self-care dialysis symposium

4ème Symposium de Dialyse Extra-Hospitalière

Les 6 et7 juin 2018

Square-Brussels Meeting Centre

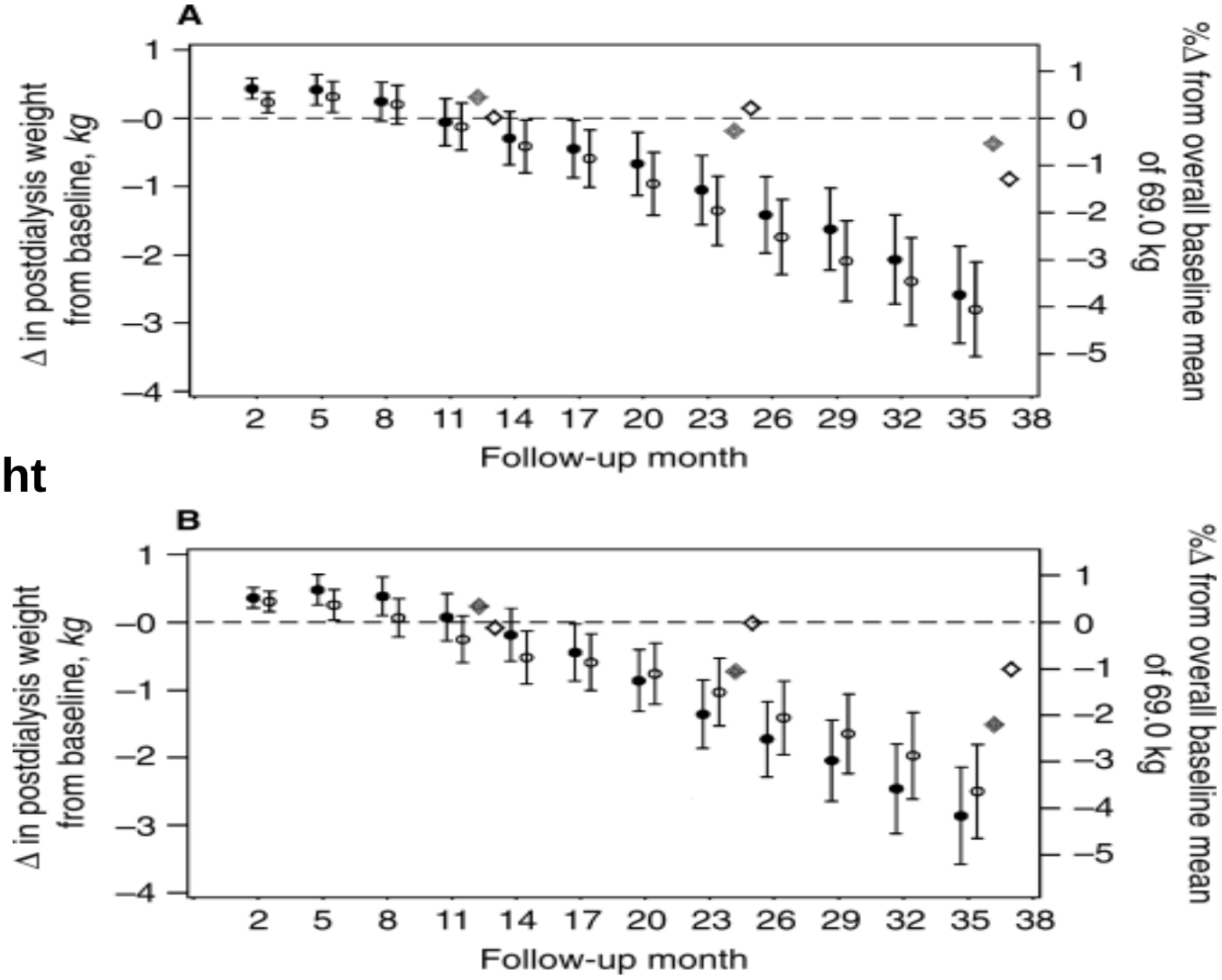
Nutrition en dialyse : controverses

La relation dialyse et nutrition

Charles Chazot, MD
NephroCare Tassin-Charcot
Sainte Foy Les Lyon, France

HEMO study lessons (1)

Body weight



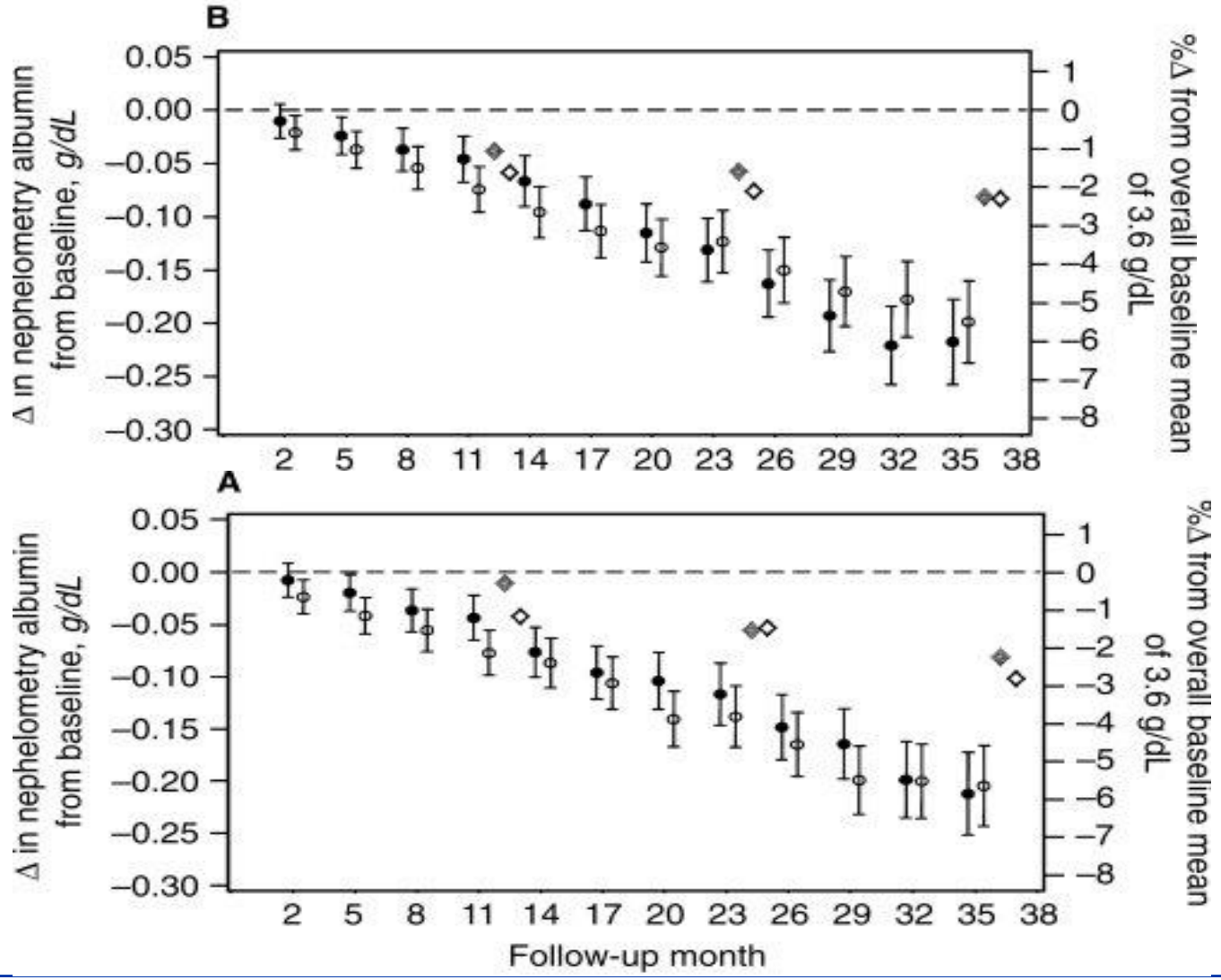
Dose

flux

Rocco , Kidney Int 2004

HEMO study lessons (2)

