



Is it still ethical to provide every ESKD patient with thrice-weekly 4-hour hemodialysis sessions ?

Pr P.Saudan
Unité de dialyse, Service de Néphrologie
HUG, Genève

The 3 weekly 4 h paradigm in HD: why ?

Knowledge and Practice of Incremental Hemodialysis: A Survey of Canadian Nephrologists

Response rate 35% (243/691).
Most (138/211, 65%) of the participants prescribed incremental HD (< 3/wk) using an individualized approach at the nephrologist's discretion.

98% did not report any policy for implementation.

Most important factor for eligibility: -

- Residual urine output (65%)
- electrolyte stability (44%)
- patient goals of care (40%).

Dahiya et al. Can J Kidn. Health Dis 2021

HD patients with <3 weekly dialysis sessions
< 4% US, Europe

9% Japon

43% Iran

75% Soudan

10-20% Chine

70% Inde

Rhee Sem Dial 2013

Swiss dialysis registry 2023

	N	%
> 3x	39	0.9
3x	4152	92.7
< 3x	286	6.4
Total	4477	100.0

By courtesy of Rebecca Ghidotti

The **3** weekly 4 h paradigm in HD: why ?

You: why do we perform hemodialysis thrice weekly instead of other frequencies ?

Waste Product Removal and fluid balance: Three sessions per week are generally sufficient to keep these at safe levels for most patients.

Patient Tolerance: More frequent dialysis sessions (e.g., daily) can be physically and emotionally taxing for patients. could significantly impact a patient's lifestyle and well-being.

Practical Considerations: From a logistical and financial viewpoint, three times a week is also a feasible schedule for most dialysis centers and patients. Increasing the frequency would put additional demands on dialysis facilities and healthcare resources.

Clinical Evidence: Research and clinical experience have shown that three times per week is an effective balance for the majority of patients requiring hemodialysis. It is based on careful studies that took into account the removal of toxins, fluid management, patient outcomes, and quality of life.

You: are you aware of clinical trials whose conclusions support thrice weekly hemodialysis is the standard of care ?

National Cooperative Dialysis Study (NCDS), Hemo Study, KDOQI and ERBP clinical guidelines

Chat GPT 4

3 weekly 4 h paradigm in HD

Longer treatment time and slower ultrafiltration in hemodialysis: Associations with reduced mortality in the DOPPS

R Saran¹, JL Bragg-Gresham², NW Levin³, ZJ Twardowski⁴, V Wizemann⁵, A Saito⁶, N Kimata⁷, BW Gillespie⁸, C Combe⁹, J Bommer¹⁰, T Akiba⁷, DL Mapes², EW Young¹¹ and FK Port²
Kidney Int 2006

DPPS, 7 countries, 22000 HD patients

Shorter length dialysis sessions are associated with increased mortality, independent of body weight

Jennifer E. Flythe^{1,2}, Gary C. Curhan^{1,2,3} and Steven M. Brunelli^{1,2,4} *Kidney Int 2013*

10571 HD patients
 2382 pts with/2382 without >240 mn session
 Median FU 24.4 mo

Initial Session Duration and Mortality Among Incident Hemodialysis Patients

Swaminathan et al. AJKD 2017

87000 HD patients (2006-10 FU to Dec 2012)
 Session duration \geq 4 vs 3 hr
 Primary outcome : 1- and 2-yr mortality

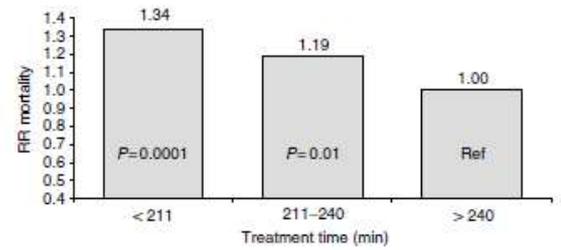
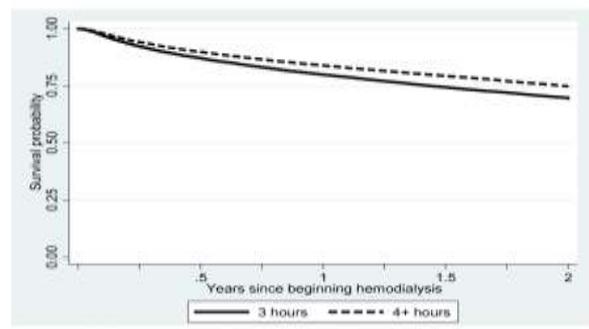


Figure 2 | RR of all-cause mortality, by TT category.
 The incremental RR of mortality with decreasing TT categories in all DOPPS regions combined. The referent category is TT >4 h (240 min).

Session lengths < 240 min significantly associated with increased all-cause mortality (adjusted HR1.26).

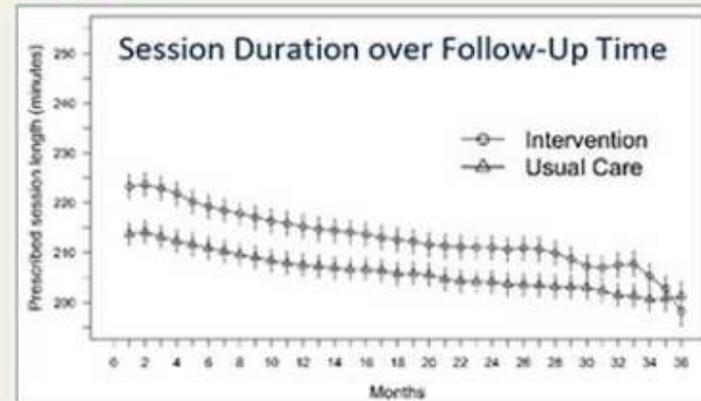


HR 0.77 (95% CI 0.70-0.84)

The TiME Trial: A Fully Embedded, Cluster-Randomized, Pragmatic Trial of Hemodialysis Session Duration

RESULTS

- >7000 participants enrolled ahead of schedule
- Opt-out rate was <1%
- Participant characteristics closely matched the US dialysis population
- Uptake of the intervention was not sufficient to determine impact of longer sessions on outcomes



Primary Analysis Population	Intervention	Usual Care
Deaths per 100 patient-yr	19.2 (17.4, 21.0)	19.7 (18.1, 21.4)
HR (95% CI); p Value	0.97 (0.84, 1.12); 0.69	
Hospitalizations per 100 pt-yr	204.5 (186.9, 223.7)	214.1 (202.5, 226.3)
Rate ratio (95% CI); p Value	0.96 (0.86, 1.06); 0.40	

What the guidelines tell us

1. Time and frequency

Guideline 1.1

Dialysis should be delivered at least 3 times per week and the total duration should be at least 12h per week, unless supported by significant renal function. See also Guideline 4.1. (Evidence level III)

Guideline 1.2

An increase in treatment time and/or frequency should be considered in patients with haemodynamic or cardiovascular instability. (Evidence level II)

Guideline 1.3

Dialysis treatment time and/or frequency should be increased in patients who remain hypertensive despite maximum possible fluid removal. (Evidence level III)

Guideline 1.4

An increase of treatment time and/or frequency should be considered in patients with impaired phosphate control. (Evidence level III)

Guideline 1.5

An increase of dialysis time and/or frequency should be considered in malnourished patients. (Opinion)



EBPG guidelines NDT 2007

1. Dialysis dose in thrice weekly dialysis schedules

We recommend eKt/V as the most clinically valid small-solute measure of dialysis dose, and recommend monitoring of dialysis dose on a monthly basis for the majority of centre-based dialysis patients. [1B]

We recommend targeting dialysis dose to achieve consistently a minimum eKt/V of 1.2 for thrice weekly patients, in the absence of a measured contribution from residual function. [1B]

We recommend a minimum of 12 hours per week for the majority of thrice weekly patients with minimal residual function. [1B]

UK guidelines BMC Nephrol.2019

Why is RKF so important in dialysis patients ?

