

Het belang van frailty bij de uitkomst van niertransplantatie

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Disclosure belangen spreker

(potentiële) belangenverstrengeling	Zie hieronder
Voor bijeenkomst mogelijk relevante relaties met bedrijven	Bedrijfsnamen
• Sponsoring of onderzoeksgeld • Honorarium of andere (financiële) vergoeding	• Astellas • Chiesi

Komt een patiënt bij de dokter

- 45-jarige man
- Type I DM (sinds zijn 20^e)
- Kreatinine klaring 20ml/min
- Toenemend vermoeid
- Wie vind dit een geschikte kandidaat voor een niertransplantatie?
- Of wellicht gecombineerde nier-pancreas transplantatie?



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Kunnen we betrouwbare de fysieke (en/of cognitieve) conditie van een patiënt inschatten?



Clinician Estimates of Frailty Compared to Formal Frailty Assessment in Adults With Heart Failure: A Cross-Sectional Analysis

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Table 3 Estimated frailty and formal frailty classification: pooled clinician estimates and stratified by clinician professional group.

	Non-Frail		Pre-Frail		Frail	
	Formal n (%)	Clinician n (%)	Formal n (%)	Clinician n (%)	Formal n (%)	Clinician n (%)
Pooled clinician n=194	42 (21)	88 (44)	102 (51)	77 (39)	50 (25)	29 (15)
Nurse n=109	24 (22)	48 (44)	59 (52)	44 (40)	26 (24)	17 (16)
Physician n=58	12 (21)	24 (41)	30 (52)	26 (45)	16 (28)	8 (14)
Allied health n=26	6 (23)	15 (58)	12 (46)	7 (27)	8 (31)	4 (15)

Note: Comparison of frailty classification (non-frail, pre-frail, and frail) for all clinicians and filtered by clinician profession group is shown. n (%) (Frequency is listed followed by percentage in bracket).

Prospective Evaluation of the Eyeball Test for Assessing Frailty in Patients With Valvular Heart Disease



TABLE 1 Summary of Objective Frailty Data

	F → F	F → NF	NF → F	NF → NF
Handgrip, kg				
Male	21.1	29.8	30.1	40.3
Female	13.9	17.5	12.7	23.1
15-foot walk, s				
Male	12.8	5.2	5.3	4.3
Female	7.2	5.8	5.7	4.5
Katz index	5.21	5.52	5.88	5.97
SF-12 survey				
PCS	21.7	24.9	28.9	38.6
MCS	31.3	34.1	36.8	42.3
Change in frailty score	0.07	-1.57	1.47	-0.21

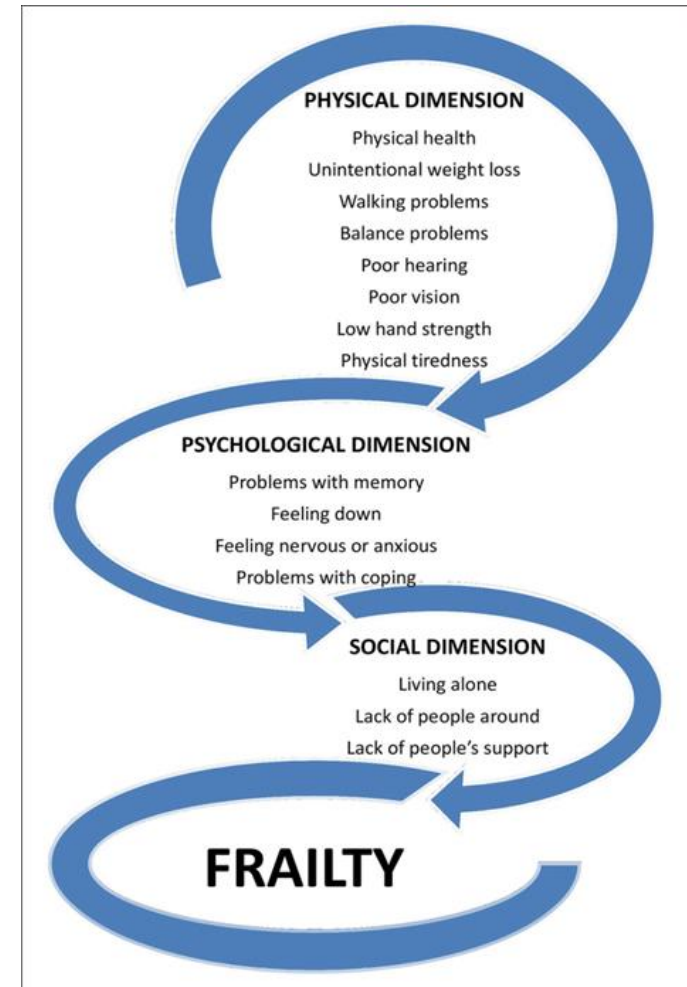
Values are mean. Arrows indicate whether there was a category change (i.e., F → F = patients remained in the F category).

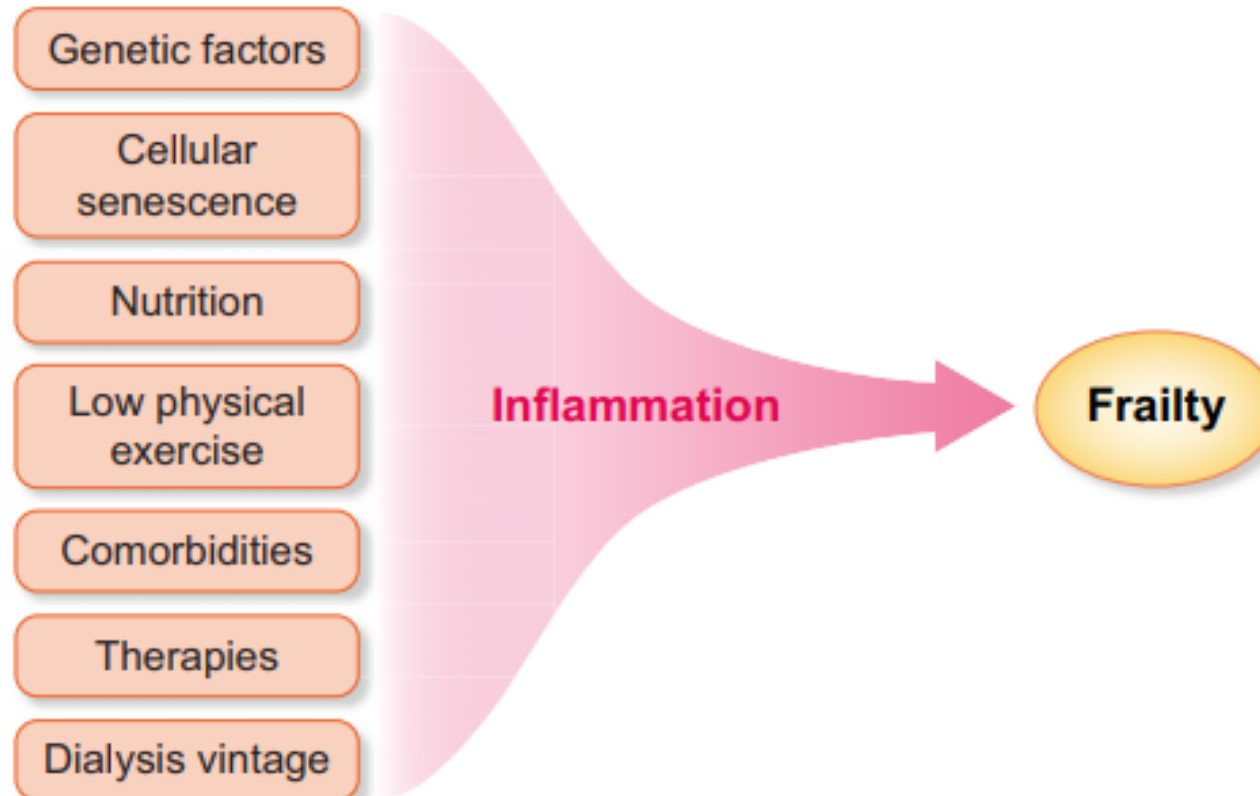
F = frail; MCS = Mental Component Summary; NF = not frail; PCS = Physical Component Summary; SF-12 = 12-Item Short Form Health Survey.