S-Alb



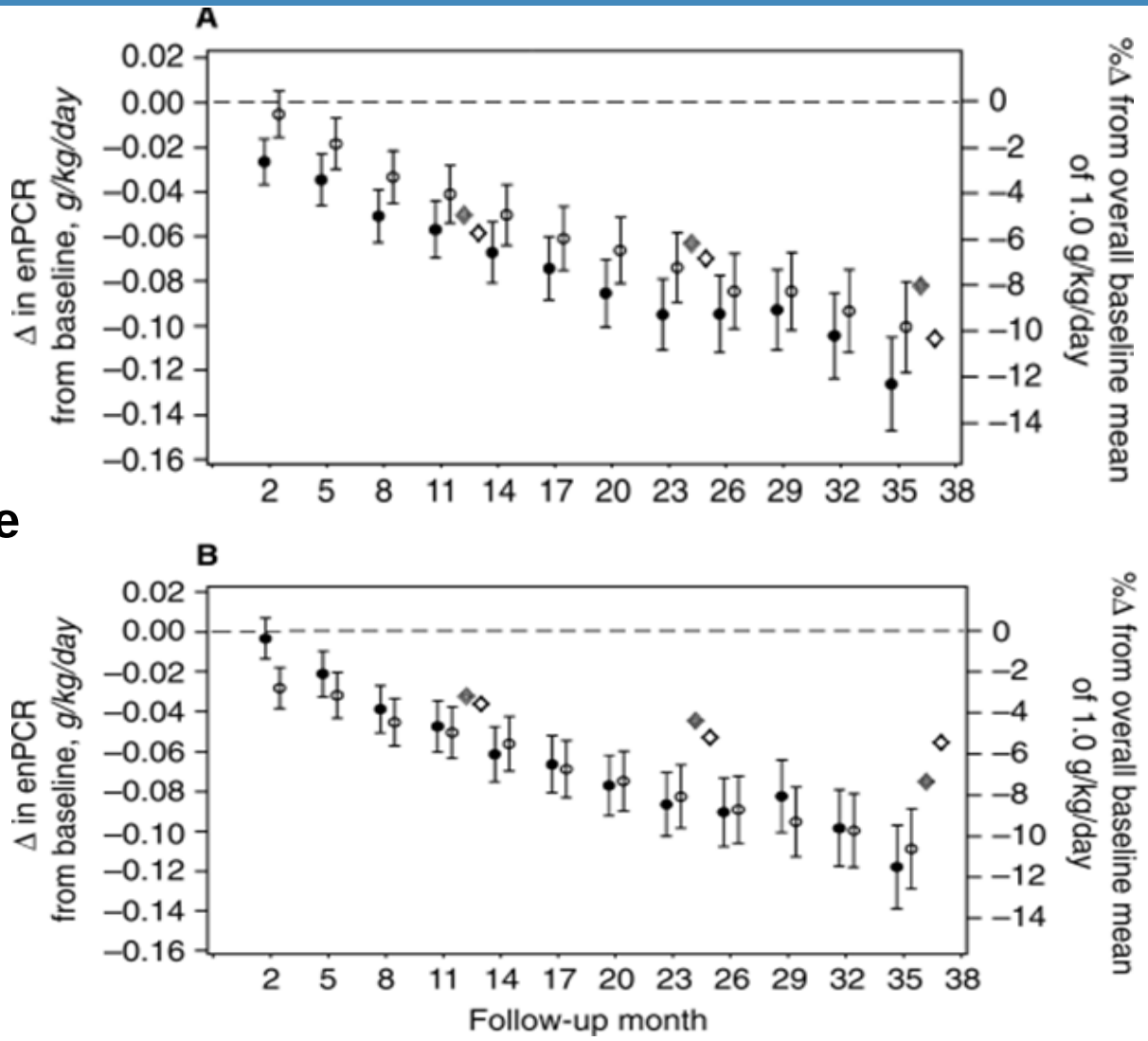
Dose

flux

Rocco , Kidney Int 2004

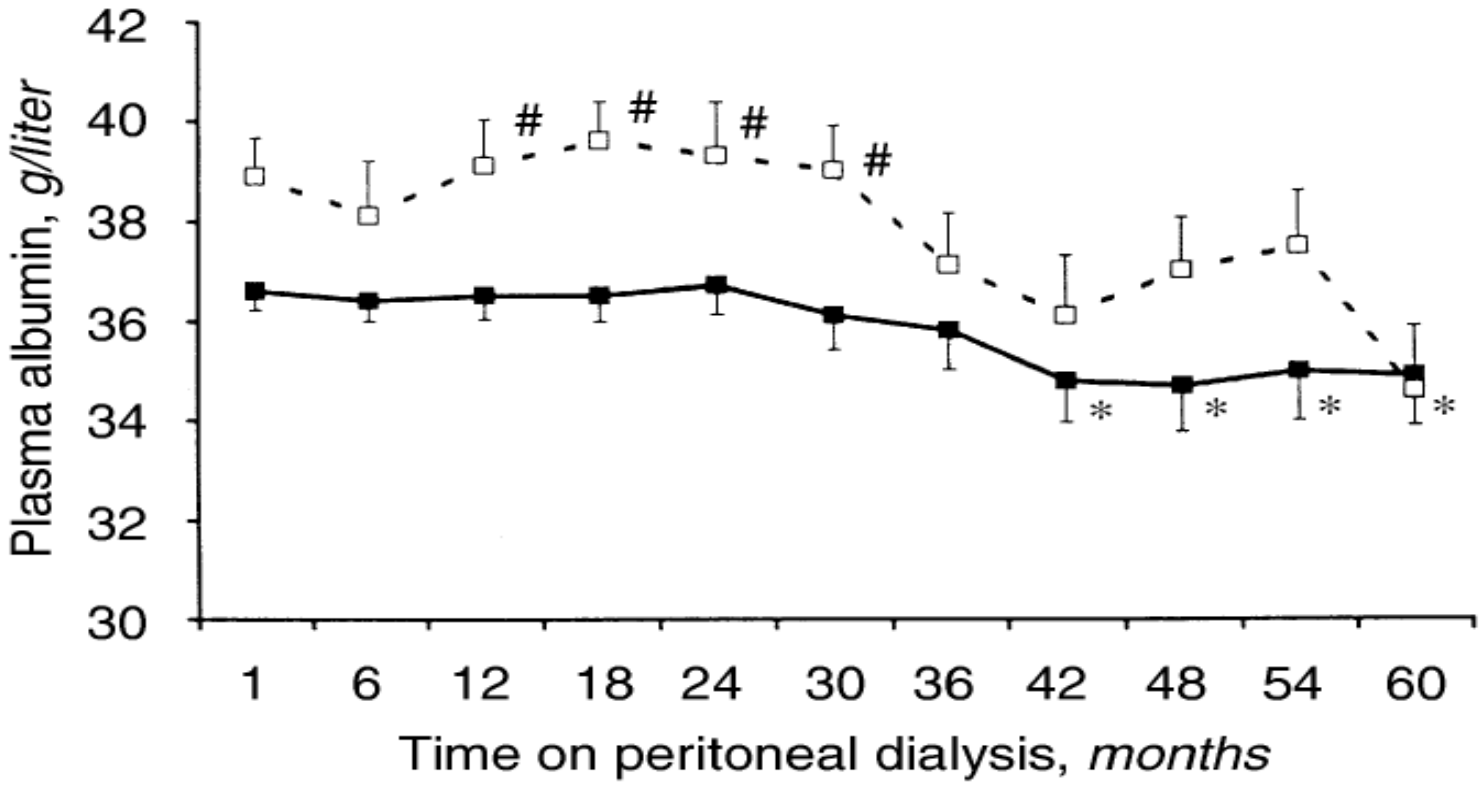
HEMO study lessons (3)

Protein intake



Rocco , Kidney Int 2004

S-Albumin in PD patients



Idem for BW and Mid-arm circumference

Davies KI 1998

Causes of PEW in dialysis patients

A multifactorial issue

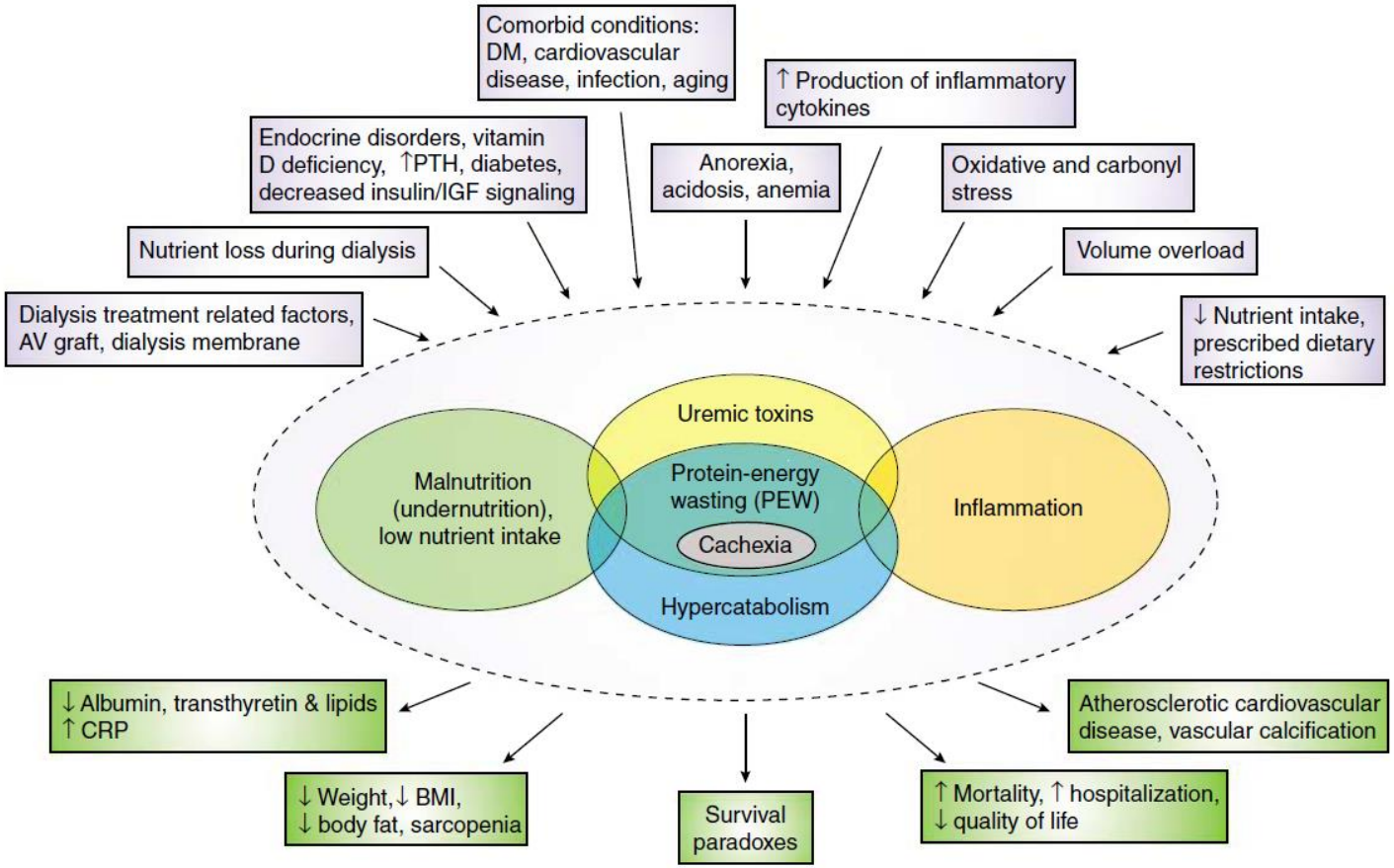


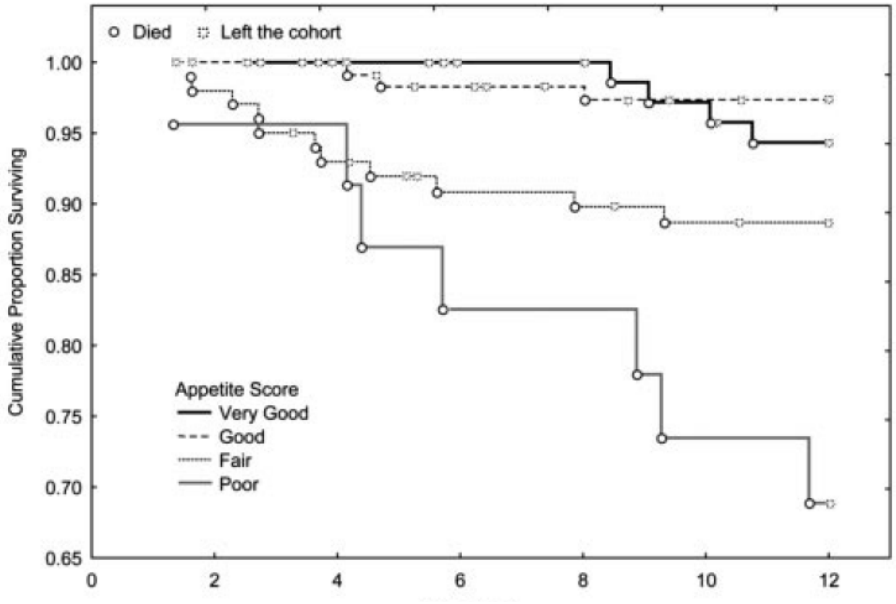
Figure 1 | Schematic representation of the causes and manifestations of the protein–energy wasting syndrome in kidney disease.

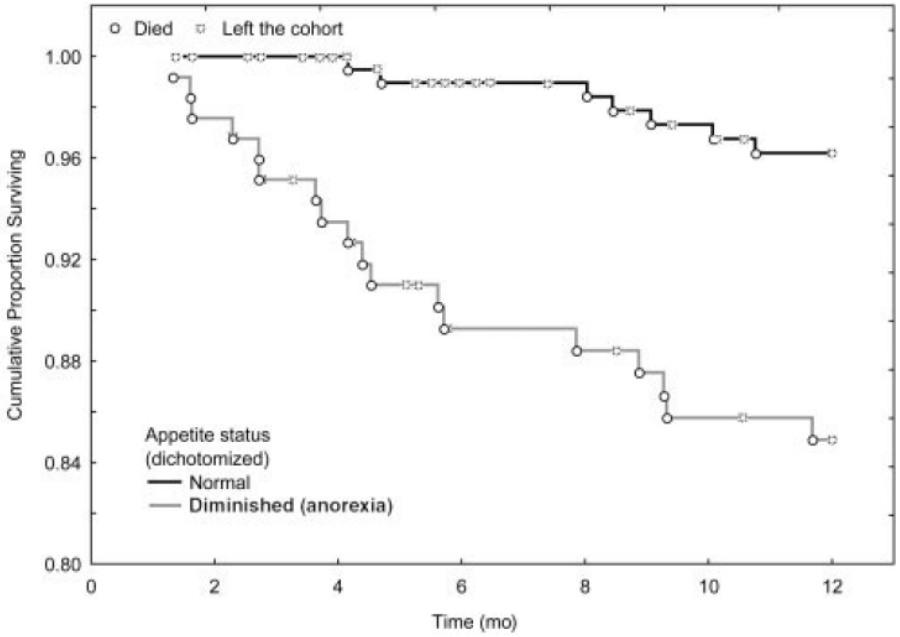
Fouque. Kidney Int 2008

Does Home Dialysis Therapy prevents Protein-Energy Wasting?