SURVIVAL !

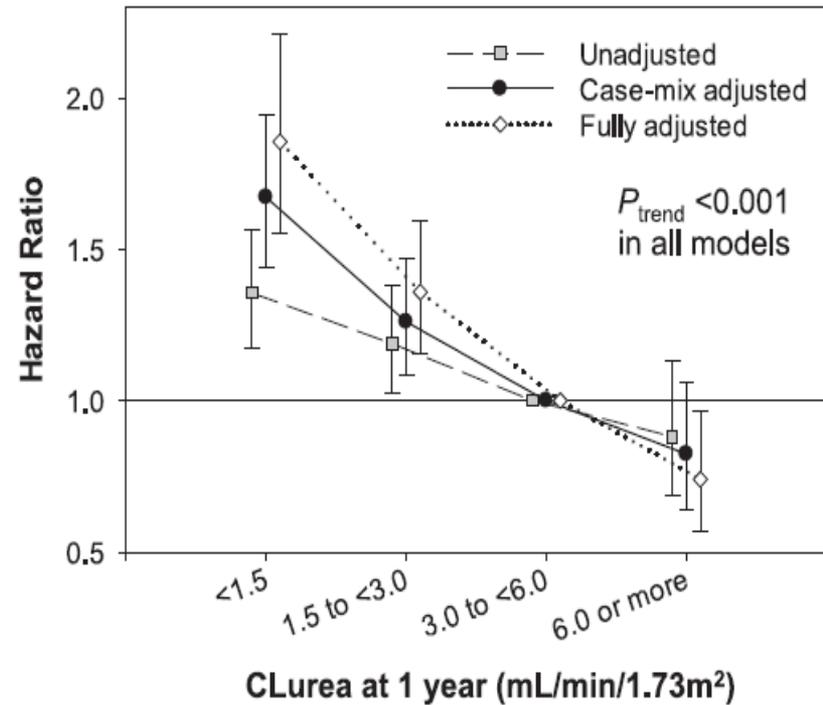
PD studies (CANUSA, ADEMEX, NECOSAD) even a small amount of RKF positive effect on survival and quality of life

Bargman et al. Kidney Int 1996; Paniagua et al. NEJM 2002; Termoshuizen et al. Kidney Int 2007

US cohort 2007-2010

6538 patients with baseline RKF

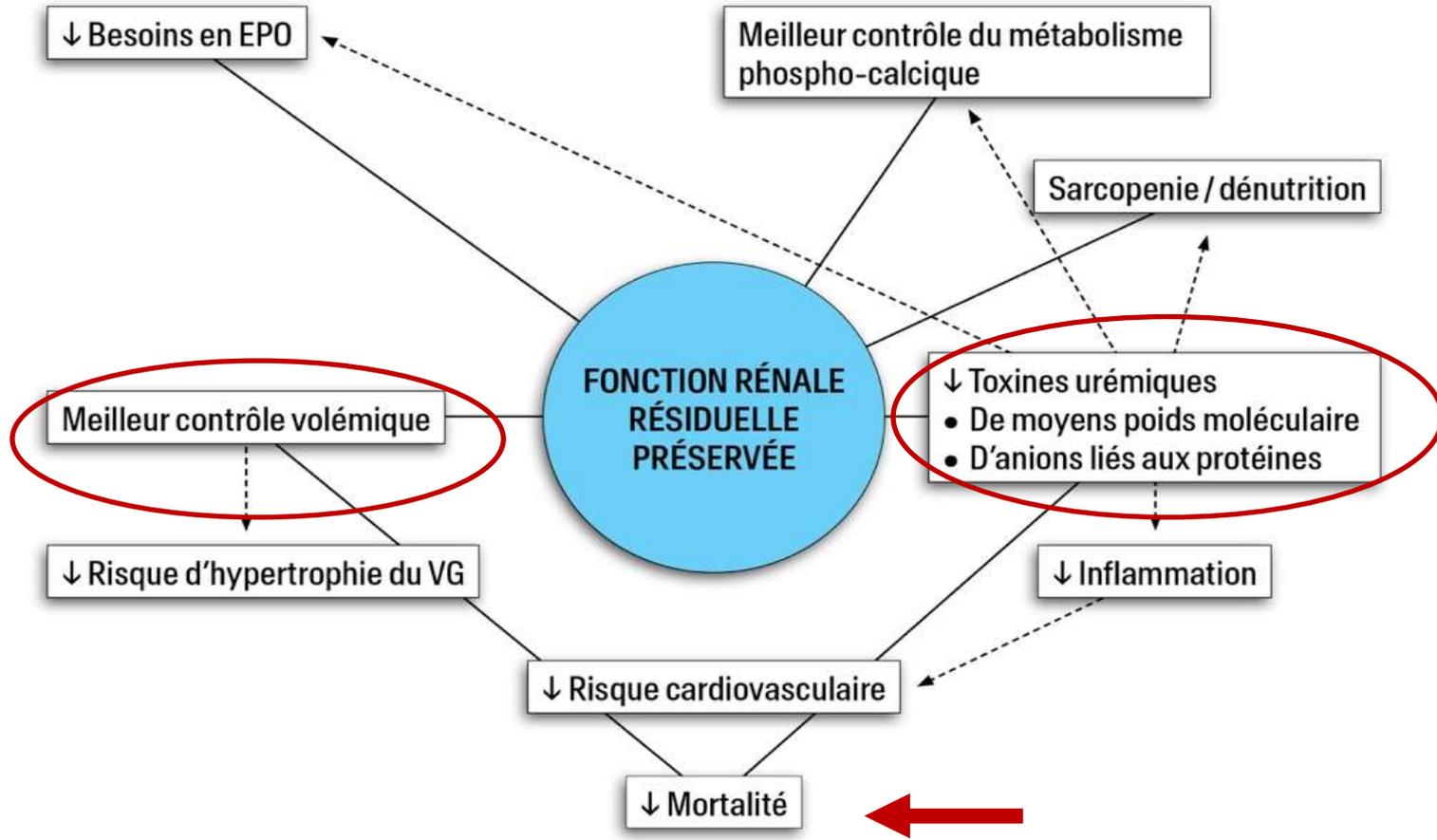
One-year survival



Obi et al. JASN 2016

Importance de la fonction rénale résiduelle

Bénéfices de la préservation de la fonction rénale résiduelle :



Decline of RKF in incident dialysis patients

522 patients (PD and HD patients)
NECOSAD study group

Jansen et al. Kidney Int 2002

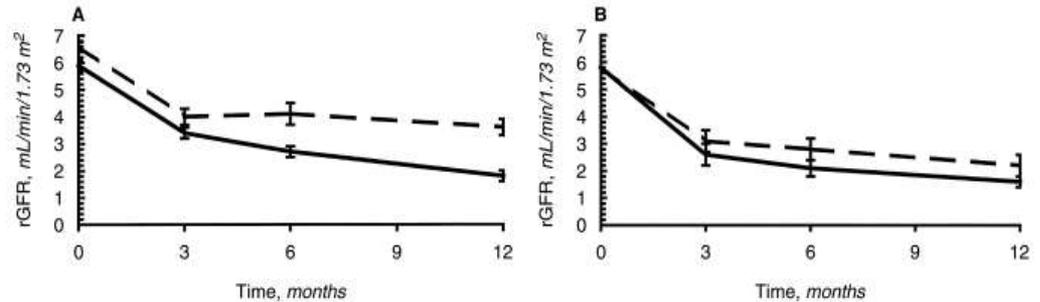
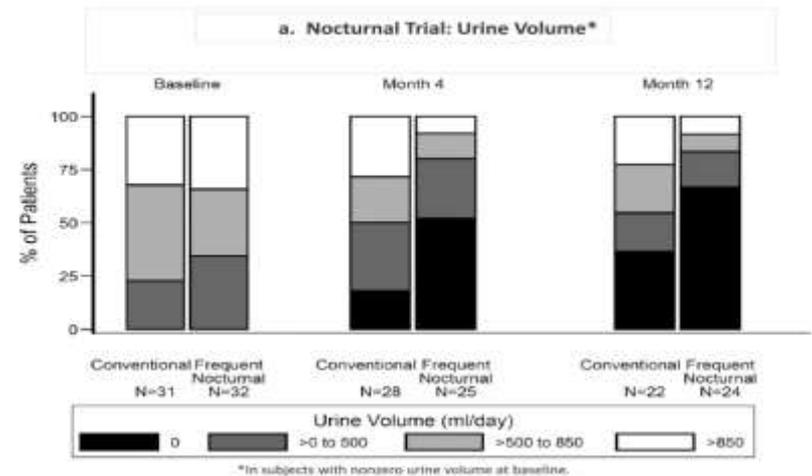