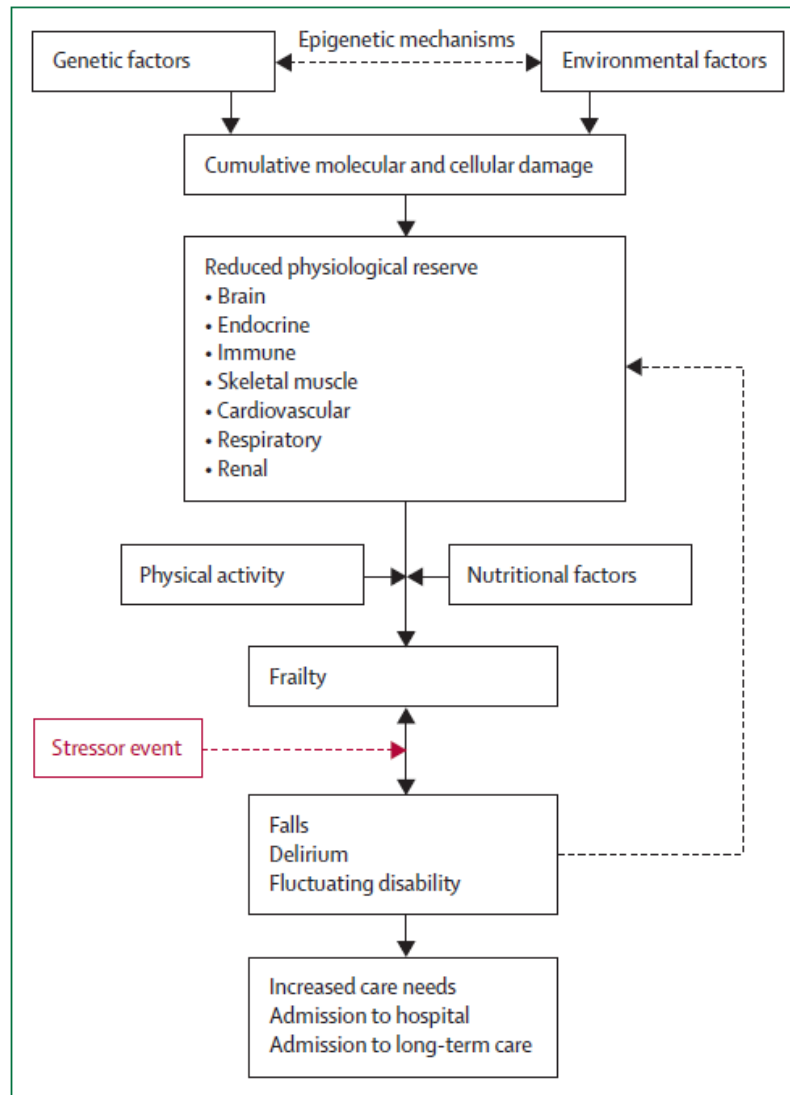


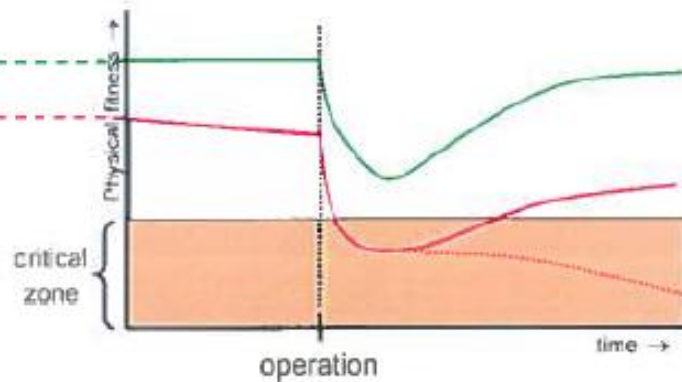
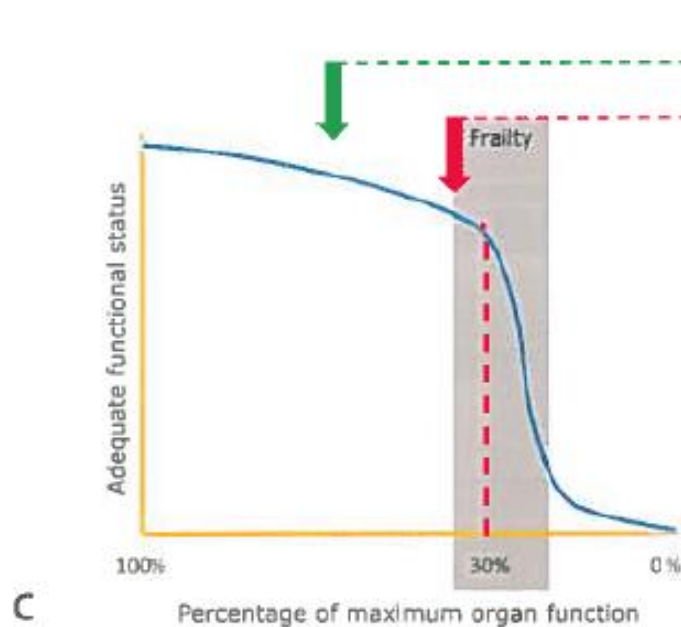
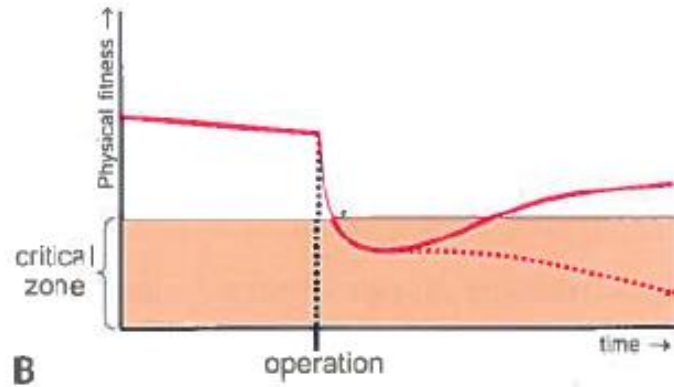
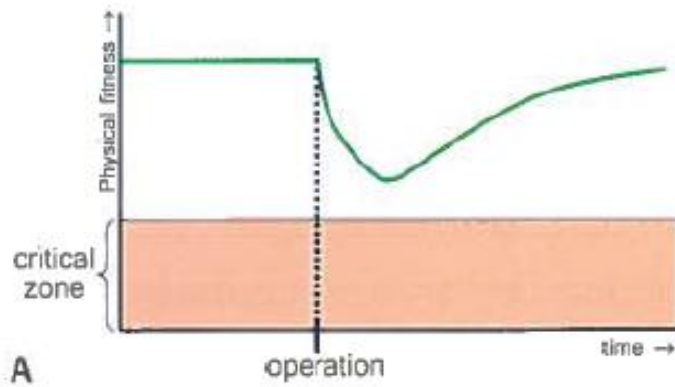
Waarom is deze fysieke en cognitieve conditie ('Frailty') zo belangrijk?

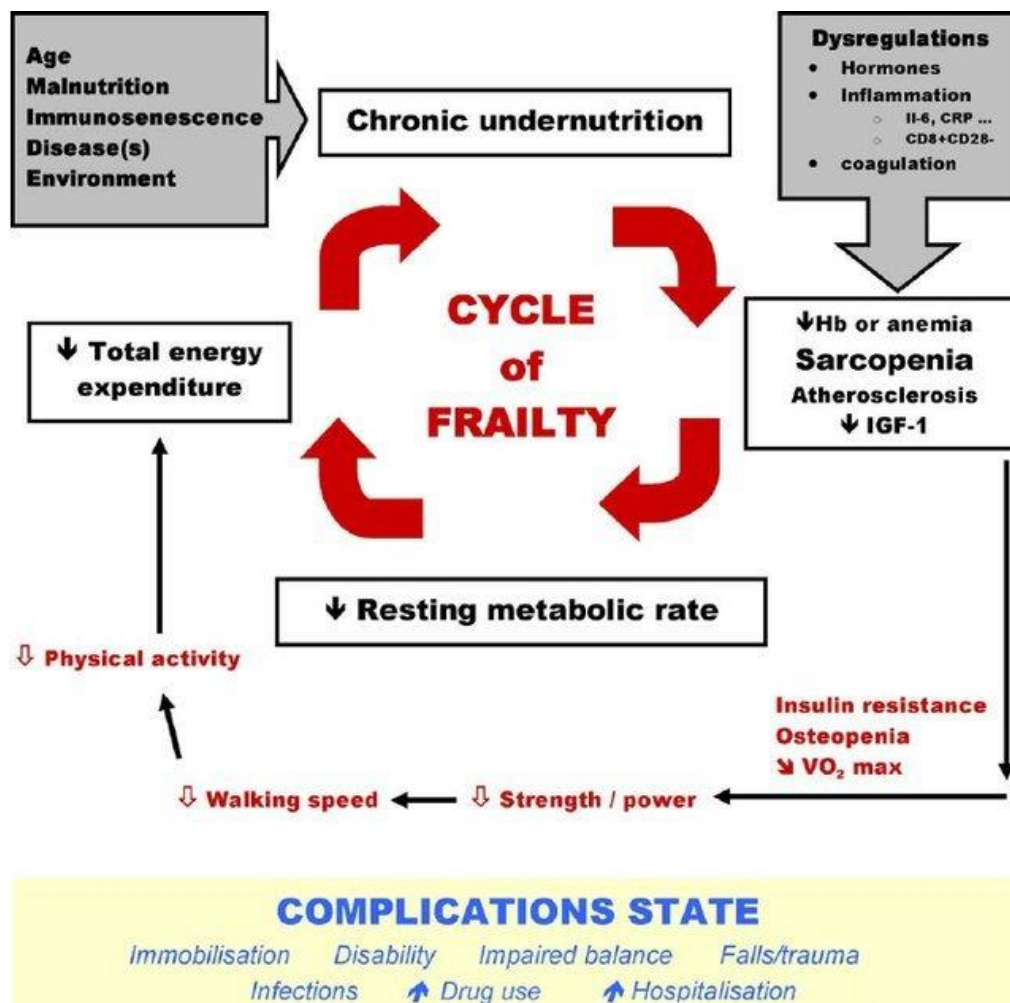
- Frailty is een syndroom dat leidt tot een verhoogde kwetsbaarheid voor ernstige verslechtering van de gezondheid en behelst het verminderde vermogen om met fysieke stressoren om te gaan.
- Het leidt tot een afname in energie, kracht en functie evenals een verhoogde ontstekingsfase (o.a. verhoogde spiegels van Interleukine 6 en CRP).