1	**Never forget the basics!**
2	**Peritoneal Dialysis versus Hemodialysis**
3	**Nutritional Effect of Alternative Hemodialysis Strategies**
4	**Nutritional Effects of HD convective therapies**
5	**Just a reminder…**
6	**Take Home Message**

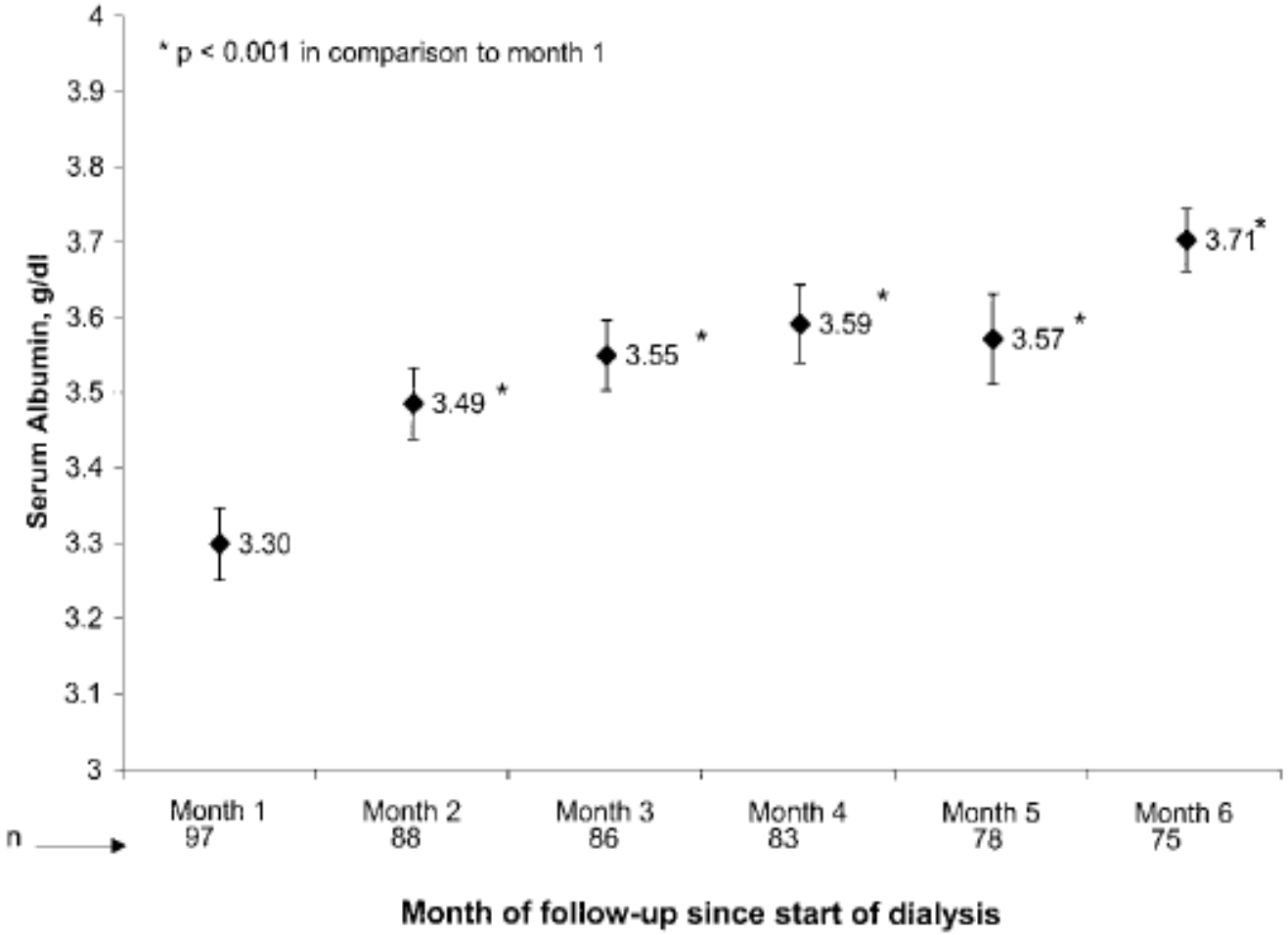
Appetite score and HD patients survival





Kalantar-Z Am J Clin Nutr 2004

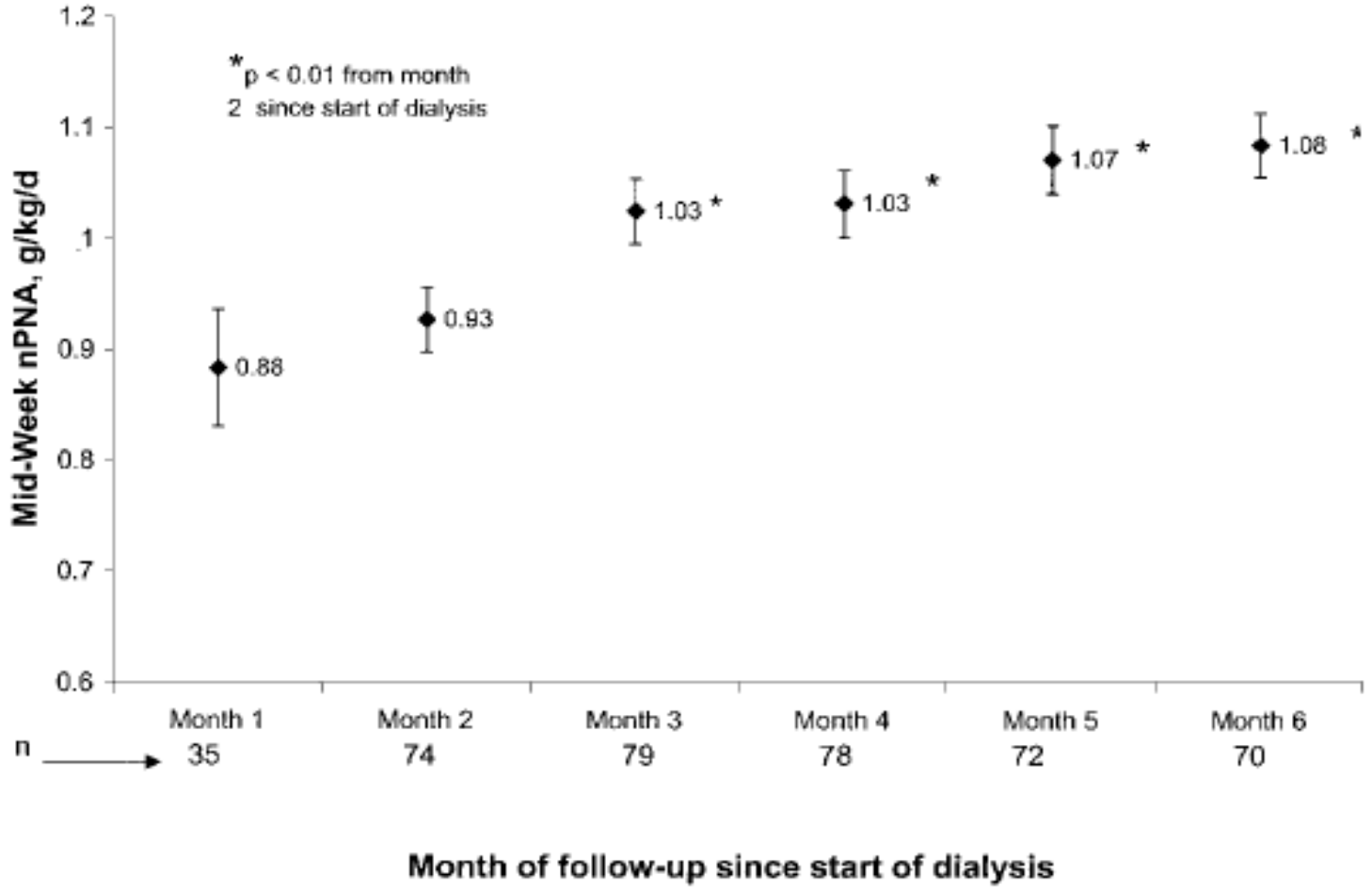
Improvement of S Alb level with standard dialysis in incident dialysis patients



Retrospective study in 97 incident patients

Mehrotra AJKD 2002

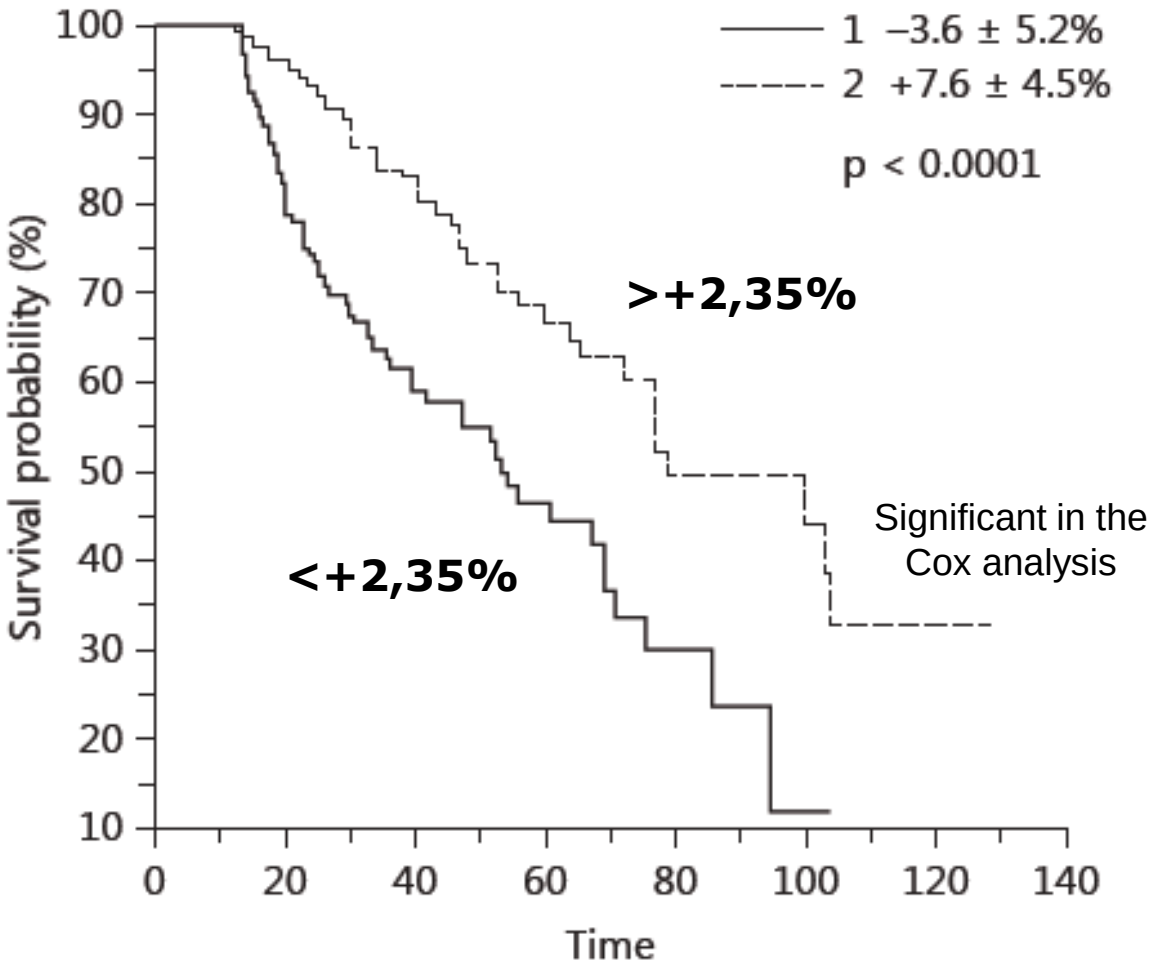
Improvement of protein intake with standard dialysis in incident dialysis patients



FRESENIUS MEDICAL CARE

Mehrotra, AJKD 2002

Survival in incident HD patients
Effect of Target Weight change in the 1 year of HD therapy



Chazot Nephron Clin Pract 2014

Blood access and nutritional parameters

12501 patients 23% with a permanent catheter

	All	AVF	AVG	CVC
Patients	12,501	4,486	5,181	2,834
Ferritin, ng/ml	719 ± 445	725 ± 439	731 ± 448	688 ± 450
Transferrin saturation, %	30 ± 13	31 ± 13	30 ± 13	30 ± 15
Hemoglobin, g/dl	12.0 ± 1.4	12.0 ± 1.3	12.0 ± 1.5	11.9 ± 1.4
EPO, units/kg/week	246 ± 235	221 ± 211	247 ± 237	283 ± 261
URR, %	73.0 ± 6.6	72.8 ± 6.2	74.0 ± 5.9	71.4 ± 7.8
Kt/V	1.55 ± 0.31	1.53 ± 0.29	1.59 ± 0.32	1.51 ± 0.34
Albumin, g/dl	3.8 ± 0.5	3.9 ± 0.4	3.9 ± 0.4	3.7 ± 0.5

Patients with a permanent catheter: significant lower SAlb level after adjustment for blood access type, age, vintage, KT/V, race