Fig. 1. Unadjusted (A) and adjusted (B) residual glomerular filtration rate (rGFR) values \pm SE at the start of dialysis treatment, and at 3, 6 and 12 months after the start of dialysis treatment. The adjusted values were obtained after back transformation from $\ln(rGFR+1)$, which was the studied variable. Symbols are: (dashed lines) values in the PD patients; (solid lines) rGFR values in the HD patients. Adjustments were made for baseline GFR, age, primary kidney disease, comorbidity, body mass index, systolic and diastolic blood pressure, use of antihypertensive drugs, dropout, time of dropout, and reason of dropout (including change of treatment). Unadjusted rGFR values were significantly higher in PD patients at all time points. After adjustment, averaged over time, PD patients had a higher rGFR than HD patients ($P < 0.0001$). The relative decline of rGFR was faster in HD compared to PD patients ($P = 0.04$).

Frequent nocturnal hemodialysis accelerates the decline of residual kidney function

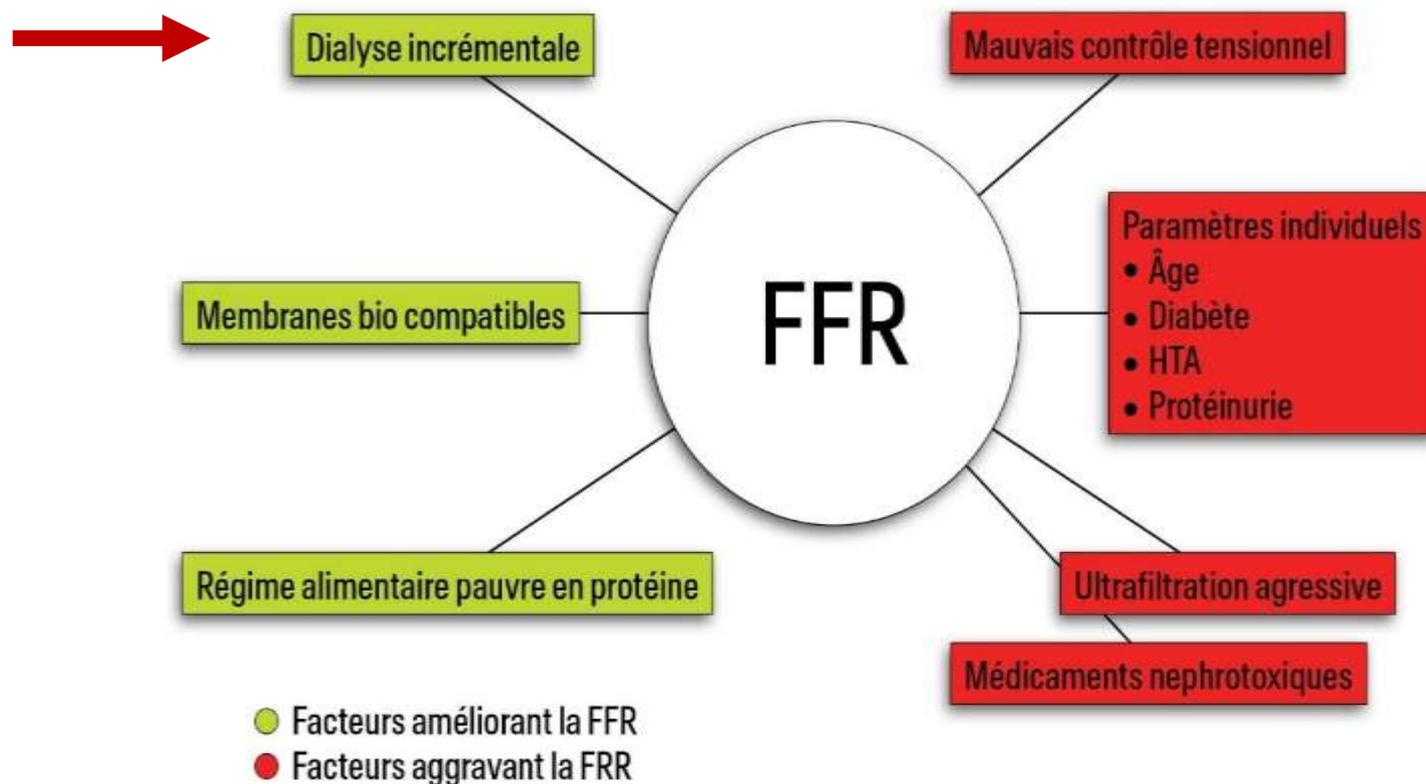
Daugirdas et al. Kidney Int 2013



*In subjects with nonzero urine volume at baseline.

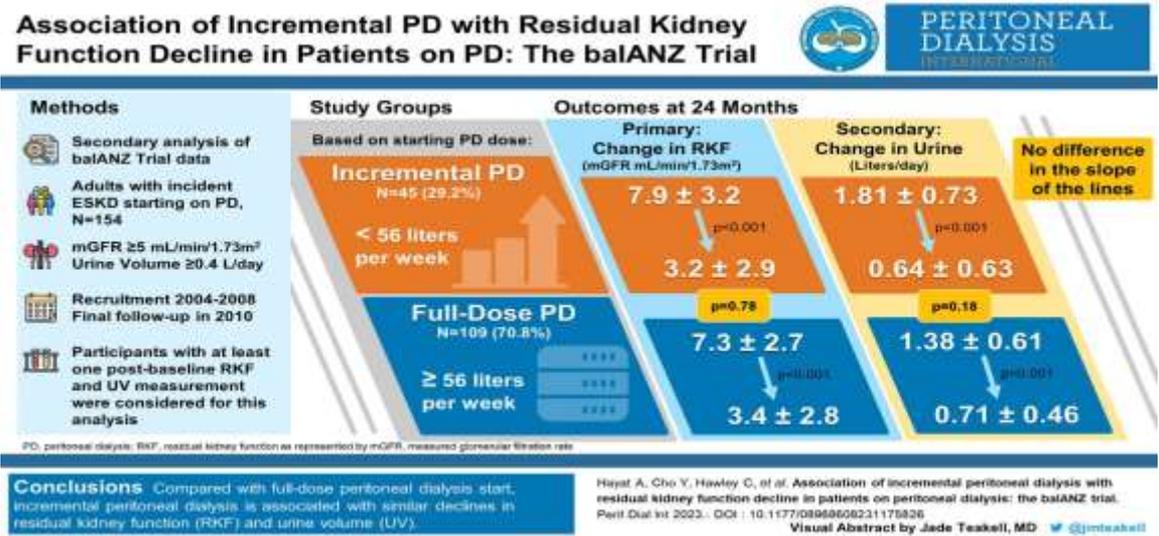
Importance de la fonction rénale résiduelle

