permanent Vascular Access (fistula or graft)	HR 0.71 (0.51-0.98)	CKD stage 5D (maintenance hemodiaysis)	Fried Phenotypes	2275	(Johansen et al., 2007)
Renal Function Decline	Risk for death or dialysis therapy	2.5 (1.4-4.4)-fold greater	CKD stages 1-4	Fried Phenotypes	336	(Roshanravan et al., 2012)
Immunological	Mycophenolate mofetil (MMF) dose reduction (MDR)	HR 1.29 (1.01-1.66)	CKD stage 5T	Fried Phenotypes	525	(McAdams-Demarco, Law, et al., 2015)
Cognitive	Modified Mini-Mental State (3MS)	-2.37 to -2.80 (1 year) (p=0.03)	ESRD	Fried Phenotypes	324	(McAdams-Demarco, Tan, et al., 2015)

			Declined, 1-4 years post-KT (points/week)	Slope = -0.04 vs. 0.005	CKD stage 5T	Fried physical frailty phenotypes (PFP)	665	(Chu, Gross, et al., 2019)
			At 4 year post-KT (points)	-5.5 (87.4 vs. 92.9)				
	Diabetes	Diabetes		OR 1.35 (1.10-1.65)	CKD stage 5D	Fried Phenotypes	2275	(Johansen et al., 2007)
	Body composition	Bones						
			Bone Mineral Density (BMD)	One year follow-up, with frailty	ESRD CKD stage 5D (chronic hemodialysis)	Simple FRAIL Scale (SFS)	43	(Chao, Huang, &Chan, 2017)
			L1	ß = −0.4, t =−2.18, p=0.04				
			L4	ß =−0.39, t =−2.1, p=0.046				
			Femur Neck (FN)	ß =−0.5, t= −2.96, p<0.01				
			Total	ß = −0.53, t =−3.27, p<0.01				
			Areas	One year follow-up, with frailty				
			Average L-spine areas	ß = −0.48, t =−2.84, p < 0.01				

		Changes of average L-spine areas	ß = −0.5, t =−3.02, p<0.01				
		Z-score	One year follow-up, with frailty				
		Percentage change of L1 Z-score	ß = −0.45, t =−2.11, p=0.049				
		Muscles					
		Quadriceps muscle area (magnitude of association with PbF vs. 10 years of age)	Multivariable coefficient -30.3 cm^2 (p = 0.02) vs. -6.6 cm^2 (p = 0.0001)	CKD stage 5D (hemodialysis)	Performance-based frailty (PbF)	80	(Delgado, Doyle, &Johansen, 2013)
	Laboratory data	Serum Albumin Concentrations (g/dL)					
		<3.2 vs. ≥3.9	OR 1.89 (1.30-2.59)	CKD stage 5D	Fried Phenotypes	2275	(Johansen et al., 2007)
		Hypoalbuminemia	Negative association (p = 0.01)	CKD stage 5D (maintenance hemodialysis) (ESRD)	Simple Frail Scale	46	(Chao et al., 2015)
Psychological							

Delirium	Post-KT delirium	OR 2.05 (1.02-4.13)	CKD stage 5T	Fried Phenotypes	893	(Haugen et al., 2018)
Quality of Life	HRQoL					
	Fair/Poor HRQOL at follow-up (median 9.4 mo)	aOR 2.79 (1.32-5.90)	ESRD CKD stage 5T	Fried Phenotypes	233	(M AMcAdams-DeMarco et al., 2016)
	Worsening HRQOL at follow-up (median 9.4 mo)	aRR 2.91 (1.08-7.80)				
	SF-36					
	Hierarchical regression R^2 change (effects of frailty on HRQoL) in Physical Component Summary (PCS)	29% (p<0.001)	CKD stage 2-4	Fried Phenotypes	168	(S. J.Lee, Son, &Shin, 2015)
	Hierarchical regression R^2 change (effects of frailty on HRQoL) in Mental Component Summary (MCS)	21.3% (p<0.001)				
	SF-12					
	MCS	Effect estimate 0.94 (0.91-0.97) (p<0.01)	CKD stage 5D (peritoneal dialysis, n=129;	The Canadian Study of Health and Aging Clinical Frailty Scale	251	(Iyasere et al., 2016)

		PCS	Effect estimate 0.88 (0.84-0.91) (p<0.01)	hemodialysis, n=122)	(CFS)		
	KDQOL-SF scores in physical and kidney disease-specific HRQoL						
		At KT	↓	CKD stage 5T	Fried Phenotypes	443	(Mara AMcAdams-DeMarco et al., 2018)
		Post-KT	Greater increase				
	Illness Intrusiveness Rating Scale		Effect estimate 1.14 (1.09-1.20)	CKD stage 5D (peritoneal dialysis, n=129; hemodialysis, n=122)	The Canadian Study of Health and Aging Clinical Frailty Scale (CFS)	251	(Iyasere et al., 2016)
	Barthel Index		Effect estimate 0.89 (0.86-.093)				
	Symptom score		Effect estimate 1.23 (1.13-1.34)				
	Hospital Anxiety and Depression Scale		Effect estimate 1.21 (1.11-1.31)				
	Falls		HR 2.1 (1.21-3.92)	CKD stage 5D (hemodialysis)	Fried Phenotypes	205	(Yadla, John, &Mummadi, 2017)