A native fistula will help the patient even in nutrition (better dialysis delivery, less inflammation,…)

Chand, Nephron Clin Pract 2010

Relationship between dialysis dose and food intake

50 patients with Urea Monitor® and 7-day food records

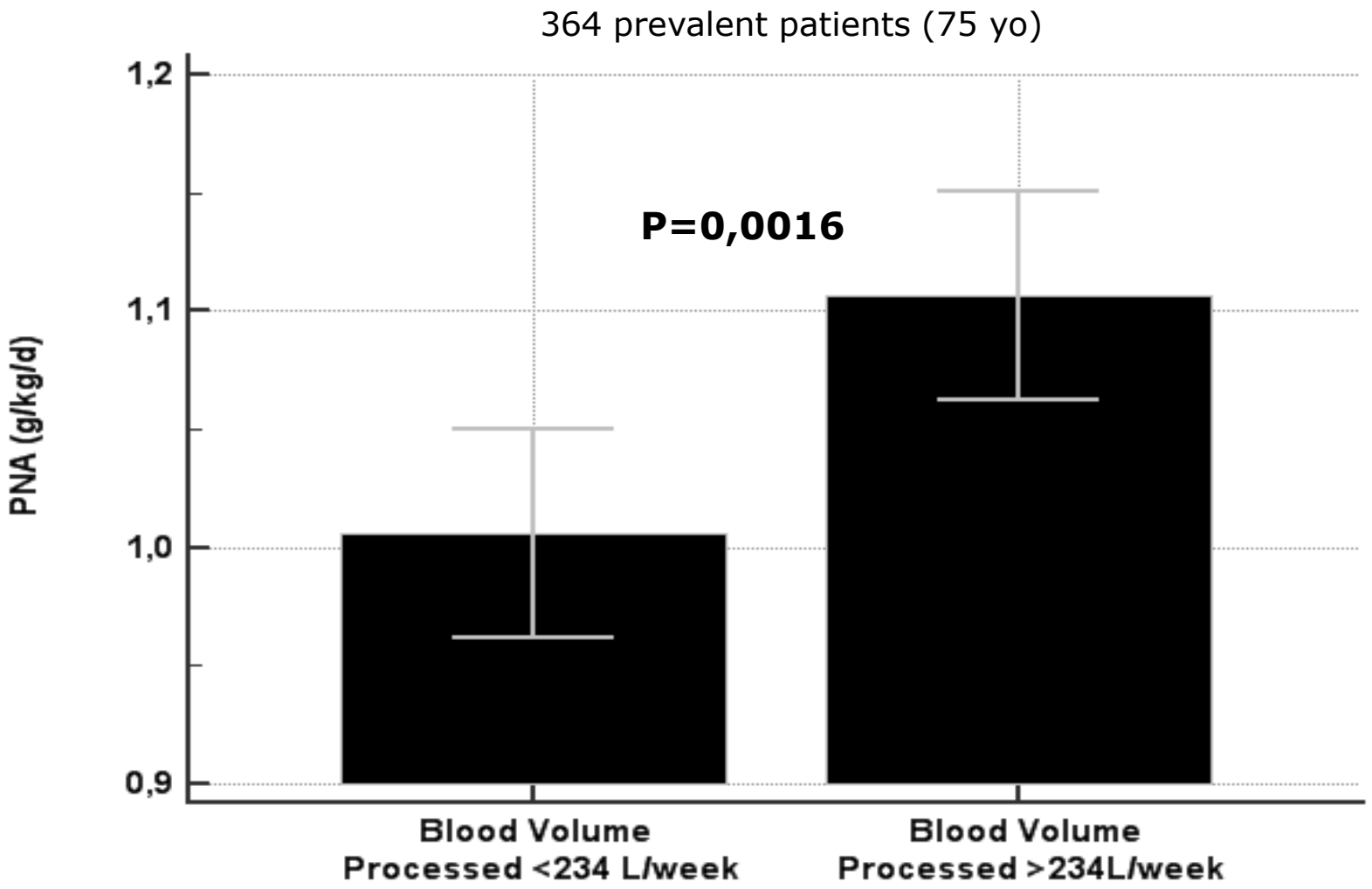
Table 3. Analysis of variance, residual *F*-test between Kt/V, nPCR, DPI and calorie intake.

K_t/V U. M.	K_t/V 2	nPCR	DPI	Calories
K_t/V U. M.	0.001	0.0001	0.002	0.006
K_t/V 2		0.01	0.09	0.2
nPCR			0.0001	0.003
DPI				0.0001

No mathematical flaw….

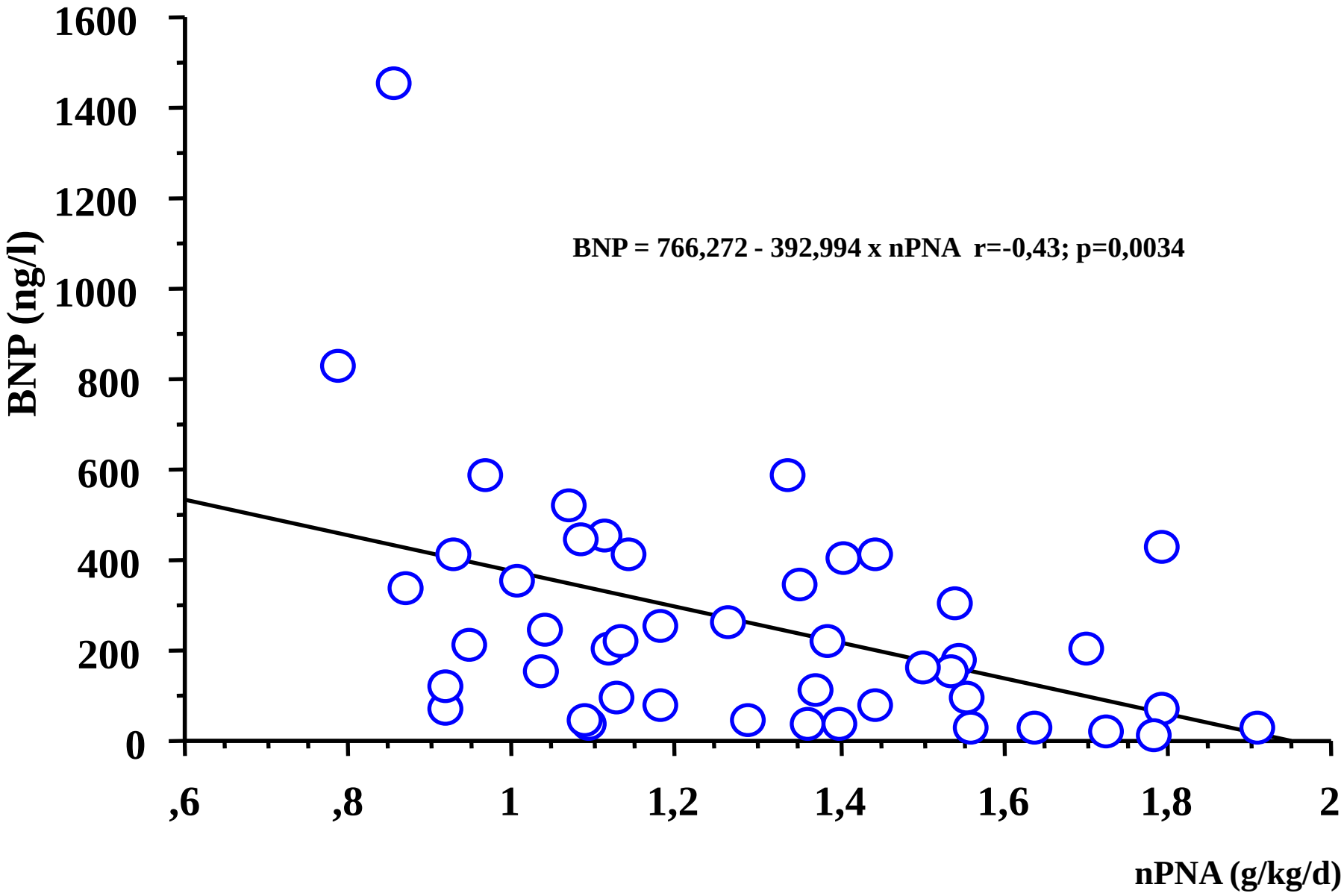
Chauveau NDT 1996

nPNA according to the Processed Blood Volume



Dialysis parameters and nPNA

	nPCR>1,0 g/kg/d		nPCR>1,2 g/kg/d	
Variable	**AUC**	**Criterion**	**AUC**	**Criterion**
Proc. BV	**0,624**	**>203 l/week**	**0,606**	**>228 l/week**
Weekly TT	**0,630**	**>701 min**	**0,620**	**>768 min**
OCM	**0,573**	**>1,49**	**0,568**	**>1,62**



Fluid excess may impair appetite and nutritional status

Chazot Blood Purif 2009

- La dose de dialyse
- L’abord vasculaire
- Le contrôle de l’hydratation

Préalables à un état nutritionnel correct

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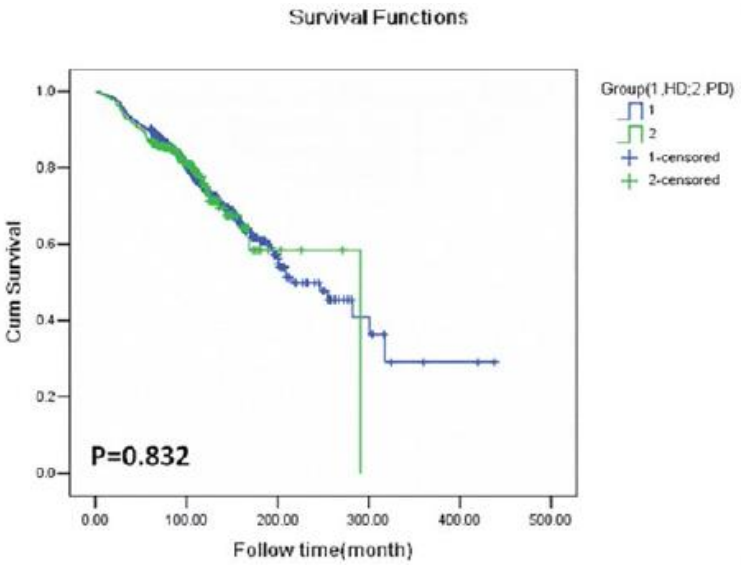
Standard HD versus PD
The Chinese-Italian cohort study

- 509 HD vs 410 PD
- Shangai and Vicenza Renal Registries
- 2009-2013
- Retrospective study
- Mean data during the 5-year follow-up
- Switched or Transplanted patients excluded



	HD (n = 509)	PD (n = 410)
HCO_3 (mmol/L)	21.68 ± 4.03	25.48 ± 4.44#
CRP (mg/l)	3.0 (0.91,12.56)	3.93 (0.84,22.23) #
Total cholesterol (mmol/L)	4.21 ± 1.07	4.81 ± 1.26#
Albumin (g/L)	39.27 ± 11.24	37.56 ± 5.16#

Lu Int J Art Organs 2018

Home Short Daily HD versus PD therapy

2x4201 matched incident patients H SD HD vs PD

NxStage….