Facteurs déterminants pour la préservation de la fonction rénale résiduelle :



Incremental dialysis in incident patients : does it preserve RKF ? *PD patients*

Incremental PD defers by one year time to full dialysis
Garofalo et al. J Nephrol 2019

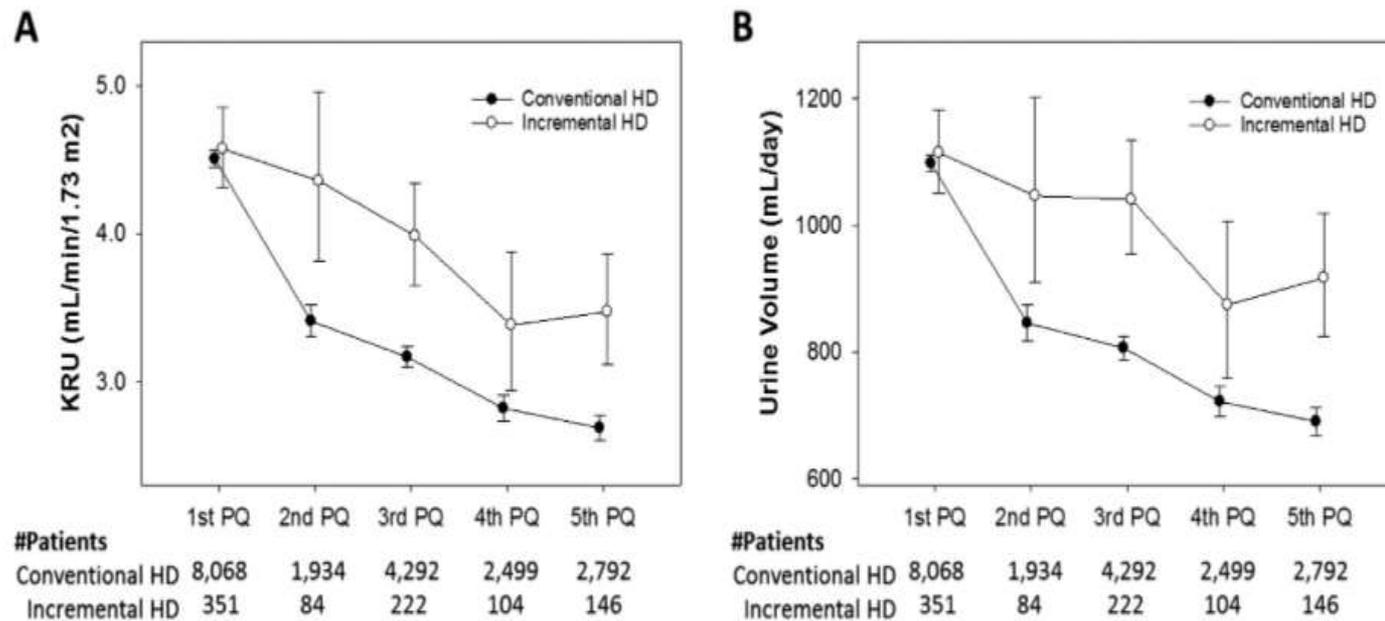


Hayat et al. PDI 2023

Incremental dialysis in incident patients : does it preserve RKF ? *HD patients*

Incremental Hemodialysis, Residual Kidney Function, and Mortality Risk in Incident Dialysis Patients: A Cohort Study

Longitudinal cohort 23645 incident HD patients of whom 351 in incremental HD



Incremental hemodialysis: a new paradigm

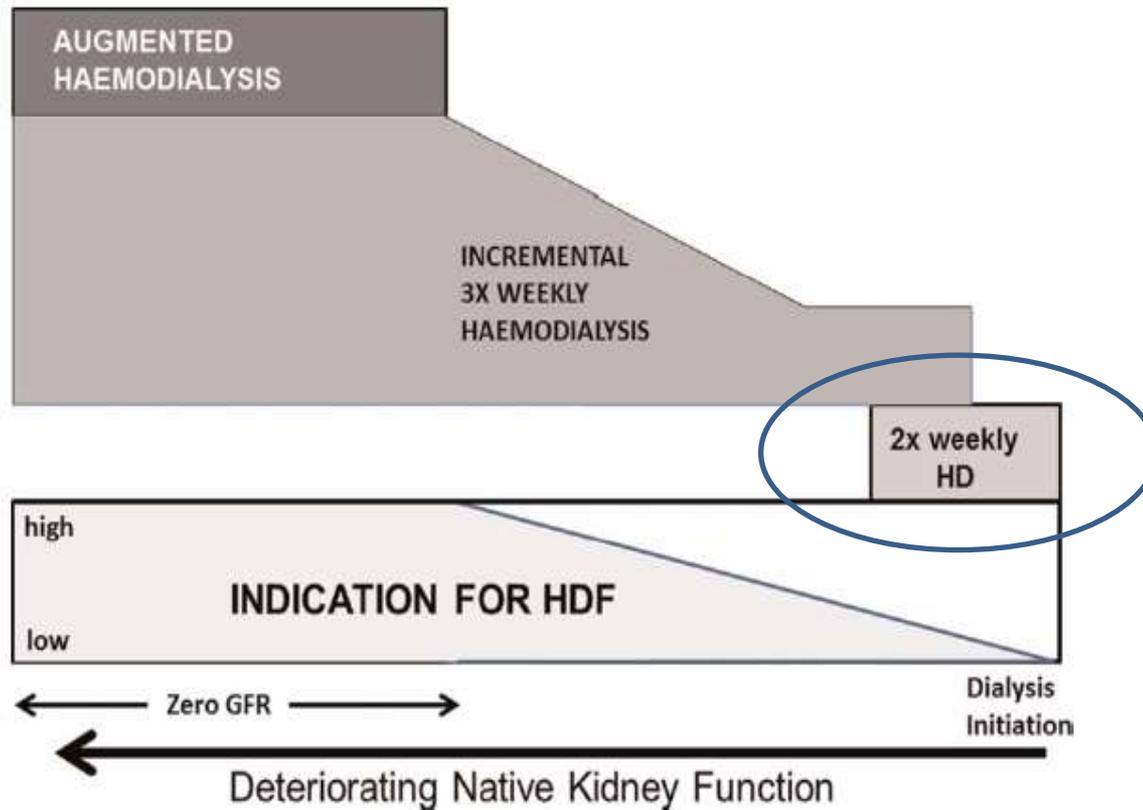


FIGURE 2: Schematic cartoon depicting the application of incremental haemodialysis as patients progressively lose residual kidney function.

Why incremental dialysis ? pros

- RKF (or urine volume) associated with increased survival
- Frequent HD associated with more rapid loss of RKF
- PD associated with increased preservation of RKF
- Increased preservation of RKF with HD session 2x/wk
- Increased mortality within first 6 months HD
- Improved quality of life (?)
- **The climate impact of dialysis**

Rhee Sem Dial 2013; Daugirdas et al. KI 2009; Zhang et al. Am J Nephrol 2014

Incremental dialysis ? cons

- Cons:
- Malnutrition risk
- Underdialysis risk
- «Patient's reluctance to increase dialysis (session duration or frequency)»

Potential risks when implementing incremental HD

- Not indicated in patients with big interdialytic weight intake
- Not indicated in «hypercatabolic «patients
- Long interdialytic interval associated with increases of mortality and hospitalisation

Foley et al. NEJM 2011

Guidelines and incremental HD

Twice weekly dialysis. There is no published evidence supporting the safety of twice weekly dialysis. Some centres in Europe treat patients with residual renal function by twice weekly dialysis as part of an incremental or early start programme [7]. The maximum SRI practically achievable with twice weekly dialysis without renal function is <2 . Therefore, the recommended minimum SRI of 2 would only be possible with demonstrated significant residual renal function.