- Vicious circle of reduced physical functioning and reduced physical activity

Table 3 Multivariate logistic regression for physical activity trajectories for frailty

Parameter	Beta	SE	P	OR	95% Wald confidence limits	
Age	0.7247	0.069	<0.00001	2.064	1.803	2.363
Male (ref: Female)	-0.2881	0.0816	0.0004	0.562	0.408	0.774
DM (ref: No)	0.6883	0.1816	0.0002	1.99	1.394	2.841
Kidney disease (ref: No)	1.233	0.2702	<0.0001	3.432	2.021	5.828
OHIPq3	0.46	0.1814	0.0112	1.584	1.11	2.26
OHIPq7	0.3395	0.1866	0.0688	1.404	0.974	2.024
CESD	1.0923	0.2335	<0.0001	2.981	1.886	4.712
Life Satisfaction	-0.5763	0.0595	<0.0001	0.562	0.5	0.631
Baseline Frailty	2.2359	0.6753	0.0009	9.355	2.49	35.142
Consistently active group (ref: Consistently inactive group)	-1.0023	0.2291	<0.0001	0.367	0.234	0.575
Incline group (ref: Consistently inactive group)	-0.7963	0.2177	0.0003	0.451	0.294	0.691
Decline group (ref: Consistently inactive group)	-0.065	0.2244	0.772	0.937	0.604	1.455

DM=diabetes mellitus. OHIPq3=Oral Health Impact Profile question 3: Are you uncomfortable to eat due to an oral problem in recent 12 months? OHIPq7=Oral Health Impact Profile question 7: Do you experience a worse taste due to an oral problem in recent 12 months? CESD=Center for Epidemiologic Studies Depression Scale. Consistently active group=consistently active in physical activity trajectories. Incline group=incline in physical activity trajectories. Decline group=decline in physical activity trajectories



Frailty componenten (vlgs Fried)

- 5 componenten:
 - Onbedoeld gewichtsverlies van meer dan 5 kg in het afgelopen jaar (op basis van droog gewicht) (zelfrapportage)
 - Zwakte (knijpkracht onder een vastgestelde afkapwaarde, op basis van geslacht en BMI)
 - Uitputting (zelfrapportage)
 - Lage dagelijkse activiteit
 - Vertraagde/verminderde loopsnelheid

Frailty domeinen

- Mobiliteit
- Cognitie
- Visus/gehoor
- Voeding
- Comorbiditeit
- Psychosociaal functioneren
- Lichamelijke fitheid

Frailty assessment tool	Includes items in these frailty assessment domains			Definite construct overlap observed between frailty assessment tool items and DSM-5 diagnostic criteria	Includes items from psychiatric assessment tools
	Physical	Psychological	Other		
Brief Clinical Instrument to Classify Frailty ⁴⁰⁻⁴²	✓		✓		
Brief Frailty Index ⁴³	✓	✓*	✓*	✓	✓
British Frailty Index ⁴⁴	✓*	✓*	✓	✓	
Care Partners-Frailty Index-Comprehensive Geriatric Assessment (CP-FI-CGA) ⁴⁵	✓*	✓*	✓	✓	
Clinical Frailty Scale ⁴⁶⁻⁴⁹	✓		✓		
Clinical Global Impression of Change in Physical Frailty (CGIC-PF) ⁵⁰	✓*	✓*	✓*	✓	
Comprehensive Assessment of Frailty (CAF) ⁵¹⁻⁵³	✓*			✓	
Comprehensive Frailty Assessment Instrument ^{54,55}	✓	✓*	✓	✓	
Continuous Composite Measure of Frailty ⁵⁶	✓*			✓	✓
Deficit-Accumulation Frailty Index (DAFI) ⁵⁷	✓*	✓*	✓*	✓	✓
EASYcare Two-Step Older Persons Screening (EASYcare-TOS) ⁵⁸⁻⁶⁰	✓*	✓*	✓	✓	
Edmonton Frail Scale (EFS) ⁶¹⁻⁶⁴	✓*	✓*	✓	✓	
Electronic Frailty Index (eFI) ⁶⁵	✓*		✓*	✓	
Evaluative Frailty Index for Physical Activity (EFIP) ⁶⁶	✓*	✓*	✓	✓	✓
Frailty Groupe Iso-Resource Evaluation (FRAGIRE) tool ⁶⁷	✓*	✓*	✓	✓	
Frailty Index-Comprehensive Geriatric Assessment (FI-CGA) ^{68,69-70}	✓*	✓*	✓*	✓	✓
Frailty Predicts Death One Year After Cardiac Surgery Test (FORECAST) ^{71,72}	✓		✓		
Frailty Index ⁷²	✓		✓*	✓	
Frailty Index Based on Common Laboratory Tests (FI-LAB) ⁷³	✓				
Frailty Index based on Primary Care Data ^{74,75}	✓*	✓*	✓*	✓	

Frailty Index for Elders (FIFE) ⁷⁶	✓*	✓*	✓*	✓	
Frail Non-Disabled Instrument (FIND) ⁷⁷	✓*			✓	✓
Frailty Screening Tool ⁷⁸	✓		✓*	✓	
FRAIL Scale ⁷⁹	✓*			✓	
Frailty Trait Scale (FTS) ⁸⁰	✓*		✓	✓	
FRESH-Screening Instrument ⁸¹	✓*		✓*	✓	
Groningen Frailty indicator (GFI) ^{41,82-90}	✓*	✓*	✓	✓	
Guilley Frailty Instrument ⁹¹	✓*		✓	✓	✓
Head and Neck Cancer-Specific Frailty Index ⁹²	✓*	✓*	✓	✓	✓
Inactivity and Weight Loss ^{93,94}	✓*			✓	
INTER-FRAIL Study Questionnaire ⁹⁵	✓*		✓	✓	
InterRAI Home Care Frailty Scale ⁹⁶	✓*		✓*	✓	
KLoSHA Frailty Index ⁹⁷	✓		✓	✓	
Marigliano-Cacciafesta Polypathological Scale (MPS) ⁹⁸	✓*	✓*	✓*	✓	✓
Maastricht Frailty Screening Tool for Hospitalized Patients (MFST-HP) ⁹⁹	✓*	✓*	✓	✓	
Palumbo Frailty Index ¹⁰⁰	✓		✓		
Paulson-Lichtenberg Frailty Index ¹⁰¹	✓*			✓	
Phenotype of Frailty ^{3,9,41,102,103}	✓*			✓	✓
Predictive Physical Frailty Score ¹⁰⁴	✓*		✓	✓	
Prognostic Risk Score ¹⁰⁵	✓*		✓*	✓	
Self-Reported Screening Tool for Frailty ¹⁰⁶	✓*			✓	✓
Self-Reported Questionnaire for Frailty ¹⁰⁷	✓*	✓*		✓	
Self-Report Tool of Frailty ¹⁰⁸	✓*	✓*		✓	
SHARE Frailty Instrument (SHARE FI) ¹⁰⁹⁻¹¹³	✓*			✓	
SOF Frailty Criteria ¹¹⁴⁻¹¹⁶	✓*			✓	
Strawbridge Frailty Measure ^{117,118}	✓*		✓*	✓	
Tilburg Frailty Indicator (TFI) ^{27,83-85,119-128}	✓*	✓*		✓	
WHIOS Multicomponent Measure (WHI-OS) ¹²⁹	✓*			✓	
9-Item Frailty Measure ¹³⁰	✓			✓	

onderzoek

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Table 2. Overview of healthy assessment in vascular surgery.