	All Patients			
Intention to Treat	**Daily HHD**	**PD**	**RR[a] (95% CI)**	***P***
Cachexia/dialysis withdrawal	1.4	2.1	0.62 (0.48-0.80)	<0.001
Cachexia/dialysis withdrawal	1.3	1.9	0.68 (0.50-0.93)	0.02
On Treatment				

Cachexia refers to Nutrition?: Unclear…

PD versus Daily Home HD

- 41 PD vs 47 Home HD patients (Standard Thrice Weekly?)
- Cross-sectional Bioimpedance study
- Extracellular fluid excess significantly higher in PD vs Home HD patients (46 vs 21%)
- No difference on malnutrition criteria in PD vs Home HD patients

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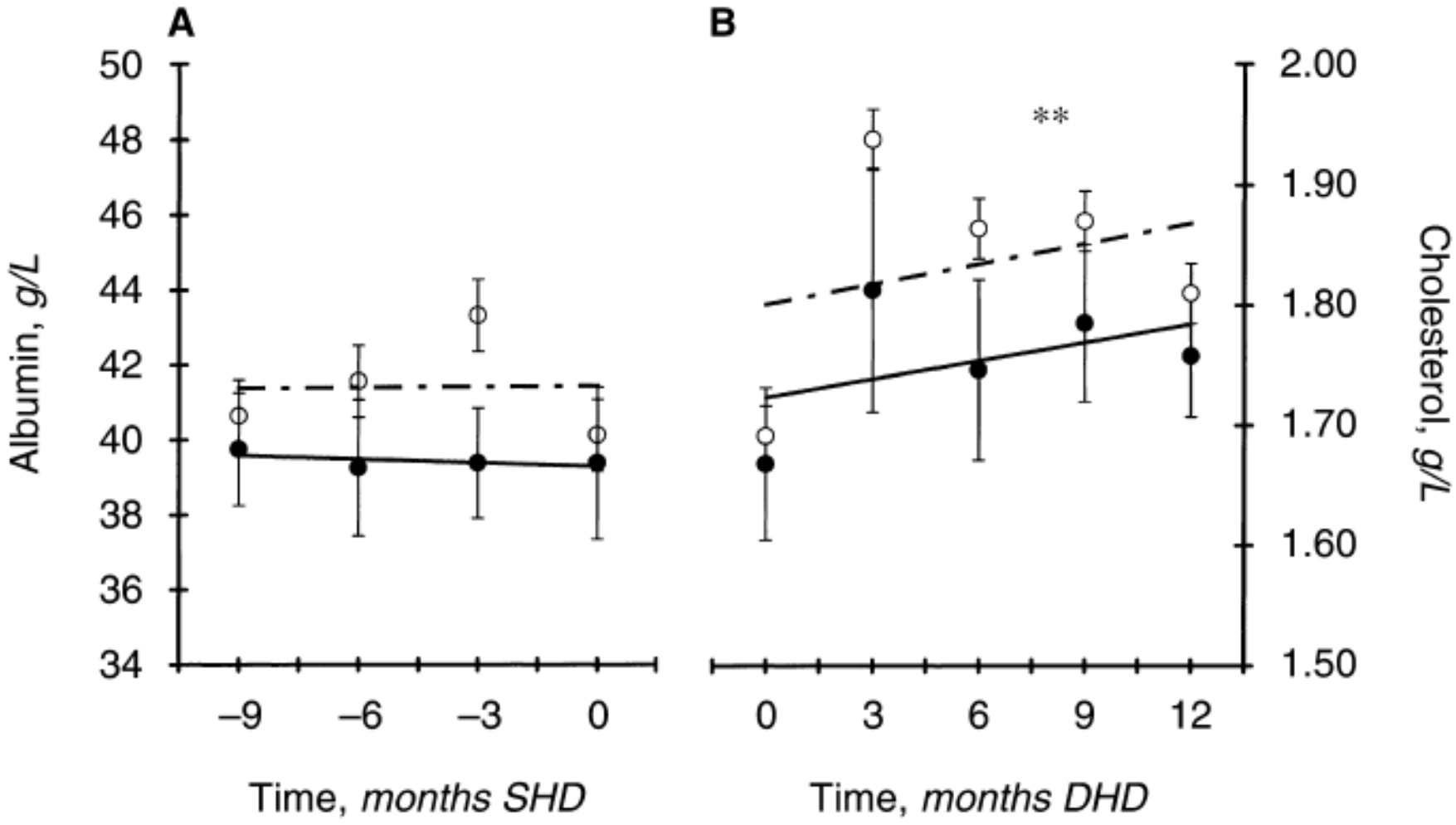
What is longer and/or more frequent hemodialysis?

- The « Tassin » or « Izmir » model: 6-8 hours x3/week (Charra KI 1992; Ok NDT 2011; Lacson cJASN 2010)
- The Alternate dialysis model: 8h X 3.5 times/week (Kerr Sem Dial 2011)
- Daily long nocturnal model : 6-8 h x5-6/week (Pierratos KI 2004; Rocco FHN KI 2011)
- Short Daily model: 2hx6/week (Galland KI 2004, Chertow FHN NEJM 2010)
- Extra-session per week: common practice
- Individualized therapy

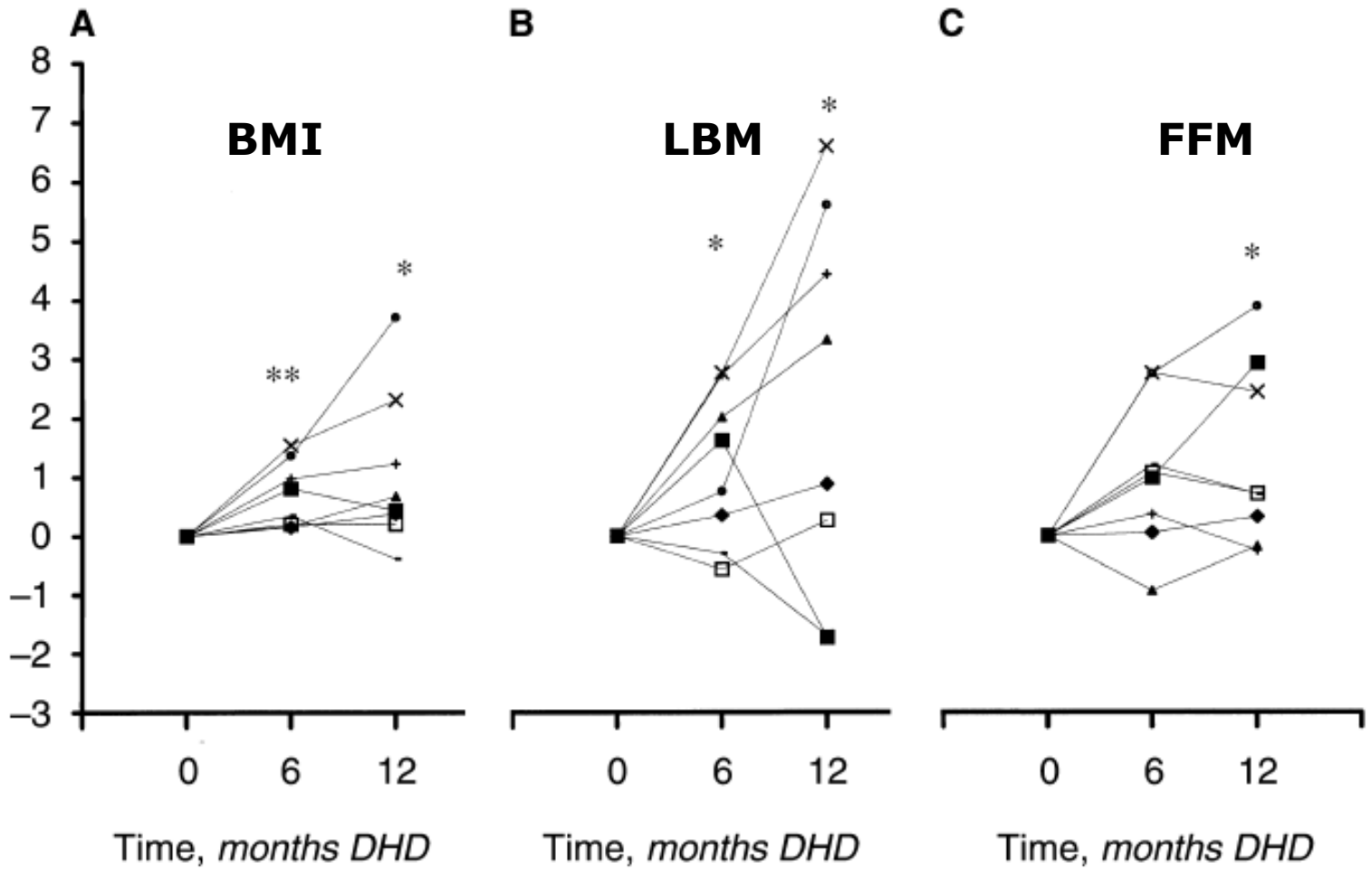
Daily Short HD

Switch from conventional to daily short hemodialysis (1)



Galland KI 2001

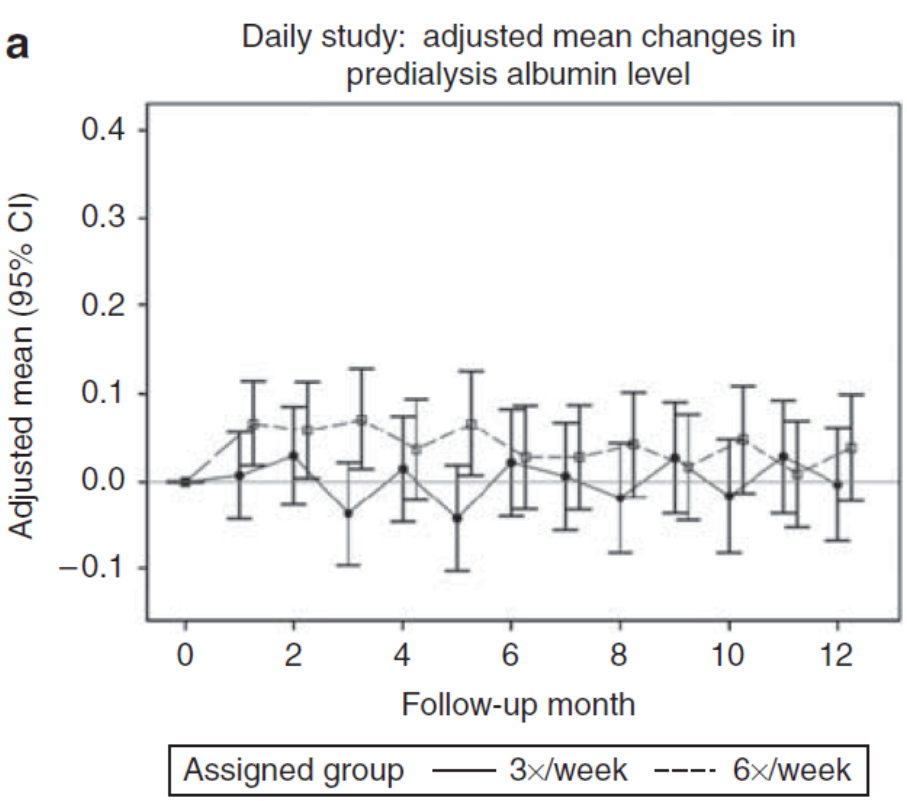
Switch from conventional to daily short hemodialysis (3)

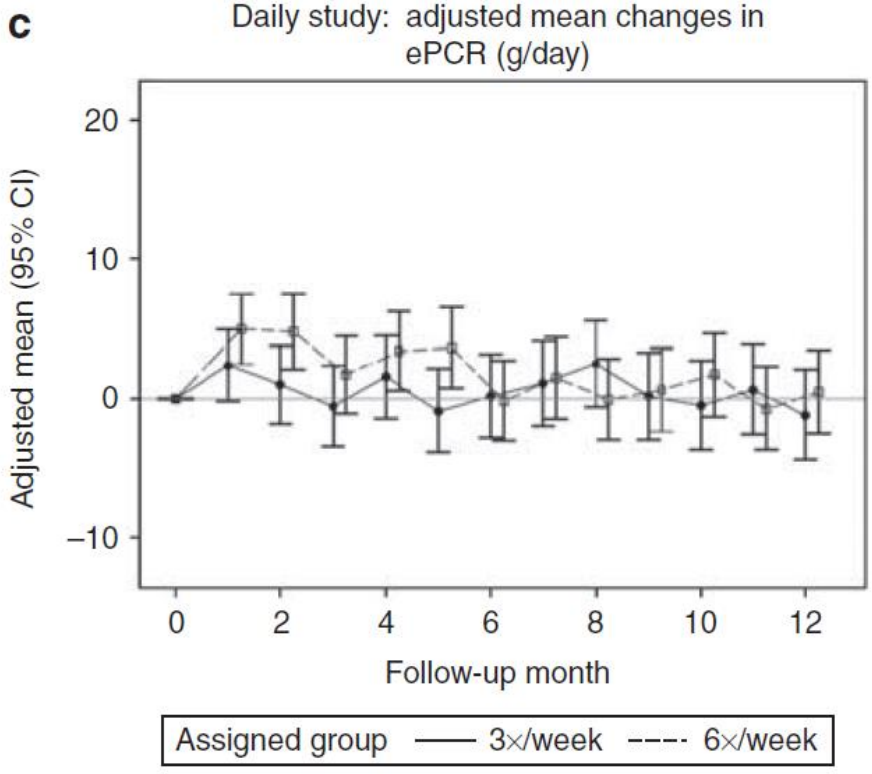


Galland KI 2001

Frequent Hemodialysis Network (FHN trial #1)
In-Center Daily Trial: Nutritional impact