- 3.1 We recommend a target single pool Kt/V (spKt/V) of 1.4 per hemodialysis session for patients treated thrice weekly, with a minimum delivered spKt/V of 1.2. (1B)
- 3.2 In patients with significant residual native kidney function (Kru), the dose of hemodialysis may be reduced provided Kru is measured periodically to avoid inadequate dialysis. (Not Graded)
- 3.3 For hemodialysis schedules other than thrice weekly, we suggest a target standard Kt/V of 2.3 volumes per week with a minimum delivered dose of 2.1 using a method of calculation that includes the contributions of ultrafiltration and residual kidney function. (Not Graded)

Candidates for incremental HD

Table 1 | Proposed criteria for twice-weekly hemodialysis^a

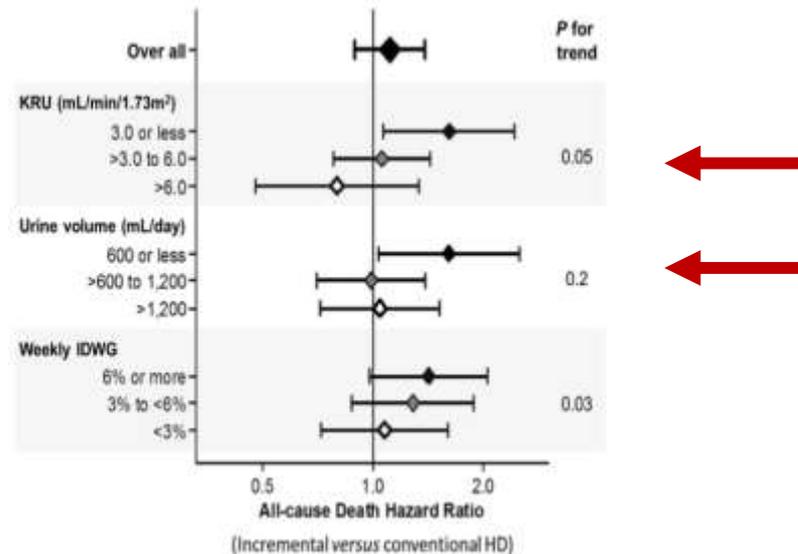
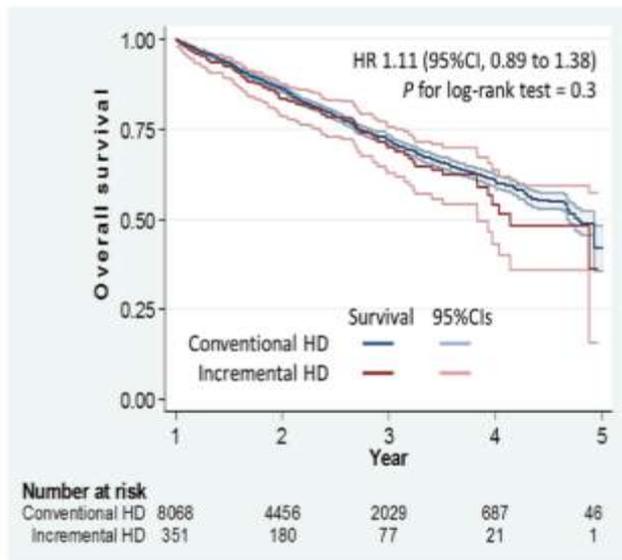
Twice-weekly hemodialysis treatment criteria

1. Good residual renal function with a urine output > 0.5 L/d
2. Limited fluid retention between 2 consecutive HD treatments with a fluid gain < 2.5 kg (or $< 5\%$ of the ideal dry weight) without HD for 3–4 d
3. Limited or readily manageable cardiovascular or pulmonary symptoms without clinically significant fluid overload^b
4. Suitable body size relative to residual renal function; larger body size may be suitable for 2x/wk HD if not hypercatabolic
5. Hyperkalemia ($K > 5.5$ mEq/L) infrequent or readily manageable
6. Hyperphosphatemia ($P > 5.5$ mg/dl) infrequent or readily manageable
7. Good nutritional status without florid hypercatabolic state
8. Lack of profound anemia ($Hb > 8$ g/dl) and appropriate responsiveness to anemia therapy
9. Infrequent hospitalization and easily manageable comorbid conditions
10. Satisfactory health-related quality of life

Implementation strategies

1. In order to initiate and maintain 2x/wk HD, the patient should meet the first criterion (urine output > 0.5 L/d) plus most (5 of 9) other criteria
2. Examine these criteria every month in all 2x/wk HD patients and compare outcome between 2x/wk and 3x/wk HD to assure outcome noninferiority for continuation of 2x/wk HD
3. Consider transition from 2x/wk to 3x/wk HD regimen if patient's urine output drops (< 0.5 L/day) or if patient's nutritional status or general health condition shows a deteriorating trend over time

Incremental Hemodialysis, Residual Kidney Function, and Mortality Risk in Incident Dialysis Patients: A Cohort Study



Limitations: Potential selection bias and wide CIs.

Conclusions: Among incident hemodialysis patients with substantial RKF, incremental hemodialysis may be a safe treatment regimen and is associated with greater preservation of RKF, whereas higher mortality is observed after the first year of dialysis in those with the lowest RKF. Clinical trials are needed to examine the safety and effectiveness of twice-weekly hemodialysis.

Studies with incremental HD



Incremental versus conventional haemodialysis in end-stage kidney disease: a systematic review and meta-analysis

Incremental HD has been advocated for a gradual transitional period based on residual kidney function (RKF). However, the safety and clinical outcomes of incremental compared to conventional HD remain uncertain.

Methods



Systematic search
MEDLINE, Scopus, and Cochrane databases



Published and unpublished studies
1990–April 2023



Incremental HD
(1–2 sessions/week)
vs.
Conventional HD
(3 sessions/week)

Results

36 studies with 138,939 patients were included



Loss of RKF

- OR 0.31 (0.25–0.39)
- P < 0.001



Hospitalization

- OR 0.44 (0.27–0.72)
- P = 0.001



Cardiovascular events

- OR 0.67 (0.43–1.05)
- P = 0.08

Incremental HD in patients with RKF ≥ 2 mL/min or UO ≥ 500 mL/d

- OR 0.22 (0.08–0.63); P = 0.004



Mortality

- OR 0.87 (0.72–1.04)
- P = 0.12

Incremental HD in patients with RKF ≥ 2 mL/min or UO ≥ 500 mL/d

- OR 0.54 (0.37–0.79); P = 0.001

No significant differences in hyperkalaemia and volume overload

Conclusion: Incremental HD is safe and attenuates hospitalization and loss of RKF compared with conventional HD. Also, incremental HD may improve cardiovascular outcomes and mortality in appropriately selected patients.

Takkavatakarn, K.
Clinical Kidney Journal (2023)
Kullaya.t@chula.ac.th
@CKJsocial

A multicenter feasibility randomized controlled trial to assess the impact of incremental versus conventional initiation of hemodialysis on residual kidney function

Enric Vilar^{1,2}, Raja M. Kaja Kamal^{1,2}, James Fotheringham^{3,4}, Amanda Busby², Jocelyn Berdeprado¹, Ewa Kisłowska¹, David Wellsted², Bassam Alchi⁵, James O. Burton^{6,7}, Andrew Davenport⁸ and Ken Farrington^{1,2}

Inclusion and exclusion criteria

Inclusion criteria were age ≥ 18 years; within 3 months of HD initiation; KRU ≥ 3 ml/min per 1.73 m²; and sufficient understanding of study procedures, including capacity for explicit agreement to be randomized to standard or incremental regimens.