Author	Year	Design	Surgical type	Sample size	Frailty, no. (%)	Age	FU length ^f	Frailty assessment	Assessment tool	Mobility	Sensorium	Cognition	Function	Activity	Balance	Central muscle	Nutrition	Comorbidities	Mood
Overall																			
Partridge et al. ⁷	2014	Prospective cohort	Overall vascular surgery	114	77 (68)	76.3 ± 7.36 ^a	73 ± 31.4d ^a	Single domain	MoCA			●							
Partridge et al. ³⁴	2017	RCT	Overall vascular surgery	176	NA	75.5 ± 6.6 ^a	30d	Multi-domain	NA	○		●	○	○			○	○	○
Ambler et al. ²⁸	2015	Retrospective cohort	Overall vascular surgery	413	NA	77 (65–95) ^b	18 (12–24) m ^b	Multi-domain	AVFS		○	○	●	○	○		●	●	
Pol et al. ⁸	2011	Prospective cohort	Overall vascular surgery	142	50 (35)	68 ± 11 ^a	30d	Multi-domain	GFI	●	○	○	○	○			○	○	○
Partridge et al. ³¹	2015	Prospective cohort	Overall vascular surgery	125	60 (48)	76.3 ± 7.27 ^a	30d	Multi-domain	EFS			○	○	○			○	○	○
Karam et al. ³⁰	2013	Retrospective cohort	Overall vascular surgery	67,308	NA	68 ^c	30d	Multi-domain	mFI		○		○					○	
AAA																			
Endicott et al. ¹²	2017	Retrospective cohort	EVAR, OAR	1340	128 (10)	≥80	30d	Single domain	3-point FS				○						
Harris et al. ³⁸	2017	Retrospective cohort	EVAR	13,432	389 (3)	77 ± 8/ 73 ± 8 ^{a,d}	30d	Single domain	Dependent/independent				○						
Scarborough (1) et al. ³³	2015	Retrospective cohort	EVAR	11,687	452 (4)	64.8 ± 14.1/ 72.2 ± 13.2 ^{a,d,e}	30d	Single domain	Dependent/independent				○						
Drudi et al. ¹¹	2016	Retrospective cohort	EVAR, OAR	149	49 (33)	75.6 ± 8.8 ^a	4yr	Single domain	PMA							●			
Lee et al. ³⁶	2011	Retrospective cohort	OAR	262	NA	69.5 ± 10.5 ^a	2.3yr	Single domain	PMA							●			
Hale et al. ³⁹	2016	Retrospective cohort	EVAR	200	25 (13)	74 ± 7.5 ^a	8.4yr	Single domain	L3 skeletal muscle area							●			
Newton et al. ³⁷	2018	Retrospective cohort	EVAR	135	45 (34)	70 (65–76) ^b	5yr	Single domain	PMA							●			
Srinivasan et al. ²⁷	2016	Retrospective cohort	Ruptured AAA repair	205	NA	85 ^c	3yr	Multi-domain	RAFS				○					○	
Arya et al. ¹⁴	2015	Retrospective cohort	EVAR, OAR	23,027	4178 (23)	73.4 ± 8.6 ^a	30d	Multi-domain	mFI		○		○					○	
LEAD																			
Shiraki et al. ³⁵	2016	Retrospective cohort	Endovascular (CLI)	473	236 (50)	74 ± 10 ^a	3yr	Single domain	GNRI								●		
Scarborough (2) et al. ³³	2015	Retrospective cohort	LEB	17,929	2523 (14)	64.8 ± 14.1/ 72.2 ± 13.2 ^{a,d,e}	30d	Single domain	Dependent/independent				○						
Dinga et al. ³²	2017	Retrospective cohort	Endovascular (CLI)	1048	251 (24)	≥70	30d	Single domain	Dependent/independent				○						
Nyers et al. ¹⁰	2017	Retrospective cohort	Endovascular, LEB	188	NA	66 ^c	12 (3–24) m ^b	Single domain	PLVI							●			
Matsubara et al. ⁴⁰	2015	Retrospective cohort	Endovascular, LEB (CLI)	64	28 (44)	69.2 ± 11.8/ 73.8 ± 9.6 ^{a,g}	3.5 yr	Single domain	L3 skeletal muscle area							●			
Morisaki et al. ²⁵	2017	Retrospective cohort	Endovascular, LEB (CLI)	266	92 (35)	77.8 ± 9.5/ 72.5 ± 10.5 ^{a,g}	2 yr	Multi-domain	CLI Frailty Index	○						●	●		

Established frailty measurement tools^a

<i>Multidimensional^b</i>	
Frailty Index	Calculated by counting the number of deficits across multiple domains out of a total list of potential deficits for that person.
Groningen Frailty Indicator	Tool consisting of fifteen questions embedded within the questionnaire to assess the prevalence of frailty. This instrument is aimed at determining the level of frailty through measuring loss of function in four domains: physical (mobility functions, multiple health problems, physical fatigue, vision and hearing), cognitive (cognitive dysfunction), social (emotional isolation) and psychological (depressed mood and feelings of anxiety).
Clinical Frailty Scale	A 9-point scale that summarizes the overall level of fitness or frailty of an older adult.
<i>Not multidimensional^c</i>	
Fried Frailty Phenotype	Defines frailty as the presence of five components: weakness, slowness, exhaustion, low physical activity, and unintentional weight loss.

Other frailty measurement tools^d

<i>Multidimensional</i>	
Kihon Checklist	25-item questionnaire including seven categories: daily life, physical ability, nutrition, oral condition, the extent to which one is housebound, cognitive status, and depression risk.
OHT (Orthoptic heart transplantation)	Objective frailty tool developed for patients undergoing orthotopic heart transplantation incorporating age, BMI, comorbidities, laboratory values and functional status.
Frailty Screening Tool	
Multidimensional prognosis index	A predictive tool of mortality for hospitalised elderly patients based on a standardised Comprehensive Geriatric Assessment. It is based on information on functional, cognitive, and nutritional status, as well as medical and social factors.
Comprehensive frailty severity index	Derived from well documented surrogates of physical performance (Karnofsky performance scale), Nutrition (Modified Academy/ASPEN assessment), and severity of liver disease and inflammation (CONUT score).
Combined frailty	Composite 7-item measure, which includes modified Fried Frailty phenotype and domains of both depression and cognitive impairment
<i>Not multidimensional</i>	
Liver Frailty Index	Tool composed of 3 performance-based tests (grip strength, chair stands, and balance).
Short Physical Performance Battery	An objective assessment tool for evaluating lower extremity functioning in older persons. Consists of 3 components measured, ability stand in different positions, timed walking trials, sit to stand times.
Karnofsky Performance Status	Assessment tool for functional impairment. A 0-100 scale that summarizes the physical function of a patient
Braden Scale	Developed for early identification of patients at risk for forming pressure sores. The scale is composed of six sub-scales that reflect: sensory perception, skin moisture, activity, mobility, friction and shear, and nutritional status.
The frailty risk score	Composed of 16 biopsychosocial factors including fatigue, weakness, dyspnea, chronic pain, falls, vision impairment, urinary incontinence, and nutrition issues plus biomarkers: C-reactive protein, white blood cell count, hemoglobin, and albumin.
CES (Center for Epidemiological Studies) depression scale	A 20-item measure that asks caregivers to rate how often over the past week they experienced symptoms associated with depression, such as restless sleep, poor appetite, and feeling lonely.
Montreal Cognitive Assessment (MoCA)	A cognitive screening test consisting of 30 questions. Testing the domains of Orientation, Memory, Executive function/visuospatial ability, Language, Abstraction, Animal naming, Attention and clock-drawing test.
FRAIL scale	Five self-reported questions assessing fatigue, resistance, ambulation, illness, and loss of weight
5 item Self-reported test	5 item test of physical frailty including: Unintentional weight loss, exhaustion, physical activity, activities of daily living, and instrumental ADLs
Muscle wasting	Muscle measurements collected from CT scans. Psoas muscle size (cross-sectional area, in mm ²) and quality (density, Hounsfield units [HU]), which included both left and right psoas muscles, were measured at the L4 vertebral level.
DMI-10 (depression in the medically ill)	The DMI-10 is a 10-item questionnaire that is designed to measure depression in the medically ill and avoids the use of items such as fatigue, sleep, appetite disturbance and weight change that are common to both depression and many illnesses.
Frailty index for people living with HIV [137]	A frailty index designed for patients with HIV. Contains 30 relatively nonspecific health variables including comorbidities, BMI, biochemistry, HIV viral load, CD4+ count.
Functional metrics	
Grip Strength	A simple measurement of grip strength.
Gait Speed	A simple measure of gait speed.
30-Second Chair Sit-Stand	A count of how many stands from a chair a person can complete in 30 s.
Timed Up and Go	The time it takes to stand from a sitting position, walk three metres, turn around and sit back down.

^a Frailty tools are considered 'established' if they were tools specifically developed and validated as a measure of frailty in a general population

^b Frailty measurement tools that assess deficits across multiple domains including cognition, function, sensorium, nutrition and co-morbidity

^c Frailty measurement tools that assess deficits in single domains

^d Frailty tools that did not meet the 'established' criteria above are listed as 'other frailty measurement tools'