RCT: 120 (standard) versus 125 (frequent short daily)





No effect on BW or BIA parameters

Kaysen KI 2012

Thrice Weekly Long (Nocturnal) (Home) Hemodialysis

The Long Dialysis Study

Prospective case-control study

In-Center 3x7-8h versus In-Center 3x3.5-4.5h hemodialysis therapy

2x247 patients with matching from 35 criteria

	Nocturnal HD (n = 227)[a]	Conventional HD (n = 242)[a]	P-value
Nutritional status			
Post-dialysis body weight (kg)	66.6 ± 14.4	65.2 ± 14.3	0.32
Albumin (g/dL)	4.02 ± 0.24	3.94 ± 0.29	0.001
Total cholesterol (mg/dL)	174 ± 41	165 ± 42	0.03
Triglyceride (mg/dL)	209 ± 136	184 ± 117	0.04
HDL cholesterol (mg/dL)	46 ± 11	43 ± 10	0.07
LDL cholesterol (mg/dL)	87 ± 29	85 ± 30	0.70
hs-CRP (mg/dL)	1.40 ± 1.37	1.67 ± 1.71	0.06
Bicarbonate (mEq/L)	23.8 ± 1.7	23.1 ± 1.8	<0.001

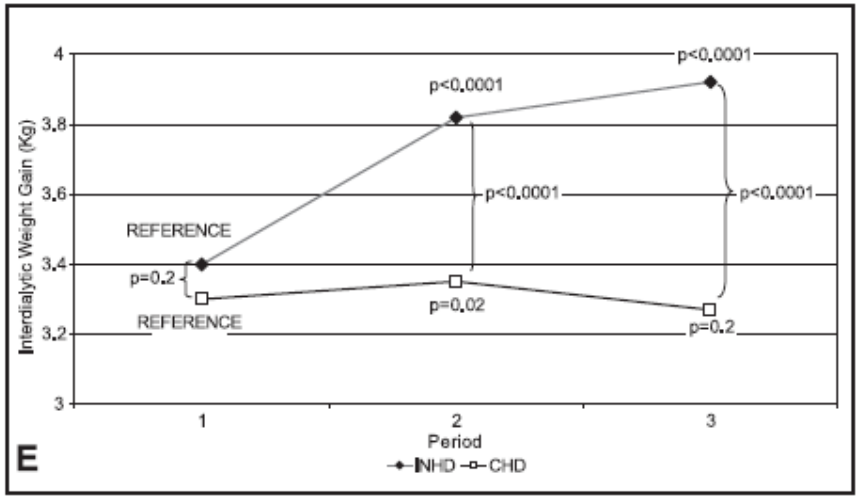
Ok NDT 2011

Switch from conventional to thrice-weekly In-Center nocturnal HD in FMC North-America

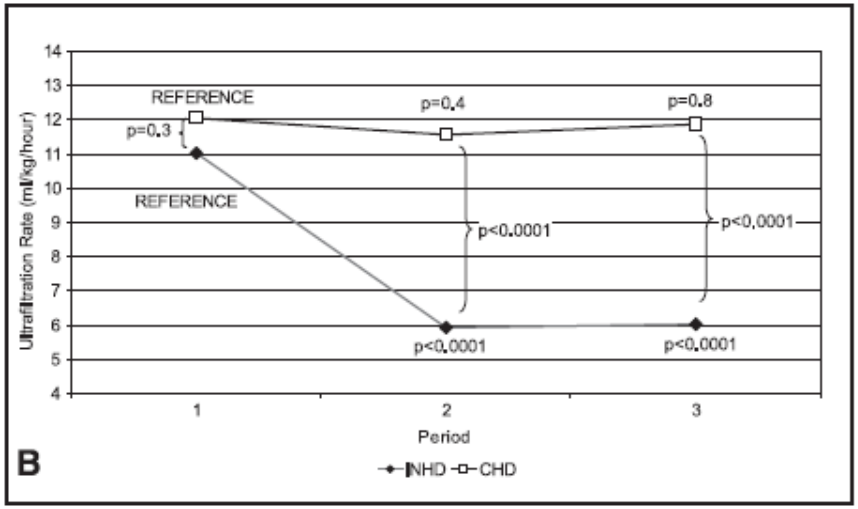
746 versus 2062 patients (471 vs 226 min)

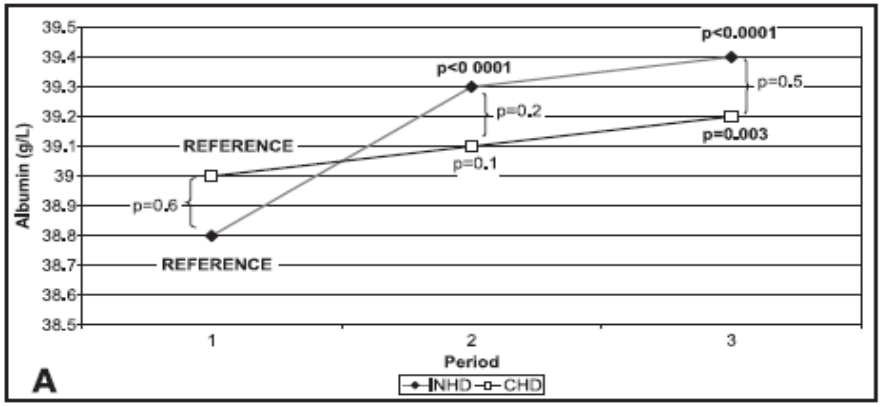
Propensity-score analysis

IDWG



UF rate



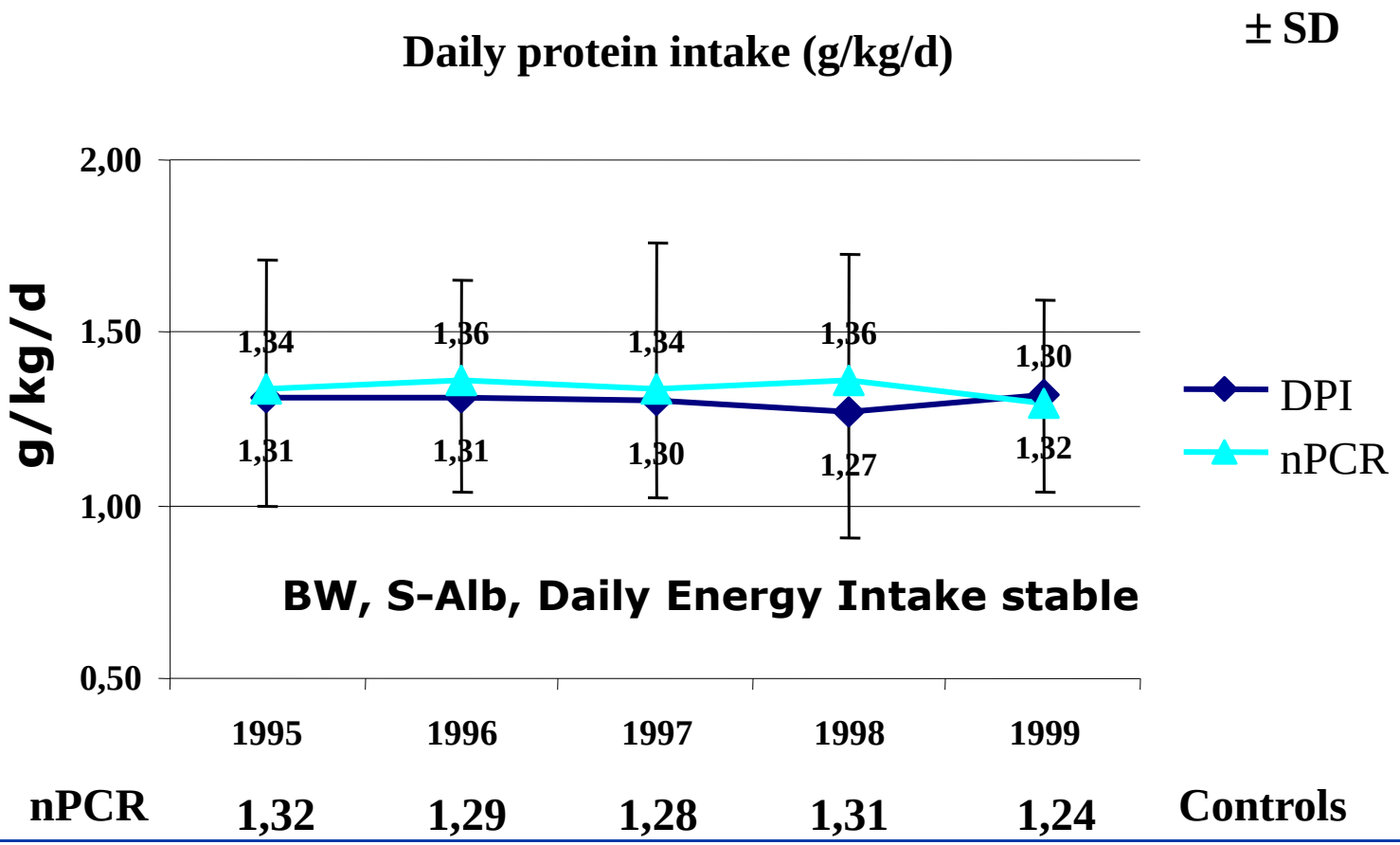


S-Alb

Lacson cJASN 2012

Nutritional stability with long-hour HD

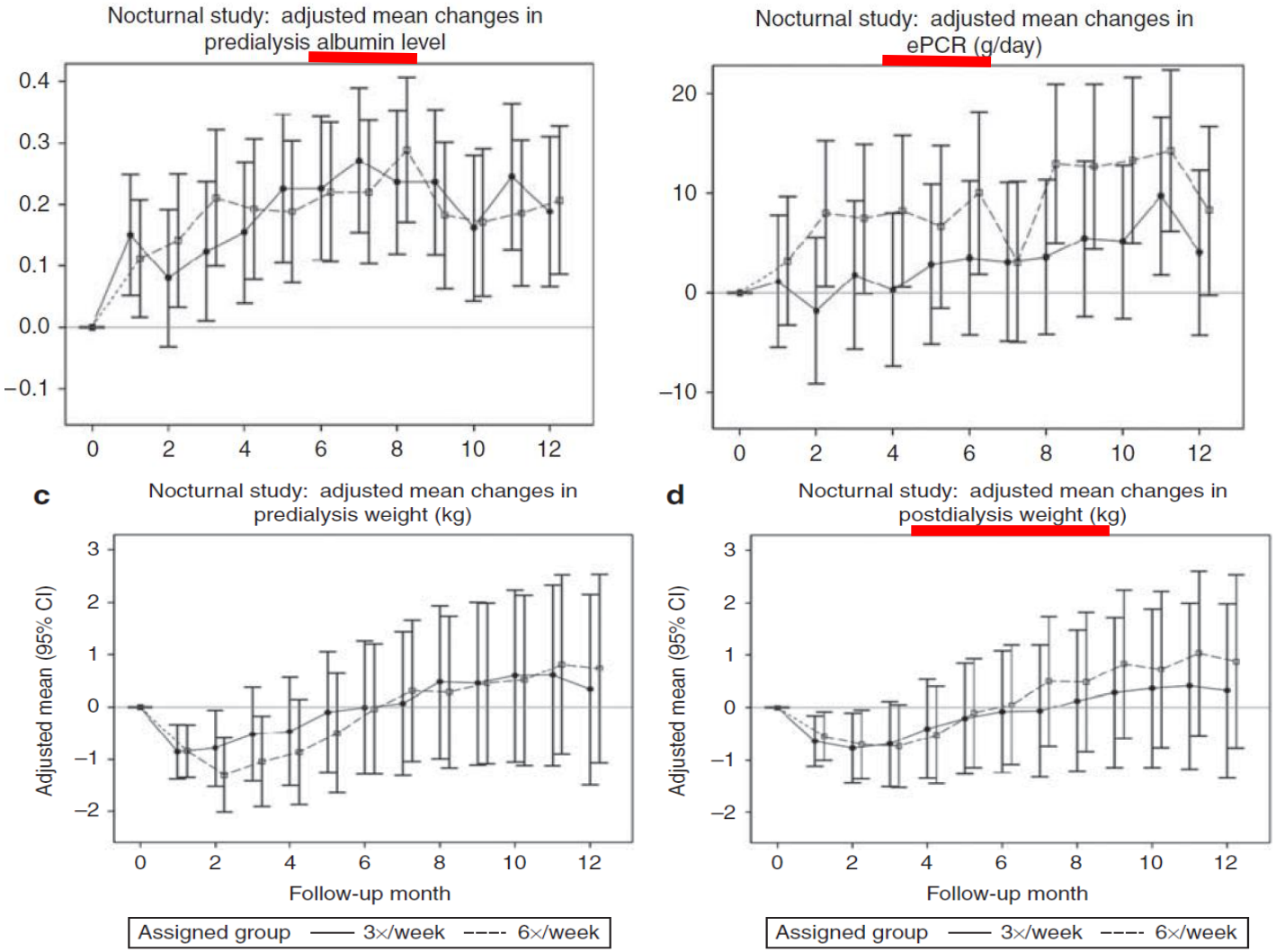
5-year follow-up of 53 patients treated with 3x 6-8 hours/week
33 have yearly dietary records - 20 are controls