Exclusion criteria were planned transplant within 3 months; anticipated requirement for high-volume ultrafiltration; blood-borne virus positivity; inability to comply with monthly interdialytic urine collection; pregnancy; and prognosis of < 12 months as judged by the principal investigator.

55 patients randomized (one third)

RKF loss

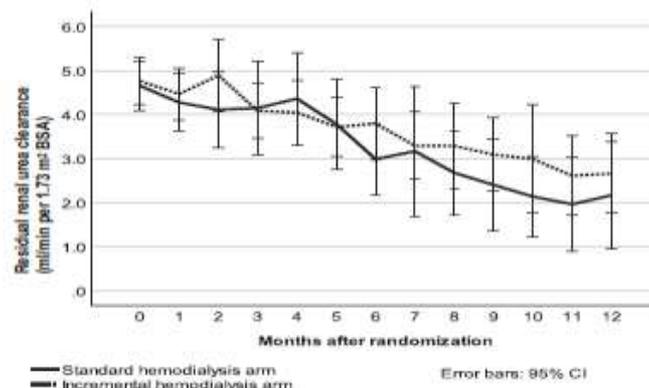


Figure 4 | Loss of residual renal urea clearance after randomization in both study arms. Month 0 is the screening visit (pre-randomization). BSA, body surface area; CI, confidence interval.

SAE

Table 2 | Summary of serious adverse events and reportable adverse events

Outcomes	Standard HD arm	Incremental HD arm	Crude IRR (95% CI) ^a	P value ^b
Patient-months in study, N	204.8	287.0		
Hospitalization events, n (hospitalization rate per person-years)	32 (1.87)	14 (0.59)	0.31 (0.17–0.59)	$< 0.001^c$
Days hospitalized, N	311	81		0.22 ^d
Deaths, n (events per person-years)	3 (0.18)	3 (0.13)	0.71 (0.14–3.54)	0.71 ^c
Adverse events, n (events per person-years)				
Major adverse cardiovascular	2 (0.12)	1 (0.04)	0.36 (0.03–3.94)	0.36 ^c
Vascular access	13 (0.76)	9 (0.38)	0.49 (0.21–1.16)	0.10 ^c
Hyperkalemia	4 (0.23)	1 (0.04)	0.18 (0.02–1.60)	0.11 ^c
Fluid overload	3 (0.18)	2 (0.08)	0.48 (0.08–2.85)	0.49 ^c
Respiratory infection	7 (0.41)	5 (0.21)	0.51 (0.16–1.61)	0.25 ^c
Other important medical events or hospitalizations unrelated to dialysis	15 (0.88)	6 (0.25)	0.29 (0.11–0.74)	0.009 ^c
SAEs probably or possibly related to dialysis regime ^e				
Events, n (events per person-years)	32 (1.87)	21 (0.88)	0.47 (0.27–0.81)	0.007 ^c
Proportion of patients experiencing ≥ 1 event	50%	52%		0.56 ^f

RCTs underway comparing incr. HD vs standard 3wk HD

IHDIPHDIP (Spain)

multicenter RCT experimental open trial. 154 patients.

REAL LIFE (Italy)

pragmatic, prospective, multicentre, open label RCT, investigator-initiated 116 patients

INCH-HD (Australia) 372 patients

TWOPLUS (USA) 350 patients

INCH-VETS (USA) 252 patients

Incremental hemodialysis (HUG) : (2013-2023)

- 2013- 16: 172 incident patients (32 PD, 140 HD) **17** patients **10 %**
- 2017-19: 124 incident patients (37 PD, 85 HD) **43** patients **51 %**
- 2020-22: 86 incident patients (8 PD, 78 HD) **52** patients **67 %**

Among 303 incident HD patients, 112 (37 %) were on incremental HD

Incremental hemodialysis (HUG)

Outcomes of incident patients treated with incremental haemodialysis as compared with standard haemodialysis and peritoneal dialysis

Background

The majority of patients requiring dialysis start on thrice-weekly haemodialysis (TW-HD) in resource-rich countries. We compared outcomes of patients initiating with TW-HD, twice-weekly incremental HD (I-HD) and peritoneal dialysis (PD).

Methods



Switzerland



Single centre
Observational cohort



313 patients initiating
from 2013 to 2020:

- 166 TW-HD
- 68 I-HD
- 79 PD

Results

Transition from I-HD to TW-HD: 9.8 +/- 9.1 months

Reference:
TW-HD

Overall
survival



Hospitalisation
at one year



I-HD

HR 0.49

95% CI 0.26 to 0.93

p = 0.029

β -0.89

95% CI -1.89 to 0.09

p = 0.077

PD

HR 1.15

95% CI 0.65 to 2.02

p = 0.625

β -0.35

95% CI -1.74 to 1.02

p = 0.612

Conclusion

I-HD is suitable for selected patients starting dialysis and can be maintained for a significant amount of time. Initiation with I-HD is associated with improved survival as compared to TW-HD or PD.

Incremental hemodialysis (HUG)

Table 3. Baseline characteristics according to transition from I-HD to TW-HD

	Stayed on I-HD (N = 19)	Transitioned to TW-HD (N = 45)	P-value
Age (years)	58.9 ± 15.9	61.1 ± 16.7	0.634
Gender (men)	13 (68.4%)	32 (71.1%)	0.830
Smoker	4 (21.0%)	19 (33.3%)	0.164
Diabetes	1 (5.2%)	17 (38.6%)	0.007
HT	13 (68.4%)	38 (86.3%)	0.096
CV disease	6 (31.5%)	19 (43.1%)	0.388
Charlson score	5.3 ± 2.1	6.5 ± 2.9	0.112
AVF	10 (52.6%)	15 (34.8%)	0.106
Urgent KRT initiation	6 (31.5%)	15 (33.3%)	0.891
eGFR at KRT initiation (mL/min/1.73 m ²)	5.5 ± 2.2	6.6 ± 2.5	0.105
KRU (mL/min)	3.8 ± 1.7	3.1 ± 2.2	0.331
Urine output at KRT initiation (mL)	2144 ± 776	1780 ± 791	0.096

Four patients on I-HD who recovered from dialysis during follow-up were excluded from this analysis (see Supplementary data, Fig. S2).

Abbreviations: CV, cardiovascular; HT, hypertension.

Bold values indicate $P < 0.05$.

Table 4. Selected outcomes at 1 year

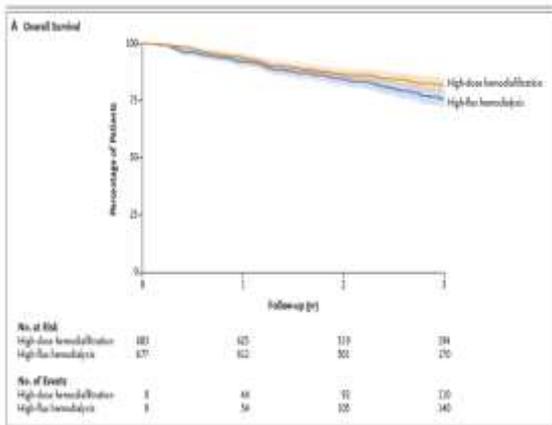
	TW-HD (N = 166)	I-HD (N = 68)	PD (N = 79)	P-value
Mortality	36 (21.6%)	5 (7.3%)	11 (13.9)	0.021
Hospitalization days	27 (11–69)	18 (3–46)	16 (3–48)	0.003
Urine output (mL)	NA	1291 ± 810	1392 ± 656	0.429
Decline in urine output from baseline ^a (%)	NA	33.3 ± 31.2	23.3 ± 24.1	0.041

^aPatients who increased their urine output between baseline and 1-year follow-up were considered to have a decline of 0%.