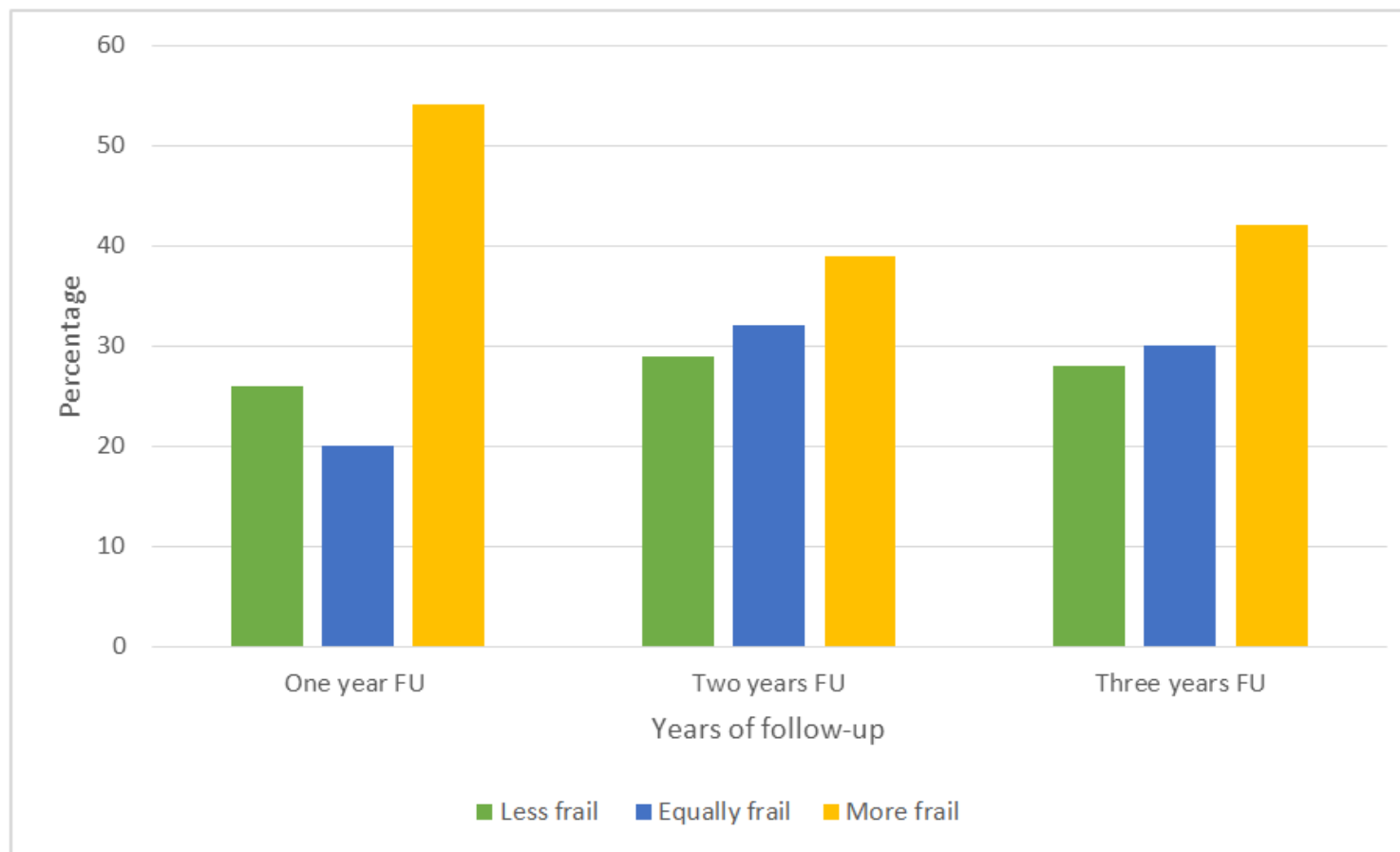


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Figure 1: Change in frailty during follow-up



Langenbeck's Archives of Surgery (2020) 405:843–850
<https://doi.org/10.1007/s00423-020-01956-6>

ORIGINAL ARTICLE



Transitions in frailty state after kidney transplantation

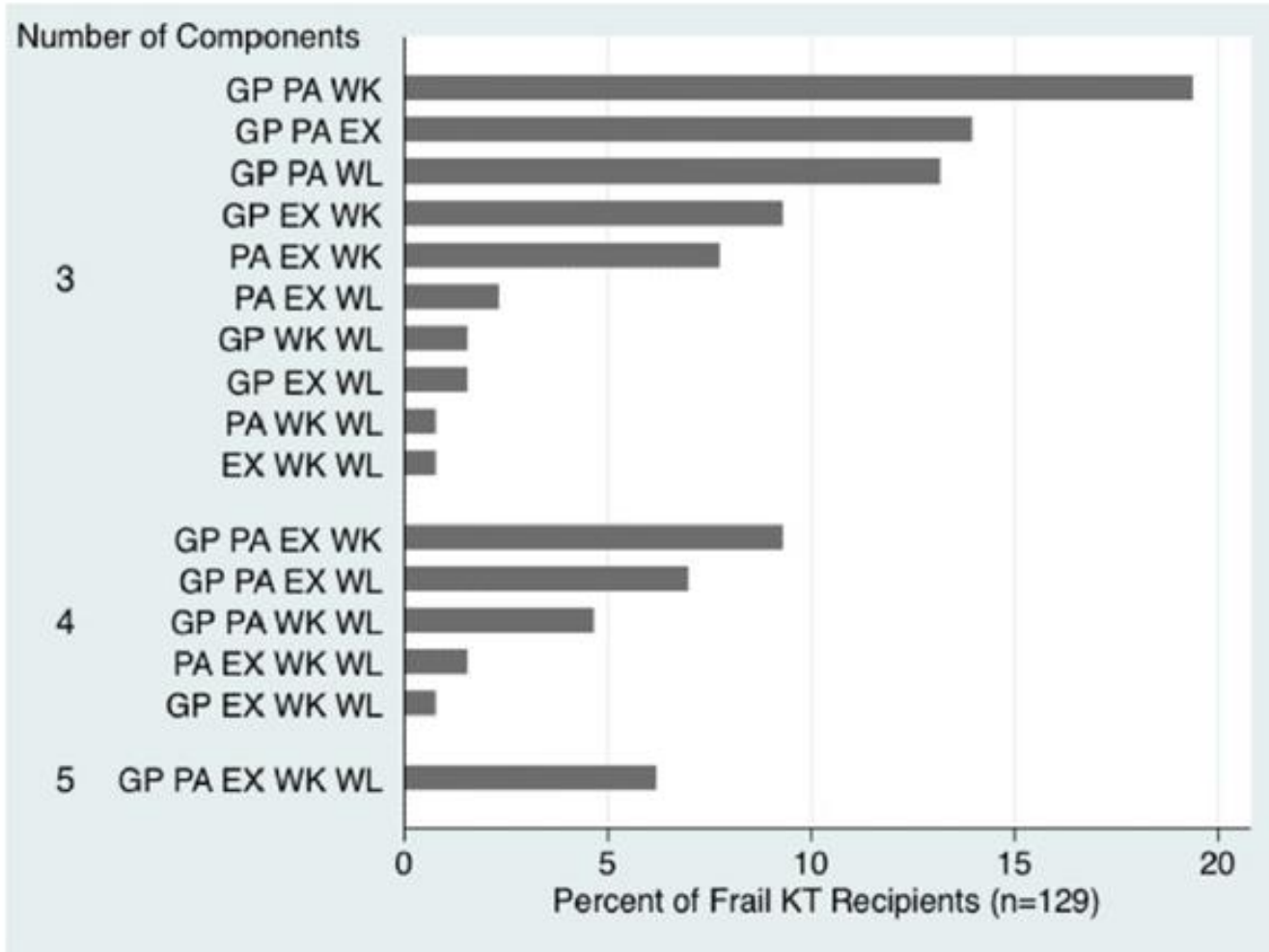
Evellen E. Quint¹ · Lasse Schoppmeyer¹ · Louise B.D. Banning¹ · Cyril Moers¹ · Mostafa El Moumeni¹ · Gertrude J. Nieuwenhuijs-Mook¹ · Stefan P. Berger¹ · Stephan J.L. Bakker¹ · Robert A. Pol¹

Received: 2 April 2020 / Accepted: 10 July 2020 / Published online: 20 July 2020
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Figure 2: Patients with a deterioration in frailty during follow-up, per domain





GP=verminderde knijpkracht; PA=lage fysieke activiteit; EX=vermoeidheid; WK=loop snelheid; WL=gewichtsverlies

- **13.4** point CCI increase (95% CI: 5.5-21.3)
- Unadjusted $p=0.0001$
- Adjusted for confounders **$p=0.001$** :
 1. Age
 2. Sex
 3. ASA
 4. Charlson Comorbidity Index
 5. Hypertension
 6. BMI
 7. Smoking
 8. Dialysis
 9. Duration dialysis
 10. Transplantation type
 11. Retransplantation

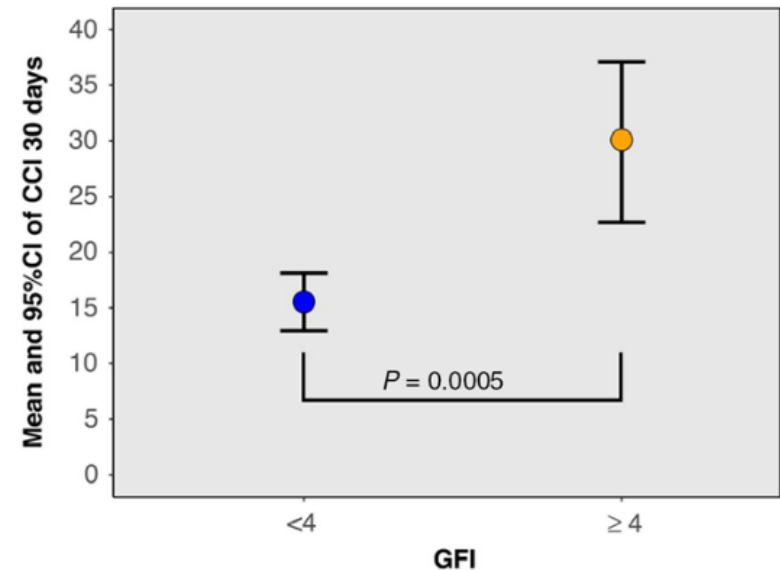


Figure 2 Relation between frailty and CCI. Relation between Groningen Frailty Indicator Score (GFI; ≥ 4 considered as frail) and Comprehensive Complication Score (CCI) within 30-day postsurgery.