Chazot HD Int 2006

Daily Nocturnal Home Hemodialysis
FHN trial #2

Frequent Hemodialysis Network
Daily Home Nocturnal Trial: Nutritional impact



RCT: 42 (standard) versus 45 (daily home nocturnal)

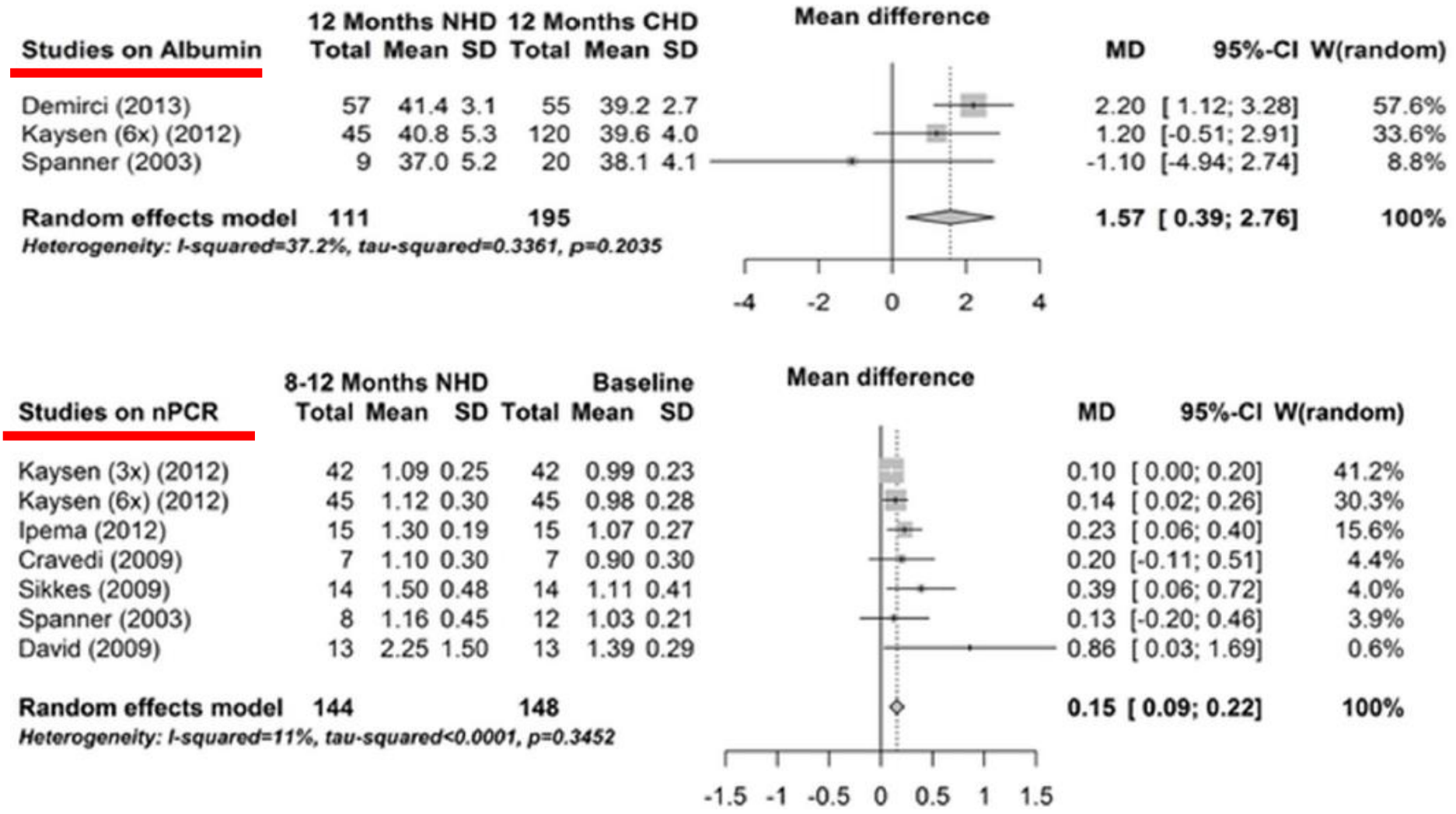
Kaysen KI 2012

Meta-Analysis on nutritional effect of nocturnal HD

Author	Duration of studies (months)	No. NHD patients	Men (n)	Mean age (years) mean±SD	In-centre /home NHD	Duration of NHD treatment	Study design	Single centre y/n	Control group y/n	Meta analysisy/n	Study quality
Alloatti,2002	>6	13	12 (92.3%)	52.0±13.0	In-centre	3 times/week for 8 hours	prospective	Y	N	N	4
Cravedi,2009	24	7	6 (85.7%)	50.4±11.0	In-centre	3 times/week for 8 hours	retrospective	Y	N	Y	5
David,2009	12	13	11 (84.6%)	34.8±13.7	In-centre	3 times/week for 8 hours	prospectivelongitudinal	Y	N	Y	5
Demirci,2013	12	57	41 (71.9%)	47.1±11.7	In-centre	3 times/week for 8 hours	prospective cohort trial	N	Y	Y	7
Ipema,2012	8	15	11 (73.3%)	53.4±10.3	Home	5/6 times/week for 8 hours	prospective observational	Y	N	Y	5
Kaysen,2012	12	87	57 (65.5%)		Home		prospective randomized trial	N	Y	Y	8
		42	28 (66.7%)	54.0±12.9		3 times/ week ≥ 2.5 hours					
		45	29 (64.4%)	51.7±14.4		6 times/ week ≥ 6 hours					
Maduel,2011	12	26	18 (69.2%)	49.2±14.0	In-centre		crossover prospective	Y	N	N	8
McPhatter,1999	18	11	5 (45.5%)	50.0±na	Home	5–6 times/week for 4–9 hours	prospectiveobservational	Y	N	N	5
O'Sullivan, 1998	2	5	3 (60%)	46,6±na	In-centre	6 times/week for 8 hours	pilot study	Y	N	N	3
Pierratos,1997	36	11	8 (72.7%)	40±10.0	Home	6–7 times/week for 8–10 hours	prospective	Y	N	Y	5
Schorr,2011	6	12	6 (50%)	54,2±13.0	Home	5–6 times/week for≥ 6 hours	randomized trial	Y	Y	Y	7
Sikkes,2009	12	14	13 (92.9%)	47.0±7.8	Home	6 times/week for 8 hours	prospective non-randomized	Y	N	Y	5
Spanner,2003	18	13	10 (76.9%)	44,2±6.4	Home	5–6 times/week for 6–8 hours	prospective controlled non-randomized	N	Y	Y	7

Ipema PlosOne 2016

Nutritional parameters



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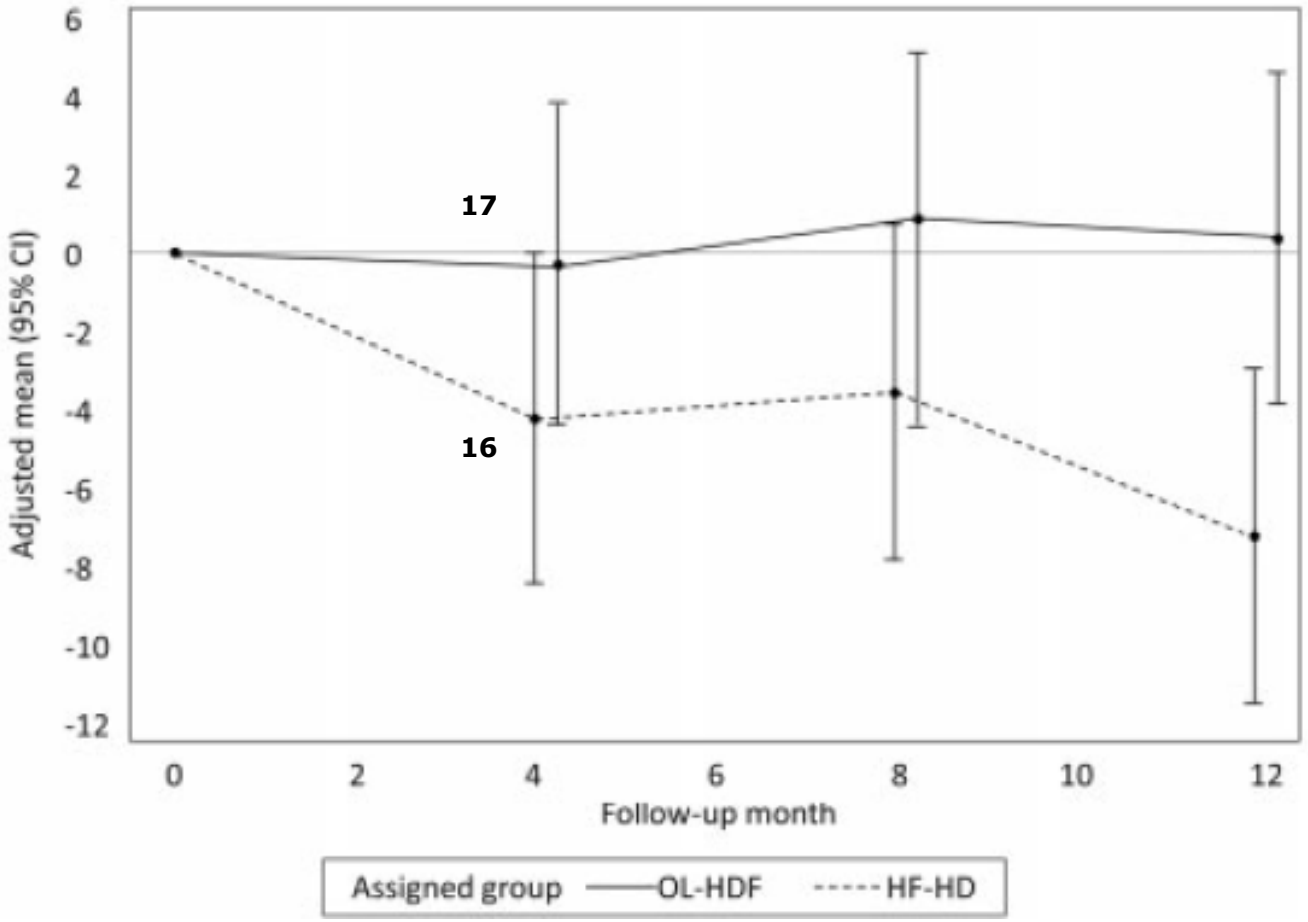
On the basis of improved toxin removal, a potential benefit of OL-HDF on nutritional status has been postulated [15–17]. However, evidence on the effect of OL-HDF on nutritional status is scarce and at times conflicting (18). Some observational and interventional studies have suggested that OL-HDF is associated with improved nutritional parameters [6, 7, 11, 19–22], while others have found no effect [23–29], and one study even reported negative effects of OL-HDF on nutritional status [30].