Bold values indicate $P < 0.05$.

Do not forget «Convince»

Nov 2018-Avril 21 :
1407 eligible patients
Median FU : 30 mois
Convection vol: 25.3 L



HR, 0.77; 95% CI, 0.65 -0.93

Table 1. Characteristics of the Patients at Baseline.*

Characteristic	High-Dose Hemodiafiltration (N= 683)	High-Flux Hemodialysis (N= 677)
Age—yr	62.5±13.5	62.3±13.5
Female sex — no. (%)	247 (36.2)	257 (38.0)
Region — no. (%)		
Western Europe	223 (32.7)	218 (32.2)
Eastern Europe	234 (34.3)	233 (34.4)
Southern Europe	226 (33.1)	226 (33.4)
Cardiovascular disease — no. (%) †		
Any	296 (43.3)	316 (46.7)
Coronary heart disease ‡	130 (19.0)	147 (21.7)
Diabetes mellitus — no. (%)	230 (33.7)	251 (37.1)
Smoking — no./total no. (%)		
Never	360/683 (52.7)	318/673 (47.3)
Current	98/683 (14.3)	109/673 (16.2)
Past	225/683 (32.9)	246/673 (36.6)
Alcohol consumption — no./total no. (%)		
Never	357/679 (52.6)	343/674 (50.9)
Current	175/679 (25.8)	199/674 (29.5)
Past	147/679 (21.6)	132/674 (19.6)
Body-mass index — no. (%) §	27.4±5.6	27.5±5.7
Body-surface area — m ² ¶	1.86±0.22	1.86±0.22
Blood pressure before dialysis — mm Hg		
Systolic	141±22	141±22
Diastolic	73±14	72±15
Heart rate before dialysis — beats/min	72±11	72±12
Laboratory values		
Hemoglobin — g/dl	11.3±1.2	11.3±1.2
Serum creatinine — mg/dl ¶	7.4±2.5	7.3±2.3
Serum urea — mg/dl	70.6±30.5	71.4±32.7
Median C-reactive protein (IQR) — mg/liter	5 (2–11)	4 (2–10)
Serum phosphate — mg/dl	4.9±1.5	4.9±1.4
Blood flow — ml/min**	369±54	367±56
Median residual urinary output (IQR) — ml/24 hr	850 (500–1300)	800 (444–1200)
Dialysis		
Median vintage (IQR) — mo	35 (16–78)	30 (14–67)
Median duration of session (IQR) — min	240 (240–248)	240 (240–245)
Median single-pool Kt/V (IQR) ††	1.61 (1.45–1.83)	1.61 (1.42–1.80)
Vascular access — no. (%)		
Fistula	558 (81.7)	557 (82.3)
Catheter	90 (13.2)	94 (13.9)
Graft	35 (5.1)	26 (3.8)
Previous kidney transplantation — no. (%)	93 (13.6)	79 (11.7)



Incremental dialysis in incident patients: **in addition to residual kidney kunktion (RKF)**

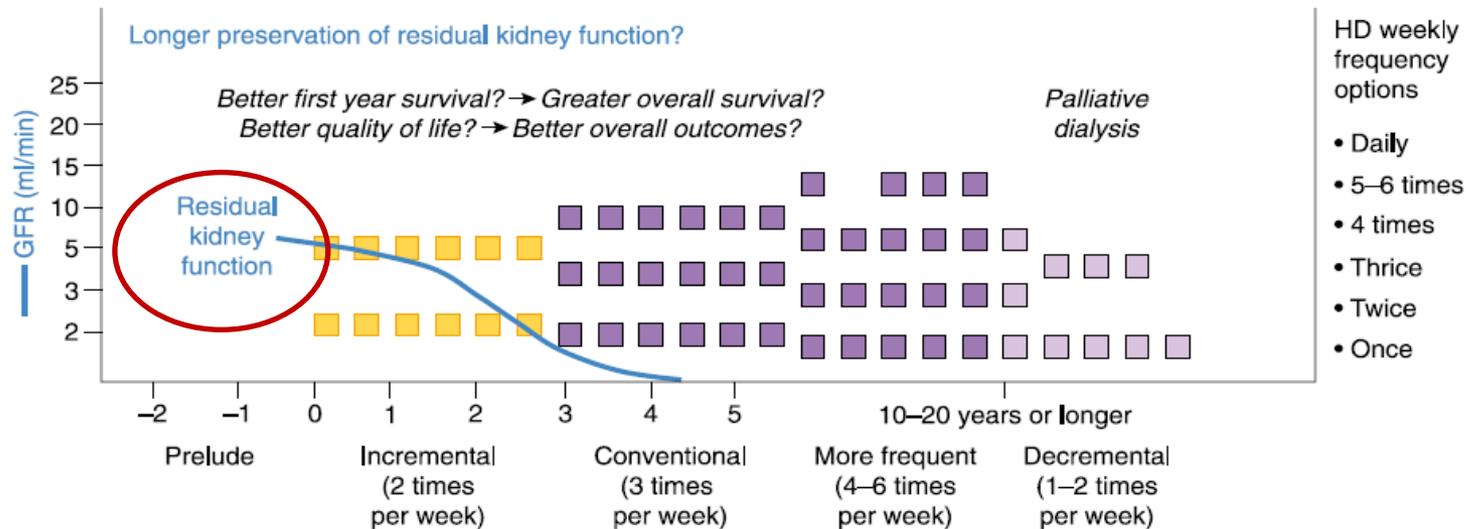


Figure 1. | Schematic representation of the incremental dialysis program with twice-weekly hemodialysis (HD) initiation. Each block represents a weekly HD therapy. Blocks in yellow represent the period of incremental transition to twice-weekly HD, whereas dark violet blocks illustrate increase in dialysis frequency to thrice weekly or more frequently as needed. Light violet blocks highlight the transition to a palliative dialysis protocol with less-frequent HD therapy. Adapted from ref. 2, with permission.

How to estimate (KrU) ?

24-hr urine collection

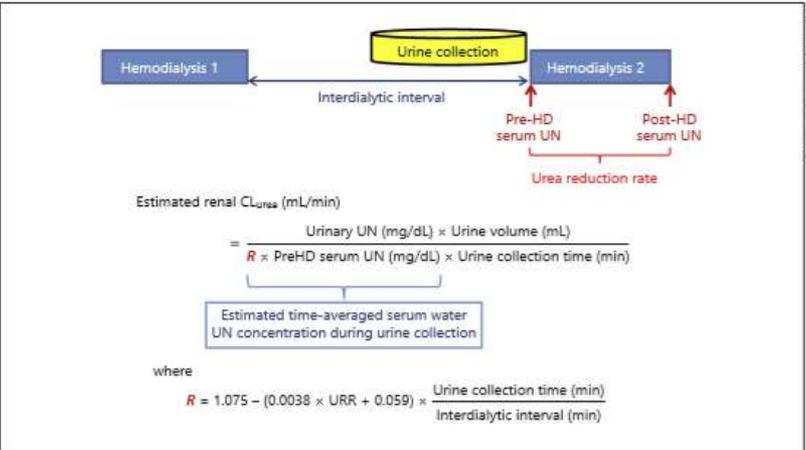


Fig. 1. How to estimate renal urea clearance (CL_{urea} or KrU). R is a factor for predialysis serum urea nitrogen (UN) to estimate the time-averaged serum water UN concentration during urine collection. The value of 1.075 in R is simply 1/0.93 and results from the need to correct the predialysis urea concentration for serum water. Urine collection is supposed to be completed 1 h before the subsequent dialysis treatment. HD, hemodialysis.