Transplant International

ORIGINAL ARTICLE

Frailty has a significant influence on postoperative complications after kidney transplantation—a prospective study on short-term outcomes

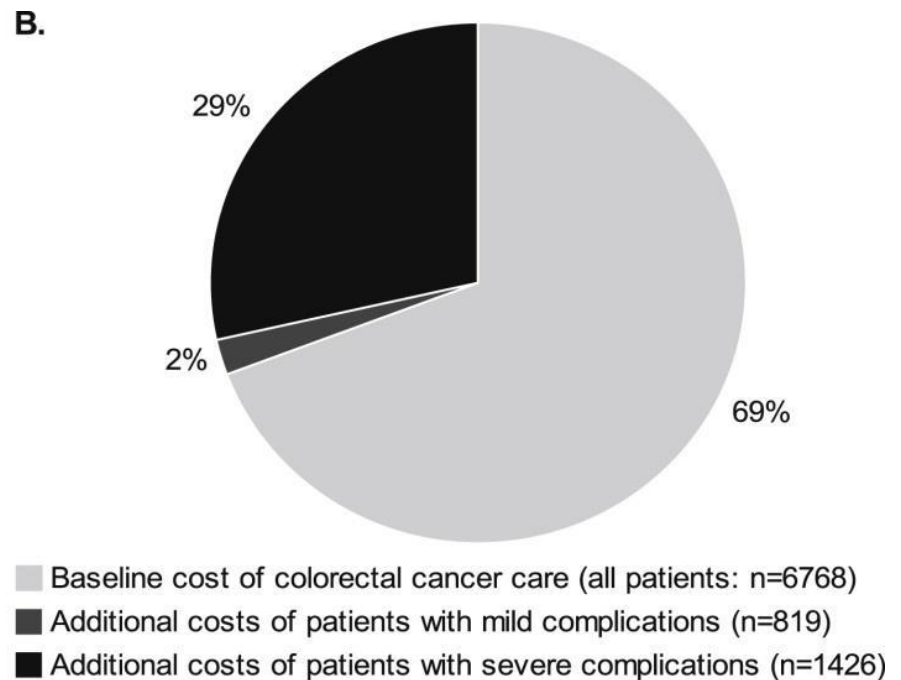
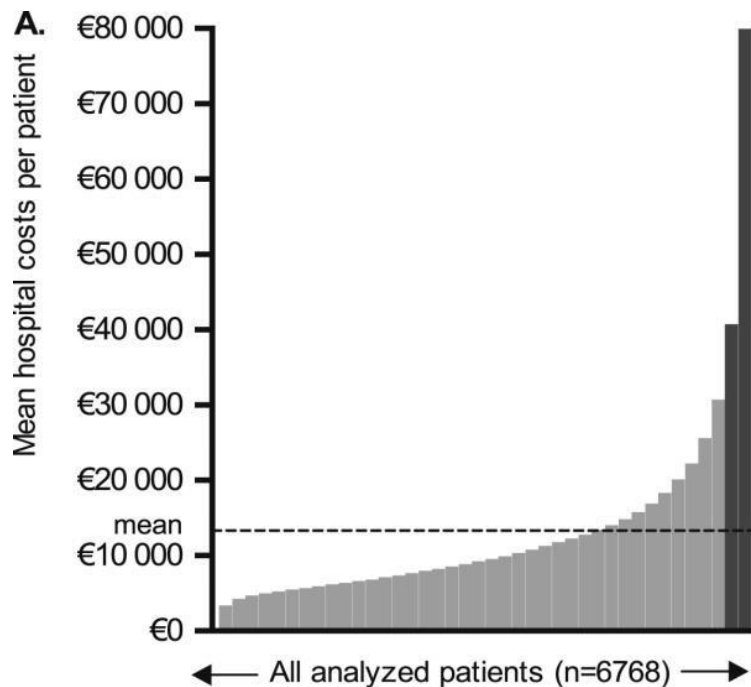
Lasse Schopmeyer¹, Mostafa El Moumni¹, Gertrude J. Nieuwenhuijs-Moeke³, Stefan P. Berger², Stephan J. L. Bakker² & Robert A. Pol¹

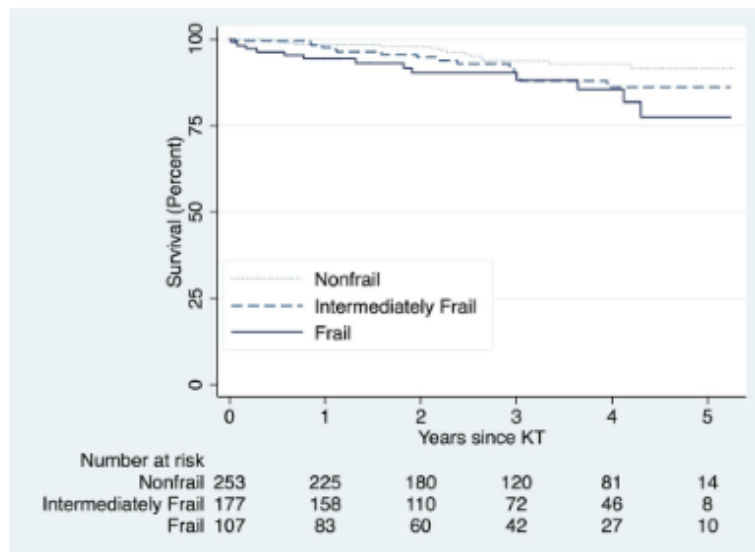


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30% van de gecompliceerde opnames is verantwoordelijk voor **90%** van de ziekenhuis kosten!





Adj HR 2.2 !



Figure 2: Survival, by frailty status at the time of transplantation (n=537). Log-rank test p-value=0.0396. Nonfrail was defined as a score of 0 or 1, intermediately frail was defined as a score of 2 and frail was defined as a score of 3 or higher.

Table 3: Risk of mortality in kidney transplantation (KT) recipients, by frailty status at the time of transplantation (n = 537)

	Hazard ratio (95% confidence interval) for mortality		
	Unadjusted	Adjusted (hybrid)	Adjusted (traditional)
Intermediately frail	1.70 (0.82–3.52)	1.49 (0.73–3.06)	1.44 (0.69–3.02)
p-Value	0.153	0.276	0.332
Frail	2.58 (1.21–5.49)	2.17 (1.01–4.65)	2.22 (1.03–4.81)
p-Value	0.014	0.047	0.042

Nonfrail was defined as a score of 0 or 1, intermediately frail was defined as a score of 2 and frail was defined as a score of 3 or higher. The adjusted model was adjusted for recipient age, sex, race, diabetes, time on dialysis and preemptive KT, as well as donor type (deceased standard criteria donor, deceased expanded criteria, donation after cardiac death donor vs. live) and cold ischemia time. In the hybrid approach, we constrained the coefficients for all the adjustment factors to be the coefficients as estimated from the Scientific Registry of Transplant Recipients. In the traditional approach, a forced model was fit to only our single-center data.



Transplant centers that assess frailty as part of clinical practice have better outcomes

Xiaomeng Chen¹, Yi Liu¹, Valerie Thompson¹, Nadia M. Chu^{1,2}, Elizabeth A. King¹, Jeremy D. Walston³, Jon A. Kobashigawa⁴, Darshana M. Dadhania⁵, Dorry L. Segev^{1,2} and Mara A. McAdams-DeMarco^{1,2*}

Table 2 Frailty assessment at kidney transplant evaluation and center-specific waitlist mortality and transplantation rates ($N = 132$)

	Crude model	Demographic + health factor model	Demographic + health + social factor model
	cIRR (95% CI)	aIRR (95% CI)	aIRR (95% CI)
Waitlist mortality rate			
Never	reference	reference	reference
Sometimes	0.84 (0.78, 0.90)	0.89 (0.82, 0.95)	0.89 (0.83, 0.96)
Always	0.86 (0.79, 0.93)	0.90 (0.83, 0.98)	0.91 (0.84, 0.99)
Transplantation rate			
Never	reference	reference	reference
Sometimes	0.89 (0.87, 0.92)	0.87 (0.85, 0.90)	0.88 (0.85, 0.90)
Always	1.07 (1.04, 1.10)	0.94 (0.91, 0.97)	0.94 (0.91, 0.97)

Crude and adjusted incidence rate ratios (cIRR and aIRR) with 95% confidence intervals (CI) are presented from Poisson regression models. Demographic + health factor models adjusted for center-mean demographic (% older, % female, % Black, % Hispanic) and health factors (% with diabetes, % undergoing dialysis); demographic + health + social factor models additionally adjusted for center-mean social factors (% low education, % working for income). Associations that are statistically significant at $p < 0.05$ are bolded

Table 3 Type of frailty assessment tool at kidney transplant evaluation and center-specific waitlist mortality and transplantation rates ($n = 132$)