		OR 2.39 (1.22-4.71)	CKD stage 5D (maintenance hemodialysis)	Fried frailty index	762	(Kutner, Zhang, Huang, &Wasse, 2014)
	Time to first fall or fracture requiring medical attention	HR 1.60 (1.16-2.20)	CKD stage 5D (maintenance hemodialysis)	Modified Fried Phenotypes by Bao Y (Bao, Dalrymple, Chertow, Kaysen, &Johansen, 2012).	1646	(Delgado et al., 2015)
Graft Loss	Death-censored graft loss					
	F vs. NF (in patients with depressive symptoms)	aHR 6.20 (1.67, 22.95) vs. 3.16 (0.90, 11.04)	CKD stage 5T	Fried Phenotypes	773	(Konel et al., 2018)
Health-care utilization	Hospitalization/Death	HR 1.56 (1.36-1.79)	CKD stage 5D	Fried Phenotypes	2275	(Johansen et al., 2007)
	Hospitalization	HR 2.06 (1.18-3.58)	CKD stage 5D (hemodialysis)	Fried Phenotypes	205	(Yadla et al., 2017)
		aHR 1.80 (1.4-2.3)	CKD stage 5D (maintenance hemodialysis & peritoneal dialysis)	Adopted	1658	(S.Lee &Kim, 2015)
	Early Hospital Readmission	aRR 1.61 (1.81-	CKD stage 5T	Fried Phenotypes	383	(M.

	(EHR)	2.19) (p=0.002)				A.McAdams-DeMarco et al., 2013)
	Hospital stay (days per year of follow up) (frail with depression vs. frail without depression vs. nonfrail)	26.62 (IQR 10.65-61.18) vs. 14.05 (IQR 3.57-37.27) vs. 8.04 (IQR 0.91-19.42) (p<0.0001)	CKD stage 5D (peritoneal dialysis)	In-house Chinese questionnaire	178	(Szeto et al., 2018)
	Duration	Severe vs. moderate vs. mild vs. none frail				
	Days per year	58.5 vs. 27.4 vs. 10.2 vs. 18.3 (p < 0.0001)	CKD stage 5D (peritoneal dialysis)	Chinese questionnaire	193	(Ng et al., 2016)
	Days per hospital admission	12.9 vs. 10.0 vs. 5.3 vs. 6.4 (p < 0.001)				
	Longer Length of Stay (LOS)					
	with delayed graft function (DGF), LOS	Relative Risk 1.15 (1.03-1.29)	CKD stage 5T	Fried Phenotypes	589	(Mara AMcAdams-DeMarco et al., 2017)
	With DGF, LOS ≥2 weeks	OR 1.57 (1.06-2.33)				

	≥2 weeks		CKD stage 5 to 5T	Fried Phenotypes	569	(Chu, Deng, et al., 2019)
	Change in 3 categories (more frail)	OR 2.02 (1.20-3.40)				
	Change in frailty scores (more frail)	OR 1.92 (1.13-3.25)				
	With depressive symptoms (aRR difference between F and NF)	aRR 1.88 (1.70-2.08) vs. 1.38 (1.27-1.52)	CKD stage 5T	Fried Phenotypes	773	(Konel et al., 2018)
	CES-D score (10-point increase) (aRR increase between F and NF)	aRR 1.23 (1.16-1.31) vs. 1.17 (1.08-1.27)				
Mortality	Mortality	2.17 fold	CKD stage 5T	Fried Phenotypes	537	(M AMcAdams-DeMarco et al., 2015)
		HR 1.22 (1.04-1.43)	CKD stage 5D (incident chronic dialysis)	CFS	390	(Alfaadhel et al., 2015)
		HR 4.28 (1.22-14.98)	Predialysis (eGFR ≤ 25 mL)	PRISMA questionnaire & Timed up and Go test	104	(Ali, Abdelaziz, Abdelaal, &Baharani, 2018)

		aHR 9.83 (1.80-53.7)	CKD stage 5D (peritoneal dialysis)	Clinical Frailty Scale (CFS)	119	(Kamijo, Kanda, Ishibashi, &Yoshida, 2018)
		20.45% vs. 12.36% (p<0.005)	CKD stage 5D (hemodialysis)	Fried Phenotypes	320	(Bancu et al., 2017)
	F vs. NF (in patients with depressive symptoms)	aHR 2.62 (1.03, 6.70) vs. 1.92 (0.68, 5.38)	CKD stage 5T	Fried Phenotypes	773	(Konel et al., 2018)
	At 24-month follow up, frail with depression vs. frail without depression vs. nonfrail	62.5% vs. 71.4% vs 86.6% (p=0.001)	CKD stage 5D (peritoneal dialysis)	In-house Chinese questionnaire	178	(Szeto et al., 2018)
	Prediction ability of comorbidities in F vs. NF	HR 0.75 (0.44-1.29) vs. 1.66 (1.17-2.35)	CKD stage 5T (KT candidates, on waitlist)	Fried Phenotypes	2086	(Pérez Fernández et al., 2019)
All-cause mortality						
	Adjusted	HR 1.66 (1.03-2.67)	CKD stage 5D (incident chronic dialysis)	Fried Phenotypes	370	(Fitzpatrick et al., 2019)
	Among BMI ≥30 kg/m^2	HR 3.77 (1.10-12.92)				

	Above median Waist-Hip Ratio (WHR)	HR 2.38 (1.17-4.82)				
	Post-KT mortality					
	Change in 3 categories (more frail)	HR 2.27 (1.11-4.65)	CKD stage 5 to 5T	Fried Phenotypes	569	(Chu, Deng, et al., 2019)
	Change in frailty scores (more frail)	HR 2.36 (1.12-4.99)				
Composite	Composite outcomes of all-cause death or cardiovascular hospitalization	HR 23.58 (1.61-346.03)	CKD stage 5D ESRD	Multidimensional frailty score based on comprehensive geriatric assessment (CGA) protocol	46	(S. W.Lee et al., 2017)

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