Table S2. Instrument validity and reliability testing.[a]

Instrument	Content validity	Construct validity[b]	Internal consistency reliability	Test-retest reliability	Responsiveness[c]
Developed in dialysis populations					
100 Category Checklist[61, 72]	Patient review ♦ Expert review	r= -0.24- -0.32 (p<0.05) for 9 of 40 body function categories and KDQOL kidney disease-targeted scales ♦■ Higher body function scores in patients with anemia (p<0.01) and higher body structure scores in patients with secondary hyperparathyroidism (p=<0.01) vs. in patients without ♦■ *[known groups validity]*	Cronbach's α=0.78 for body function, 0.50 for body structure, and 0.86 overall ♦■	NR	NR
CHOICE Health Experience Questionnaire (CHEQ)[13, 73]	Structural literature review Patient focus groups ♦ Patient review ♦ Expert review[13]	Symptoms score=76 for PD and 78 for HD patients (p=NS) Symptom scores=79 for ICED= 0-1, 75 for ICED=2, and 77 for ICED=3 (p=NS) Sex score=67 for HD and 58 for PD patients (p≤0.01)[13] ♦■ *[known groups validity]*	Cronbach's α >0.7 for all multi-item scales except for time and quality of life ♦ ICC=0.81 (symptoms)[73] ♦■	ICC= 0.55-0.79 (baseline, 1 year)[73] ♦	NR
Curtin, *et al.*[63]	Literature review Patient interview[63] ♦	r= -0.061- -0.460 (p<0.05) for >75% of instrument symptoms and MOS SF-36 PCS[63] ♦■	Cronbach's α=0.78 for fatigue/sleep sub-index and 0.89 for sexual concerns sub-index[63] ♦■	NR	NR
Dialysis Symptom Index (DSI)[19]	Patient focus group ♦ Provider focus group Existing instrument review Patient review ♦ Expert review[19]	NR	NR	Kappa= 0.06-0.90 (mean 0.48 ± 0.22)[19] ♦■	NR
Fluid Management Survey[53]	Patient focus group ♦ Expert review Patient review[53] ♦	NR	Cronbach's α 0.72 (fluid-related symptoms)[53] ♦■	Kappa= 0.53-0.88 (baseline, 2 weeks)[53] ♦	NR
Hemodialysis Quality of Life Questionnaire (HQL)[14, 64]	Patient interviews ♦ Expert interviews Patient review[14] ♦	NR	NR	ICC 0.91-0.95 (p<0.001 for all) for 5 domains (baseline, 6-8 weeks)[14] ♦■	RR= 7.94 (Z=2.07)[d] for boredom; other symptoms non-significant (Kt/V <0.8, improve to Kt/V >1.0)[14] ♦■

Instrument	Content validity	Construct validity[b]	Internal consistency reliability	Test-retest reliability	Responsiveness[c]
					ANOVA p<0.05 for dizziness, nausea, chest pain; other symptoms non-significant (conventional vs. high-flux dialysis)[64] ♦■
Kidney Disease Quality of Life Instrument (KDQOL)[12, 74-77]	Literature review Patient focus groups ♦ Expert focus groups[12]	F=22.5 for energy/fatigue and F=17.8 for symptom/problems scale displaying sensitivity to differences in the number of good days reported in a typical week[f] [78] ♦■ *[known groups validity]* r=0.62 for KDQOL symptoms/ problems and EuroQOL overall health rating; r=0.76 for KDQOL overall health rating and EuroQOL overall health rating (p<0.05 for both)[74] ♦■ p<0.05 for symptoms/problems correlation with serum albumin (r=0.14) and change in GFR (r=0.17) (3m, 12m after dialysis initiation)[74] ♦■	Cronbach's α 0.80 for symptom/ problems scale[74] ♦■ Cronbach's α 0.69 for dialysis-related symptoms; 0.79 for cardiopulmonary symptoms; 0.82 for sleep; 0.92 for energy; 0.73 for cramps; 0.66 appetite[75] ♦■	NR	X^2 p>0.20 for differences in sexual questions baseline to 6 months for nocturnal HD (vs. conventional HD)[76] ♦■ Wilcoxon rank test p=0.50 for symptom score change and paired t-test p=0.03 for energy/fatigue from baseline to weeks 7 and 11 among HD patients treated with acupuncture[77] ♦■
Kidney Disease Questionnaire (KDQ)[11, 15, 65, 66]	Patient interviews ♦ Expert interviews[15]	r= -0.31 (p<0.01) for KDQ physical symptoms with Sickness Impact Profile physical component[15] ♦■	reliability scores[e] >0.70 for all 5 dimensions[66] ♦■	ICC 0.85 (physical symptoms and fatigue) (baseline, 2 months)[15] ♦■	ANOVA p<0.001 improvement in physical symptoms and fatigue in ESA-treated (vs. placebo)[11, 15] ♦■ ANOVA p<0.005 improvement in weakness, low energy, felt worn out, sluggish, and difficulty because of little strength in ESA-treated group (vs. placebo)[65] ♦■
Modified Edmonton	Patient survey[79] ♦	r= -0.69 (p<0.01) for overall symptom distress and KDQOL-SF symptom list	Cronbach's α 0.61-0.81[48] ■	ICC= 0.53-0.71 (baseline, 1 week)[5] ♦■	r= -0.73 (p<0.01) for change in overall symptom distress