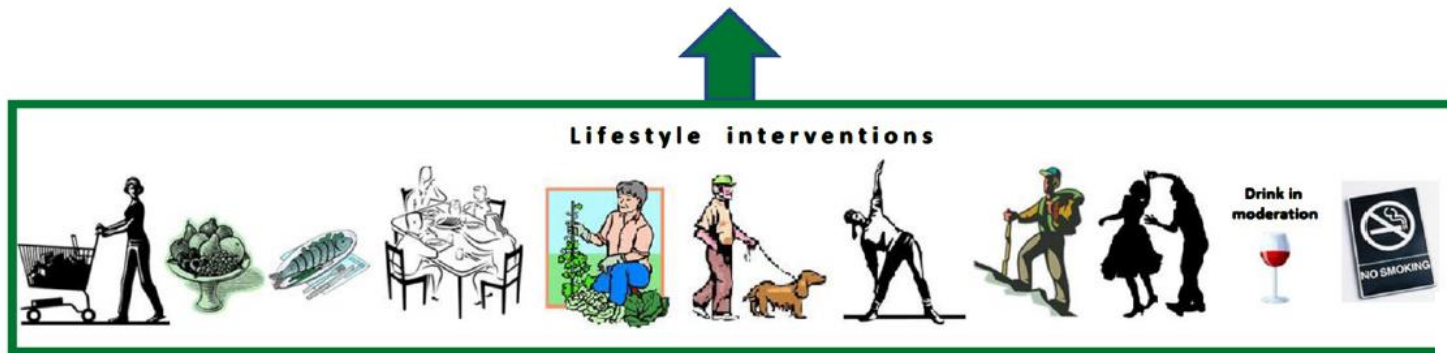
	Crude model	Demographic + health factor model	Demographic + health + social factor model
	cIRR (95% CI)	aIRR (95% CI)	aIRR (95% CI)
Waitlist mortality rate			
None	reference	reference	reference
Validated tool	0.82 (0.77, 0.88)	0.87 (0.82, 0.94)	0.89 (0.83, 0.96)
Any other tool	0.89 (0.82, 0.97)	0.93 (0.85, 1.01)	0.92 (0.84, 1.00)
Transplantation rate			
None	reference	reference	reference
Validated tool	0.96 (0.93, 0.98)	0.90 (0.88, 0.93)	0.90 (0.88, 0.92)
Any other tool	0.95 (0.92, 0.98)	0.89 (0.86, 0.92)	0.90 (0.87, 0.93)

Crude and adjusted incidence rate ratios (cIRR and aIRR) with 95% confidence intervals (CI) are presented from Poisson regression models. Demographic + health factor models adjusted for center-mean demographic (% older, % female, % Black, % Hispanic) and health factors (% with diabetes, % undergoing dialysis); demographic + health + social factor models additionally adjusted for center-mean social factors (% low education, % working for income). Associations that are statistically significant at $p < 0.05$ are bolded



Maar nu we weten wat het probleem is.....wat doen we nu?

- Meer bewegen?
- Goede of betere voeding?
- Bevorderen en/of behouden fysieke en geestelijke fitheid

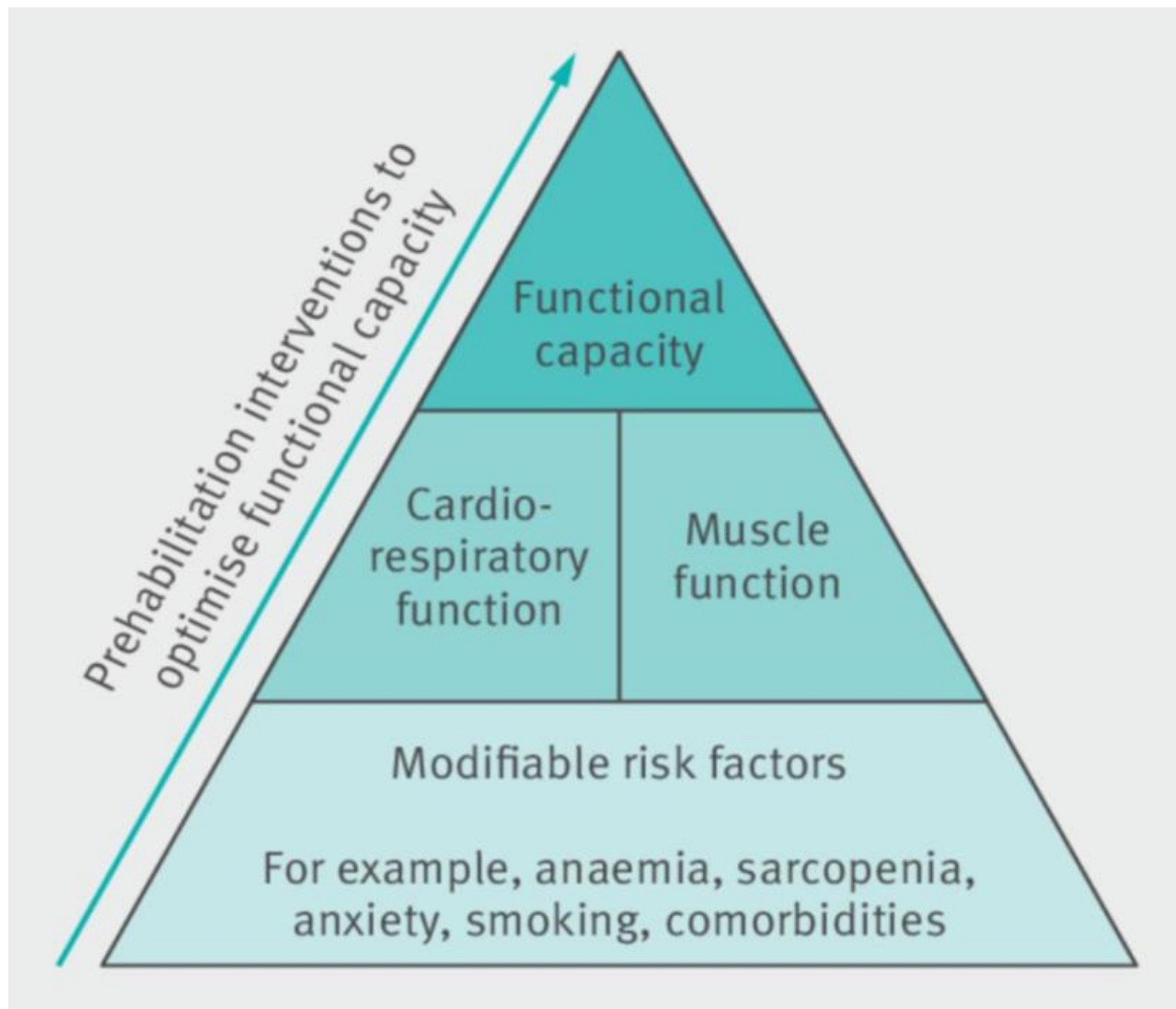


- Prehabilitatie!



Prehabilitatie: Patiënten voorbereiden op een grote operatie is net zoiets als een marathon lopen - en voor beide moet je trainen!





Chirurgische stress

- Toename in zuurstof verbruik
- Na 36 uur vasten ('nuchter zijn') word alle energie voorzien door de lever (Gluconeogenesis)
- Er ontstaat een relatieve insuline-resistentie
- Glucose aanmaak verder onder druk
- Complicaties verhogen de druk en behoefte

- Een verbeterde fysieke activiteit leid tot betere uitkomsten:
 - Verhoogde capaciteit voor zuurstof afgifte.
 - Minder insuline-resistentie.
 - Mogelijk een meer efficiënte gluconeogenese.
- Verhoging van de anaerobe drempel:
 - Lagere mortaliteit.
 - Minder complicaties.
 - Minder IC opnames.
 - Kortere opnameduur

Intradialytic Cognitive and Exercise Training May Preserve Cognitive Function



Mara A. McAdams-DeMarco^{1,2}, Jonathan Konel¹, Fatima Warsame¹, Hao Ying², Marlís González Fernández³, Michelle C. Carlson⁴, Derek M. Fine⁵, Lawrence J. Appel^{2,5} and Dorry L. Segev^{1,2}