Switch from HF-HD to High Volume OL-HDF
Nutrition parameters at one year

Lean Tissue Mass



Molina NDT 2017

- Convective Therapies at Home?
- Not legally possible in France at the moment

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Nutritional supplement during the dialysis session

Non-randomized controlled study in 41 HD patients with albuminemia < 38g/L
Antioxydant & anti-inflammatory specific oral supplement,
830 Kcal + 33,5 g of protein at each dialysis for 4 weeks

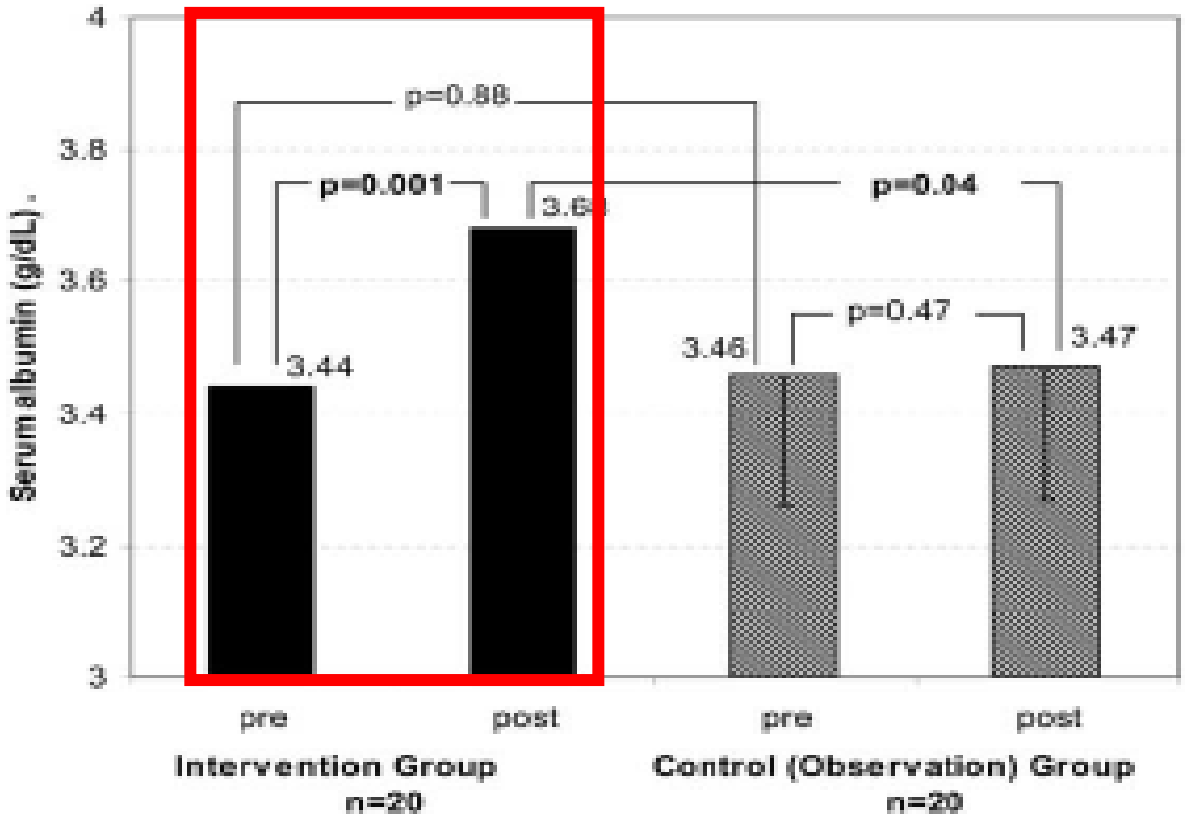
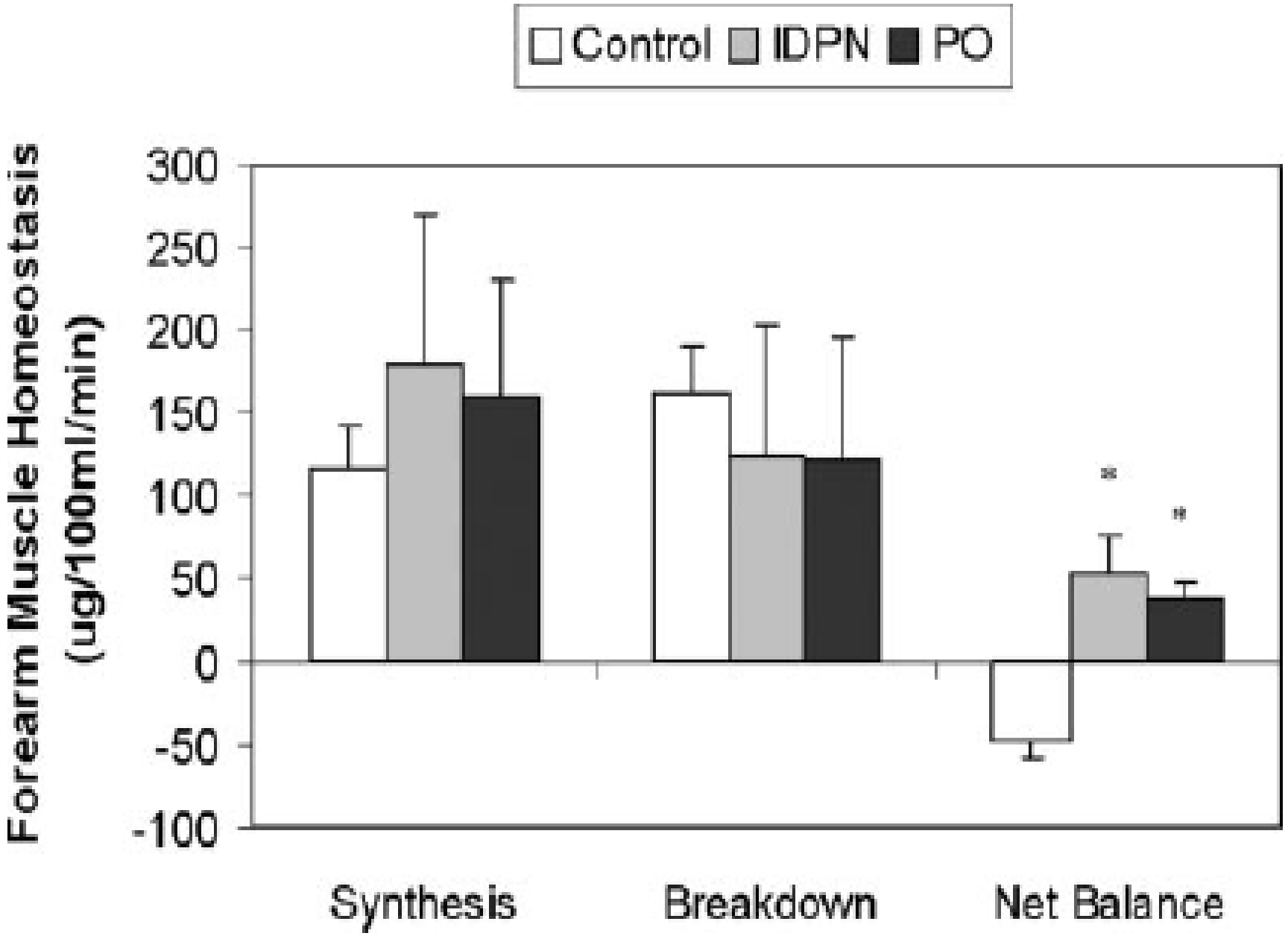


Figure 1. Serum albumin changes in both groups of hypoalbuminemic MHD patients.

Kalantar-Zadeh JRN 2005



Pupim JASN 2006

With permissions

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Take Home Message

- Never forget the basics: no good nutrition without good dialysis

  See the home-treated patients often…!!!

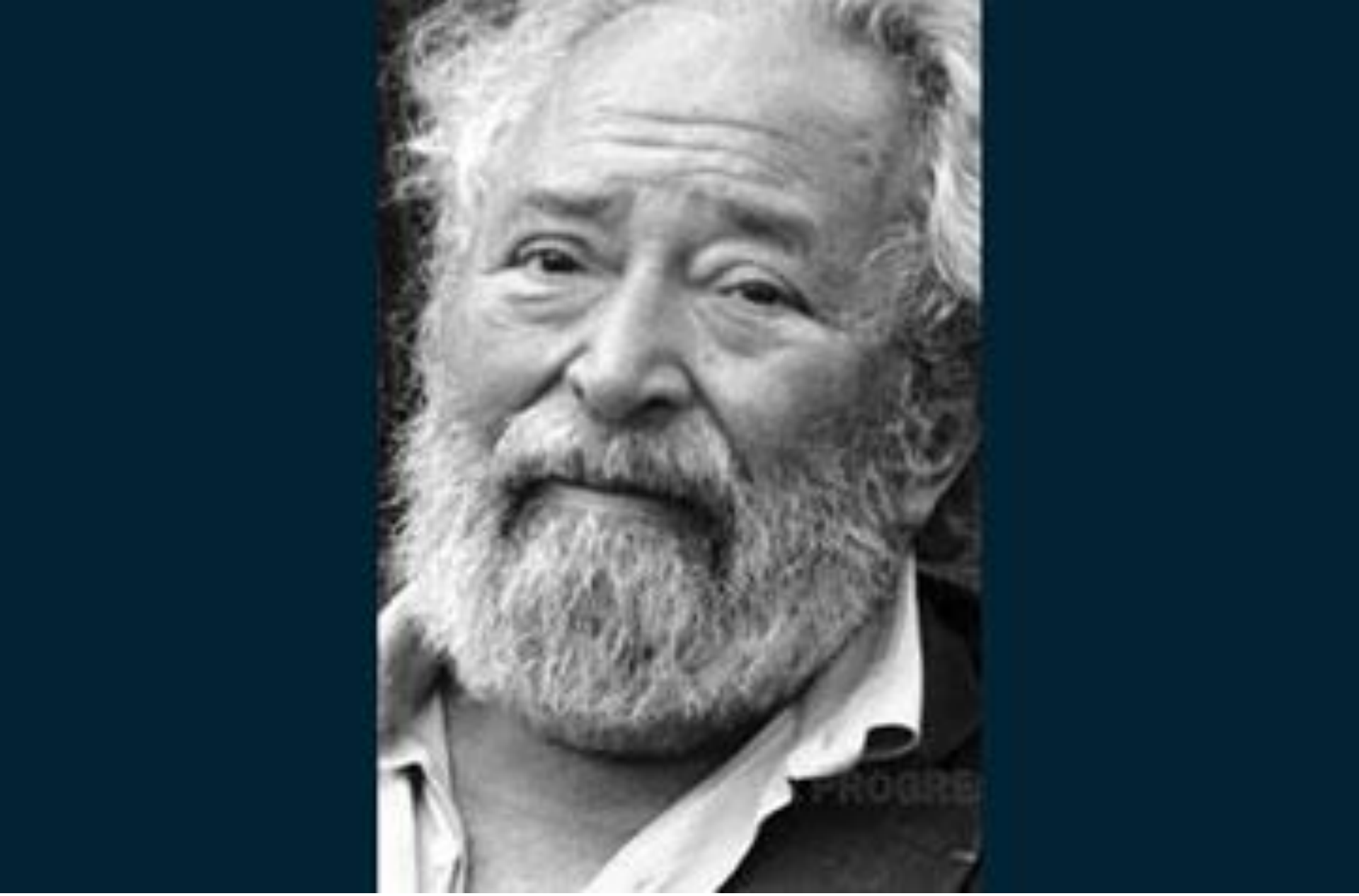
- Home PD or Home HD: no evidence for better nutritional status whatever the method

- Short daily in-center or home HD (FHN trial #1): no evidence for better nutritional status

- Nocturnal home HD: Some evidence for better nutritional status

- Convective therapies: controversial. More stable Lean Body mass to be confirmed

- Utmost importance for the patient to be fed during dialysis therapy, even at home?



This presentation is dedicated to Dr Guy Laurent, founder of the Tassin Dialysis Unit