Instrument	Content validity	Construct validity[b]	Internal consistency reliability	Test-retest reliability	Responsiveness[c]
Symptom Scale (mod-ESAS)[5, 48, 49, 79, 80]		r= -0.19 - -0.56 (p<0.01) for ESAS-listed symptoms and KDQOL-SF physical health composite and r= -0.22 - -0.62 (p<0.01) for KDQOL-SF mental health composite[5] ♦■	Overall Cronbach's α 0.79[49] ■ *[both for non-modified Edmonton symptom scale]*		score and change in KDQOL-SF symptom list (baseline, 6m)[80] ♦■
National Kidney Dialysis and Kidney Transplantation Study (NKDKTS)[16, 67]	Patient review ♦ Patient interviews[16] ♦	ANOVA p=0.02 across patients with different hemoglobin levels at different time-points, patients with lower hemoglobin had lower scores[67] ♦■ *[known groups validity]*	Cronbach's α 0.86 at baseline, 0.89 at 48 hours, 0.90 at 7 days; Cronbach's α decreased if any item was removed[67] ♦■	ICC 0.59-0.82 (p<0.001) (baseline, 2 days)[67] ♦■	NR
Parfrey Symptom Assessment[17]	Patient interviews ♦ Patient review[17] ♦	ANOVA p=0.004 for symptom score difference between transplant and dialysis patients[17] ♦■ *[known groups validity]*	NR	NR	Symptom scores improved post-transplant (p=0.007)[17] ♦■
Physical Symptom Distress Scale[68]	Literature review Expert review[68]	r= -0.46 (p<0.0001) for overall scale and the KPS[68] ♦■	Cronbach's α 0.87[68] ♦	ICC= 0.82 (baseline, 2 weeks)[68] ♦■	
Short-Version Checklist[62]	Patient review ♦ Expert review	r= 0.23- 0.43 (p<0.05) for 8 of 17 body function categories and KDQOL kidney disease-targeted scales ♦■ Higher body function scores in patients with carpal tunnel syndrome (p<0.05) and patients with anemia (p<0.01) and higher body structure scores in patients with carpal tunnel syndrome (p<0.01) and patients with anemia (p<0.05) vs. in patients without ♦■ *[known groups validity]*	Cronbach's α=0.79 overall ♦■	NR	NR
Developed in non-dialysis populations					
Bowel Disease Questionnaire[81, 82]	Expert review Patient review[82]	NR	NR	Kappa= 0.56-0.86 (baseline, 1 week, and 7 weeks)[81]	NR
European Organization for Research and	Expert consensus[83]	r= 0.05- 0.35 (0.22, p<0.05 for fatigue and 0.35 for sleep disturbance, p<0.01) for EORTC-QLQ symptoms and HADS	Cronbach's α 0.86 (fatigue, pain, nausea/vomiting)[84] ■	NR	NR