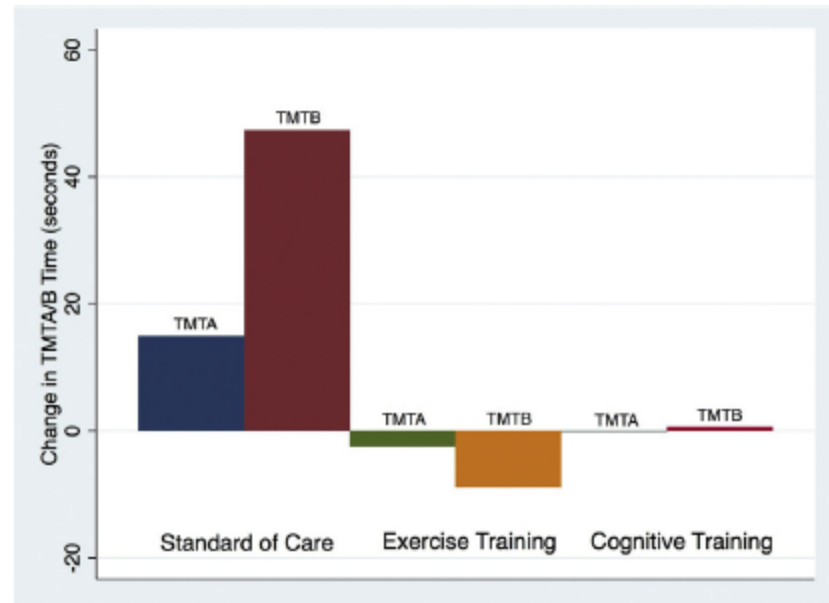
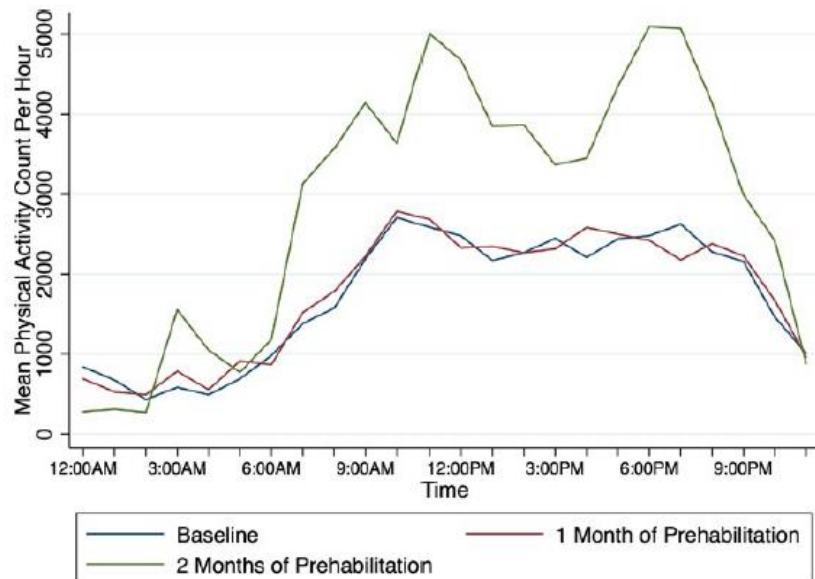


Figure 2. Mean change in psychomotor speed (Trail Making Tests A and B [TMTA and TMTB]) at 3 months for those with cognitive training, exercise training, and standard of care.





← 65%

NTX patiënten hadden een kortere opnameduur
(5 vs 10 dagen)
(RR = 0.69; 95% CI: 0.50-0.94; $P = 0.02$).

ORIGINAL ARTICLE

WILEY **Clinical TRANSPLANTATION**
The Journal of Clinical and Transplantation Research

Prehabilitation prior to kidney transplantation: Results from a pilot study

Mara A. McAdams-DeMarco^{1,2} | Hao Ying¹ | Sarah Van Pilsum Rasmussen¹ |
Jennifer Schrack² | Christine E. Haugen¹ | Nadia M. Chu² |
Marlís González Fernández³ | Niraj Desai¹ | Jeremy D. Walston⁴ | Dorry L. Segev^{1,2}



University Medical Center Groningen

UMC Groningen Transplant Center
Shared care for shared organs®

Resultaten: epidemiologische factoren

- 43% verminderde handknijpkracht
- 42% beperking 500m lopen
- 46% verminderd uithoudingsvermogen
- 15% voldoet aan Fitnorm
- Geen problemen balans

Lichamelijke fitheid



- 35% verhoogd risico op ondervoeding
- 5% ondergewicht
- 44% overgewicht
- 54% vetpercentage boven norm (man 25%, vrouw 31%)
- 36% verhoogd LDL cholesterol

Voedingstoestand



- 55% vermoeidheid
- 33% angstklachten
- 10% klinische depressieve klachten
- 35% subklinische depressieve klachten

Mentale veerkracht



Resultaten: belemmerende en bevorderende factoren

Vermoeidheid
Lichamelijke klachten
Lage verwachtingen
Gebrek motivatie/zelfdiscipline
Onvoldoende kennis wat kan
Weinig aandacht voor bewegen vanuit HV

Sociale steun naasten
'Stok achter de deur'

Lichamelijke fitheid



Verleidingen niet kunnen weerstaan
Al een dieet hebben
Weinig inzicht in eigen voedingstoestand
Onvoldoende kennis o.a. relatie voeding en algehele conditie

Belang van gezonde voeding
Sociale steun naasten

Voedingstoestand



Drempel om psychosociale hulp te accepteren
Weinig aandacht emotionele gevolgen wachtlijst vanuit HV
Onvoldoende kennis en vaardigheden coping

Sociale steun naasten
Lotgenotencontact
Bewegen

Mentale veerkracht



Resultaten: interventie

- 79% behoefte aan prehabilitatie
 - 73% verbeteren kracht en conditie
 - 48% behalen gezonde voedingstoestand
 - 30% leren omgaan met stress/vermoeidheid

Wel behoefte	Geen behoefte
Fit worden voor transplantatie	Geen motivatie
Deel blijven nemen aan maatschappij	Doe al wat ik kan
Begeleiding nodig	
Kennis nodig wat kan/mag	

Resultaten: opzet prehabilitatie

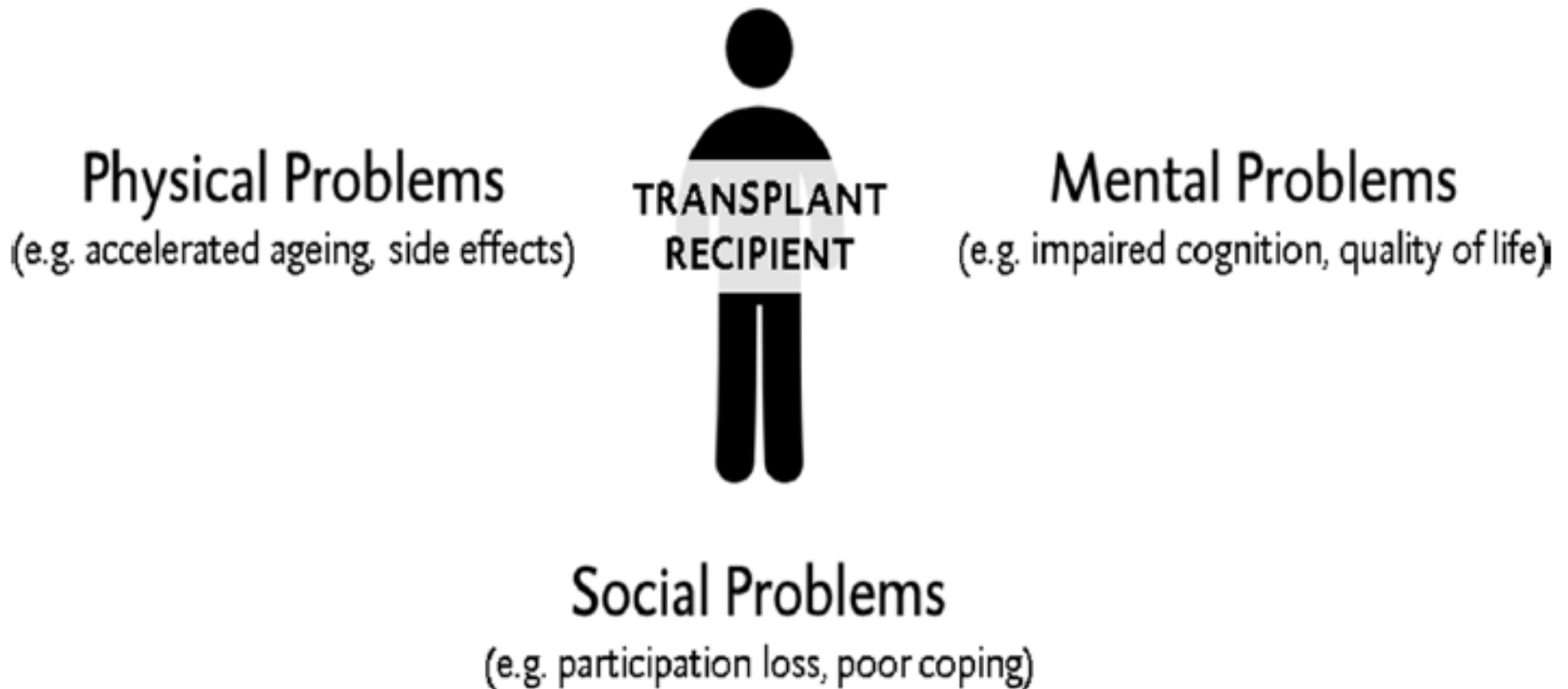
- Individueel programma
 - 35% combinatie individueel/groepsprogramma
- Op maat gemaakt voor eigen situatie
- Met begeleiding
- Uitvoeren in eigen (woon)omgeving
- Niet op dialyse dagen
- *Afstemming met reguliere zorgverleners*

Take home message(s)



Patient and Graft survival

(e.g. poor long-term outcomes)



Voordat je gaat ingrijpen/behandelen..

- Bepaal welke domeinen in iedere individuele patiënt de belangrijkste bijdrage leveren aan de mate van frailty!
- Verbeter cognitie, fysieke conditie, voeding en/of psychosociaal functioneren

- Maakt niet uit welke je kiest!
- Multidomain heeft de voorkeur boven single
- Frailty verandert na transplantatie dus bepaalt af en toe de verandering in domeinen.
- Maak afspraken met je afdeling ouderengeneeskunde over verwijzing voor comprehensive geriatric assessment.

Bedankt voor jullie aandacht



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