How to adapt incremental HD to RKF ?
 «Solute-solver»
Daugirdas et al, AJKD 2009
 «Speedy»
Casino et al. NDT 2018

Daugirdas et al. [20]	A factor of 0.9 is used for the predialysis SUN to estimate the time-averaged concentration during a urine collection	Simple; does not require postdialysis SUN	Overestimates RKF by 4.5% on average, with a larger error with less frequent hemodialysis [21]
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Hur et al. Cardioren Med 2019, Daugirdas et al. AJKD 2009

NB: 24-u urine volume more associated with prognosis than small molecules clearance ?

Lee et al. CJASN 2017

Okasaki et al. KI Reports 2021 (cave < 900ml ...)

What is done presently in our dialysis unit

1-2 HD wk sessions

HD patients with a daily residual diuresis > 600 ml, an urea clearance > 2 ml/mn and an interdialytic weight intake < 2,5 kgs.

session duration: variable

≥ 3 HD wk sessions:

session duration: variable

post-dilution hemodiafiltration (HDF) favored and targeting a 23l convection volume/session

On May 17th:

- 23 PD patients, **55 HD patients**
- 32 with 3 wk HD sessions (mean session duration 225 mn (180-255))
- 4 with 4-5 wk HD sessions (mean session duration 208 mn (180-270))
- 19 with 2 wk HD sessions (mean session duration 206 mn (120-240))

Towards a «patient-oriented» dialysis

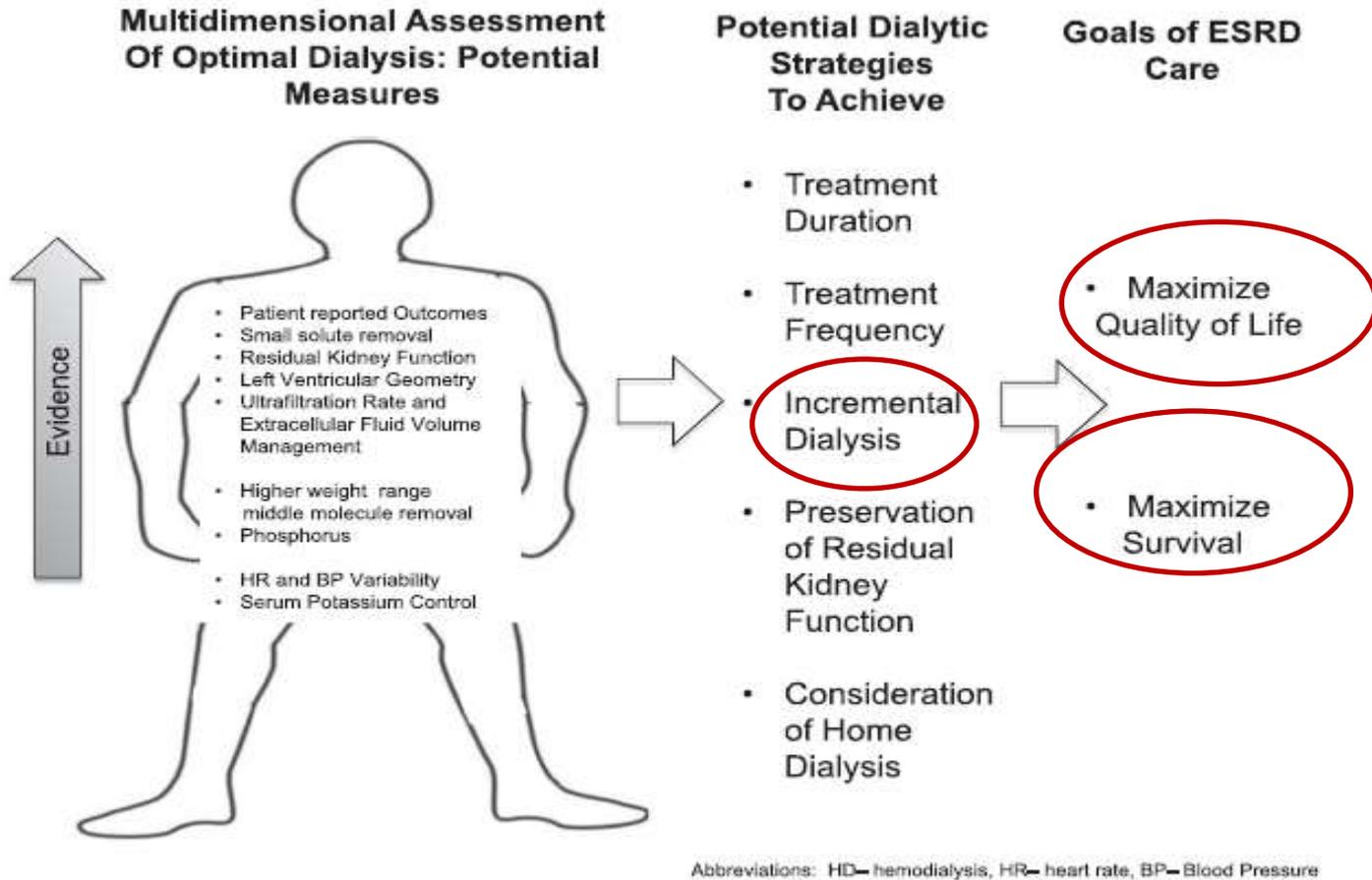


Figure 1. | Multidimensional Measure of Dialysis. HR, heart rate.

Conclusion

«One size does not fit all»; towards a more personalized approach

Still ethical to provide every ESKD patient with thrice-weekly 4-hour hemodialysis sessions?

May be inadequate in incident patients with preserved RKF

Incremental HD (IHD)

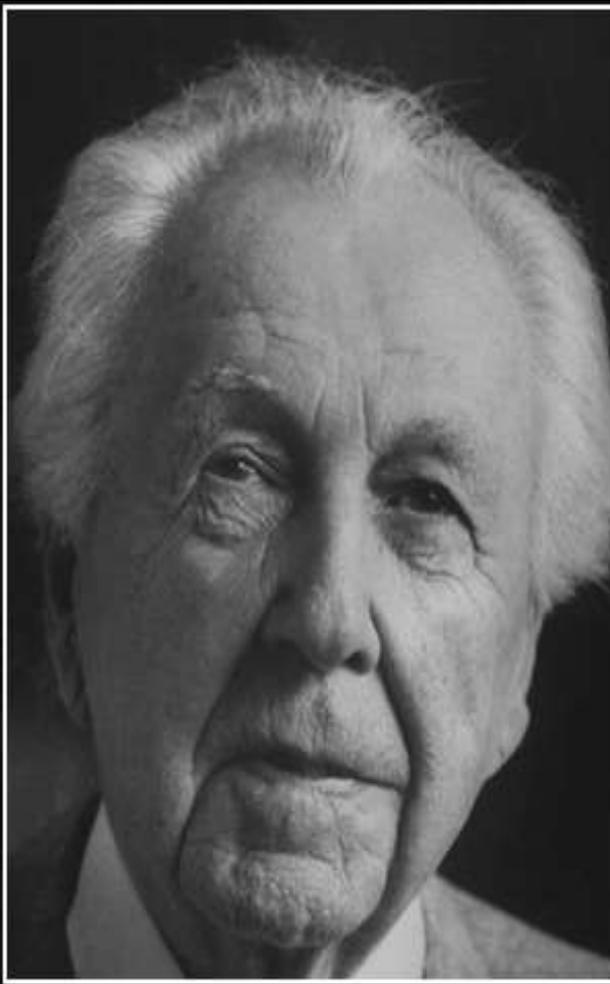
-tailored to incident HD patients in addition to RKF

-may preserve RKF and improve QoL.

-careful frequent monitoring of RKF mandatory

-forewarn patients about temporary feature of IHD

-results of prospective trials eagerly awaited



Less is more only when more is too
much.

— *Frank Lloyd Wright* —

AZ QUOTES

Thank you for your attention