

	Related adverse health effects		RR/OR/HR/p-value	Reference
Frailty Among CKD Patients	Cause/coexistence of /with frailty	Sarcopenia	(1) Model: CKD→ 1/3 patients of ESRD anorexia; physical inactivity; inflammation; metabolic acidosis with →lower uptake of energy→sarcopenia→frailty (2) 互相影響	(1) Nixon et al, 2018. (2) Johansen, K. L., Delgado, C., Bao, Y., & Tamura, M. K. (2013). Frailty and dialysis initiation. In Seminars in dialysis (Vol. 26, pp. 690–696). Wiley Online Library.
		Acidosis (inducing 1. sarcopenia [caspase-3 and the ubiquitin proteasome system, inhibits intracellular signalling of insulin and IGF-1 and increases adrenal glucocorticoid production] and 2. pain + itch [ASIC3 and TDAG8])	(1) (We further adjusted for comorbid conditions that we had hypothesized to be related to frailty (diabetes, arthritis, cancer, chronic liver disease, and chronic lung disease) but not caused by chronic kidney disease.) (In subsequent analyses, we also adjusted for factors that often complicate chronic kidney disease to potentially explain any association identified between chronic kidney disease and frailty. These factors included sarcopenia (estimated using bioelectrical impedance analysis parameters), anemia (hemoglobin concentration), acidosis (serum bicarbonate concentration), inflammation (C-reactive protein concentration), vitamin D deficiency, and overt cardiovascular disease, as described above.) (2) Acidosis是sarcopenia以及frailty的关键 contributor	(1) Wilhelm-Leen, Hall, M, & Chertow, 2009 (2) Nixon et al., 2018
		Kt/V (dialysis adequacy) p.s. dialysis clearance rate = Kt/V + urea reduction ratio	(1) 跟frailty一起测 · moderately to severely frail patients have higher dialysis clearance rates. (2) RR=1.1-1.5	(1) Chao, C.-T., Lai, H.-J., Tsai, H.-B., Yang, S.-Y., & Huang, J.-W. (2017). Frail phenotype is associated with distinct quantitative electroencephalographic findings among end-stage renal disease patients: an observational study. BMC Geriatrics, 17(1), 277. (2) Yadla, John, & Mummadi, 2017.
	Physical/ Physiological Changes	CVD		
		CHF		
		Brain wave	(1) moderate to severe frailty had significantly lower global DAR (the former vs. the latter, 283 ± 679 vs. 2971 ± 4859, p = 0.02), and DARs of the left frontal (135 ± 250 vs. 3073 ± 4702, p = 0.01, left TO (197 ± 318 vs. 3708 ± 6398, p = 0.02), central (55 ± 96 vs. 1773 ± 3262, p = 0.03), and right TO (187 ± 261 vs. 4400 ± 7763, p = 0.02), compared to those with none to mild frailty, except in the right frontal area. Similarly, those with moderate to severe frailty had significantly lower global DTABR (the former vs. the latter, 191 ± 469 vs. 1781 ± 2793, p = 0.02), and DTABRs of the left frontal (86 ± 158 vs. 1680 ± 2388, p < 0.01, left TO (130 ± 210 vs. 1884 ± 2828, p = 0.01), central (39 ± 65 vs. 1132 ± 1957, p = 0.02), and right TO DTABR (126 ± 178 vs. 2960 ± 5271, p = 0.03) than those with none to mild frailty, except in the right frontal area. Overall p=0.02.	(1) Chao, C.-T., Lai, H.-J., Tsai, H.-B., Yang, S.-Y., & Huang, J.-W. (2017). Frail phenotype is associated with distinct quantitative electroencephalographic findings among end-stage renal disease patients: an observational study. BMC Geriatrics, 17(1), 277.
		HTN, CVA, LVD, PVD, smoking, IDH, serum creatinine, and hemoglobin	(1) RR 1.1-1.5	(1) Yadla, John, & Mummadi, 2017
		Uraemia	(1) Uremia (malnutrition, anemia, metabolic acidosis, fluid overload) → Frailty (weight loss, exhaustion, weakness, low physical activity)	(1) Johansen, K. L., Delgado, C., Bao, Y., & Tamura, M. K. (2013). Frailty and dialysis initiation. In Seminars in dialysis (Vol. 26, pp. 690–696). Wiley Online Library.
	Biochemical	Inflammatory chemicals		
	Psychosocial	Mood	(1) The Edmonton Frail Scale	(1) Orlandi & Gesualdo, 2014
		Good interaction with family	(1) Interview	(1) Moffatt, Moorhouse, Mallery, Landry, & Tennankore, 2018
		Cognitive impairments	(1) p ≤ 0.05 (2) RR很多，之后回来读 (3) 3MS P = 0.03	(1) McAdams-DeMarco et al., 2015 (2) Kritskulnair, P. et al. (2016). Consequences of CKD on Functioning. Seminars in Nephrology, 36(4), 305–318.
		Depression (Beck dep. scale)	(1) 幾乎都當作是平行存在 · 需要消除的因子 (2) P ≤ 0.05	(2) Adame Perez, S. I. et al. (2018). Frailty, Health-Related Quality of Life, Cognition, Depression, Vitamin D and Health-Care Utilization in an Ambulatory Adult Population with Type 1 or Type 2 Diabetes Mellitus and Chronic Kidney Disease: A Cross-Sectional Analysis. Canadian Journal of Diabetes.
		HRQOL	(1) Narrative only (2) between frail and non-frail p ≤ 0.001 (Persons ≥ 75 years old and those with depressive mood or lower creatinine clearance had significantly lower WHOQOL-26 scores than their counterparts.) (3) P ≤ 0.05	(1) Soni, Weisbord, & Unruh, 2010 (2) Kanauchi, Kubo, Kanauchi, & Saito, 2008 (3) Adame Perez, S. I. et al. (2018). Frailty, Health-Related Quality of Life, Cognition, Depression, Vitamin D and Health-Care Utilization in an Ambulatory Adult Population with Type 1 or Type 2 Diabetes Mellitus and Chronic Kidney Disease: A Cross-Sectional Analysis. Canadian Journal of Diabetes
	Other adverse effects	Nosocomial infections	Heuberger, 2011: RR = 2.1, 1.1-3.8, p < 0.001 (in frail, further increase with cancer)	
		Viral infection - HCV	(1) P = 0.04 (Frailty in those with serological infections due to hepatitis B and hepatitis C was found in 14/15 patients and 36/37 patients, respectively (P = 0.31 and P = 0.004).)	(1) Yadla, John, & Mummadi, 2017
		Hospitalization	(1) higher numbers of health visits (total, inpatient and emergency) compared with nonfrail participants (p<0.05). No differences in health-care visit types was noted between frail and nonfrail participants (p>0.05).	(1) Adame Perez, S. I. et al. (2018). Frailty, Health-Related Quality of Life, Cognition, Depression, Vitamin D and Health-Care Utilization in an Ambulatory Adult Population with Type 1 or Type 2 Diabetes Mellitus and Chronic Kidney Disease: A Cross-Sectional Analysis. Canadian Journal of Diabetes.