Instrument	Content validity	Construct validity[b]	Internal consistency reliability	Test-retest reliability	Responsiveness[c]
Treatment of Cancer Quality of Life Questionnaire (EORTC-QLQ-C30)[20, 83, 84]		anxiety composite and r= 0.02- 0.38 (0.34 for fatigue, 0.28 for dyspnea, 0.38 for sleep disturbance, all p<0.01) for HADS depression composite[84] ■			
McGill Quality of Life Questionnaire (MQOL)[18, 85, 86]	Literature review Expert experience Patient interviews[18]	r=0.56 (p=0.0005) for physical symptom subscale and Spitzer's health item[18] ■	Cronbach's α 0.70[18] and 0.62[85] for physical symptom subscale ■	ICC 0.69 for physical symptom subscale (baseline, 2 days)[86] ■	NR
Memorial Symptom Assessment Scale (MSAS)[23, 87]	Literature review[23]	r=0.87 for distress scores, r=0.85 for frequency scores, and r=0.84 with validation measures- FLIC, RAND distress, RAND well-being, KPS and mood VAS[23] ■ r= -0.66 for MSAS-GDI (4 psychological and 6 physical symptoms) and RAND well-being; r=0.79 for RAND distress; r= -0.60 for KPS[23] ■ MSAS-GDI scores= 0.93 for outpatients and 1.53 for inpatients (p<0.001)[23] ■ *[known groups validity]*	Cronbach's α 0.88 (12 physical symptoms), 0.84 (pain symptoms), 0.75 (gastrointestinal distress), 0.58 (15 physical symptoms distinguished from other symptoms based on low frequency)[23] ■ Cronbach's α 0.84 (all questions); 0.65-0.75 (sub-scales)[87] ♦■	NR	NR
Nottingham Health Profile (NHP)[21, 45, 88]	NR	r >0.7 for energy (NHP) and physical symptoms and fatigue from KDQ[45] ♦■	Cronbach's α 0.64-0.79[45] ♦	r= 0.61-0.84 (baseline, 2 weeks)[45] ♦■	McNemar p=0.001 for energy, p=0.25 for pain, and p=0.12 for sleep between baseline and 2nd follow-up among HD patients treated with ESA[88] ♦■
Palliative Care Outcome Symptom Scale-Renal (POS-S Renal)[69]	Literature review Patient interviews Expert interviews Patient review[69]	r= 0.51 (p=0.005) POS and EORTC QLQ-C30 physical symptoms[69]	Cronbach's α 0.65[69]	Kappa= 0.10-0.43 for symptom-related items (consecutive visits, interval time not specified)[69] ■	NR
Quality of Life at the End of Life (QUAL-E)[89, 90]	Patient interviews ♦ Family interviews Patient review ♦	r= 0.23 (p<0.01) QUAL-E symptoms and FACIT physical well-being subscale[90] ♦	Cronbach's α 0.87 for symptom impact[90] ♦■	ICC=0.23 for symptom impact (baseline, 1 week)[90] ♦■	NR

Instrument	Content validity	Construct validity[b]	Internal consistency reliability	Test-retest reliability	Responsiveness[c]
	Family member review Expert review[89, 90]	r= -0.12 (p=NS) QUAL-E symptoms and Missoula-VITAS QOL Index symptom subscale[90] ♦			
Quality of Well Being Self-Administered Scale (QWB-SA)[70, 91-94]	NR	r= -0.45 (p<0.01) QWB-SA and Sickness Impact Profile total score[70]	NR	r=0.77 (baseline, 1 month)[92] r=0.80-0.97 (day 1, day 2)[94]	NR
Rotterdam Symptom Checklist (RSCL)[22, 71, 95, 96]	Literature review Expert review[71]	r= -0.67 (p=0.001) RSCL physical symptom distress and Medical Outcome Study (MOS-20) physical function[71]	Cronbach's α 0.82 for physical distress scale[22] ■ Cronbach's α 0.68-0.85 at baseline[95]	NR	NR
Symptom Distress Scale (SDS)[23, 44, 97-100]	Literature review Patient interviews[97]	r=0.60 (p==x) SDS and Sickness Impact Profile[99] ■ r=0.65 (p=x) SDS and KPS[100] ■ p<0.002: more symptom distress in hospitalized vs. non-hospitalized patients and p<0.0001 in low vs. high performance status[23] ■ *[known groups validity]*	Cronbach's α 0.70-0.92 in over 40 studies in different populations[44] ■	ICC=0.78 (baseline, 1 month)[44] ■	NR

[a] Results for symptom-specific domains and questions reported when available. ESRD population specific data reported when available.
[b] Construct validity reported as congruent validity unless otherwise noted.
[c] Responsiveness to change reported only when tested in a dialysis population.
[d] Relative risk of an increase of 1 unit for patients with an increase in Kt/V from <0.8 to >1.0 compared to those with stable Kt/V >1.0.
[e] Type of reliability score not characterized.
[f] F-ratios from 1-way ANOVA with KDQOL subscales for 6 different known group classifications.

♦ = tested in a dialysis population
■ = specifically evaluated for the symptom domain/ questions

Abbreviations: ESRD, end stage renal disease; PD, peritoneal dialysis, NS, non-significant; ICED, index of coexistent disease; MOS SF-36 PCS, Medical Outcomes Study Short Form Physical Component Summary; HADS, Hospital Anxiety and Depression scale; RAND well-being, Revised Rand Mental Health Inventory- positive affect; RAND distress, Revised Rand Mental Health Inventory- psychological distress; KPS, Karnofsky Performance Status Scale.