



Benefits of Home Dialysis

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Objectives

- ☐ Highlight factors that must be considered when approaching patients for home dialysis
- ☐ Discuss clinical benefits of Home Hemodialysis
- ☐ Discuss non-clinical benefits of home dialysis
- ☐ Discuss the importance of education

Patient Selection-HHD

☐ **Potential candidates for home hemodialysis**

- ☐ Patients who are able to physically and cognitively manage the tasks of care (or have a support person who can)
- ☐ Patients who are motivated and willing to learn the technique
- ☐ Patients who wish to continue to work or continue schooling
- ☐ Patients who have failed peritoneal dialysis and wish to continue therapy at home

Patient Selection-HHD

☐ Potential candidates for home hemodialysis

- ☐ Patients with:
 - ☐ Severe sleep apnea
 - ☐ Persistent hyperphosphatemia
 - ☐ Right heart failure
 - ☐ Uncontrolled ascites

Patient Selection-HHD

☐ Potential candidates for home hemodialysis

- ☐ Refractory volume overload
- ☐ Difficult-to-control hypertension
- ☐ Symptomatic hypotension, cramps, or nausea on conventional HD
- ☐ Inadequate control of uremic symptoms on conventional HD
- ☐ Excessive recovery time after conventional HD
- ☐ Women who are pregnant or planning to conceive

Patient Selection-HHD

☐ **Contraindications to home hemodialysis**

- ☐ Unstable medical conditions (e.g., uncontrolled arrhythmia, seizure disorders)
- ☐ Lack of suitable vascular access
- ☐ Unstable behavioral problems (e.g., uncontrolled psychosis or anxiety, ongoing IV drug use, and alcohol abuse)
- ☐ Contraindication to anticoagulant use during dialysis
- ☐ Conditions that may cause abrupt loss of consciousness (e.g., severe and unstable intradialytic hypotension)

Method to Assess Treatment Choices for Home Dialysis (MATCH-D)

Suitability Criteria for *Self* Home Hemodialysis: Conventional, Daily, or Extended

Strongly Encourage Home HD

- ☐ Any patient who wants to do home HD or has no barriers to it
- ☐ Employed full- or part-time
- ☐ Drives a car – skill set is very similar to learning home HD
- ☐ Caregiver for a child, elder, or person with disability
- ☐ Lives far from clinic and/or has unreliable transportation
- ☐ Student: grade school to grad school
- ☐ Needs/wants to travel for work or enjoyment
- ☐ Wants a flexible schedule for any reason
- ☐ Has rejected a transplant
- ☐ Has neuropathy, amyloidosis, LVH, uncontrollable BP†‡
- ☐ Obese/large; conventional HD or PD are not adequate †‡
- ☐ Can't/won't follow in-center HD diet & fluid limits†‡
- ☐ Is pregnant or wants to be †‡
- ☐ Frail/elderly with involved, caring helper who wants home HD*
- ☐ Wants control; unhappy in-center
- ☐ No longer able to do PD

Encourage Home HD After Assessing and Eliminating Barriers

- ☐ No employer insurance – not a barrier to nocturnal 3x/wk home HD, which Medicare & Medicaid cover
- ☐ Unkempt – provide hygiene education; assess results
- ☐ Has pet(s)/houseplants (carry bacteria) – bar from room at least while cannulating/connecting access
- ☐ Frail or can't walk/stand – assess lifting ability, offer PT*
- ☐ Illiterate – use pictures to train, return demonstrations to verify learning, tape recorders for patient reports
- ☐ Hearing impaired – use light/vibration for alarms
- ☐ Depressed, angry, or disruptive – increased control with home HD may help
- ☐ No helper & clinic requires one – reconsider policy, monitor remotely, use LifeLine device to call for help
- ☐ Rents – check with landlord if home changes needed
- ☐ Can't/won't self-cannulate – use patient mentor, practice arm, local anesthetic cream, desensitization*
- ☐ No running water, poor water quality, low water pressure – assess machine & water treatment options
- ☐ Limited space for supplies – visit home, 2x/mo. delivery, consider machine with fewer supply needs
- ☐ Drug or alcohol abuse – consider after rehab
- ☐ Bedridden and/or has tracheostomy/ventilator – assess self-care and helper ability*
- ☐ Rx drugs impair function – consider drug change

May Not Be Able to Do Home HD (or Helper Must Do More)

- ☐ Homeless; consider PD if storage is available
- ☐ Can't maintain personal hygiene
- ☐ Home is health hazard, will not correct
- ☐ Unreliable or no electricity
- ☐ Brain damage, dementia, or poor short-term memory*
- ☐ No use of either hand*
- ☐ Uncontrolled psychosis or anxiety*
- ☐ Blind or severely visually impaired – consider PD*
- ☐ Uncontrolled seizure disorder*
- ☐ No remaining HD access sites – consider PD
- ☐ Reduced awareness/ability to report bodily symptoms
- ☐ Has living donor, transplant is imminent – consider PD



Check all the boxes that apply. Keep a copy of the MATCH-D in the patient's record.

* May be able to do with a helper
† Consider extended home HD
‡ Consider daily home HD

Factors Patients Consider When Choosing Modalities

Modality	Advantages	Disadvantages
In-center HD	<ul style="list-style-type: none"> • Feels secure (supervision by known professionals) • Freedom from illness at home and on dialysis free days • Socializing with staff and other patients 	<ul style="list-style-type: none"> • Transport time to clinic • Fixed dialysis time and no flexibility • Limitations on holidays or family time
Home HD	<ul style="list-style-type: none"> • Greater flexibility • No travel time to a facility • Better social life • Possibility of continuing a career • Possibility of night-time treatment 	<ul style="list-style-type: none"> • Takes up space in the home and is unsightly • Technical problems and noise • Difficult to take equipment on holidays
PD (all forms)	<ul style="list-style-type: none"> • Greater flexibility • No travel time to a facility • Better social life • Possibility of continuing a career • Possibility of night-time treatment • Good for those who fear needles 	<ul style="list-style-type: none"> • PD bags are heavy • Takes up space in the home and is unsightly • Technical problems and noise

Data derived from six focus groups involving 27 patients and 18 relatives

Historical Perspective

The authors concluded that home dialysis was a “safe and practical way” of performing hemodialysis, with “long term feasibility” established with the program lasting more than a year. This was one of the earliest studies published on home hemodialysis.

[Annals of Internal Medicine](#) in 1966
[Hampers and Merrill](#) from Boston, MA

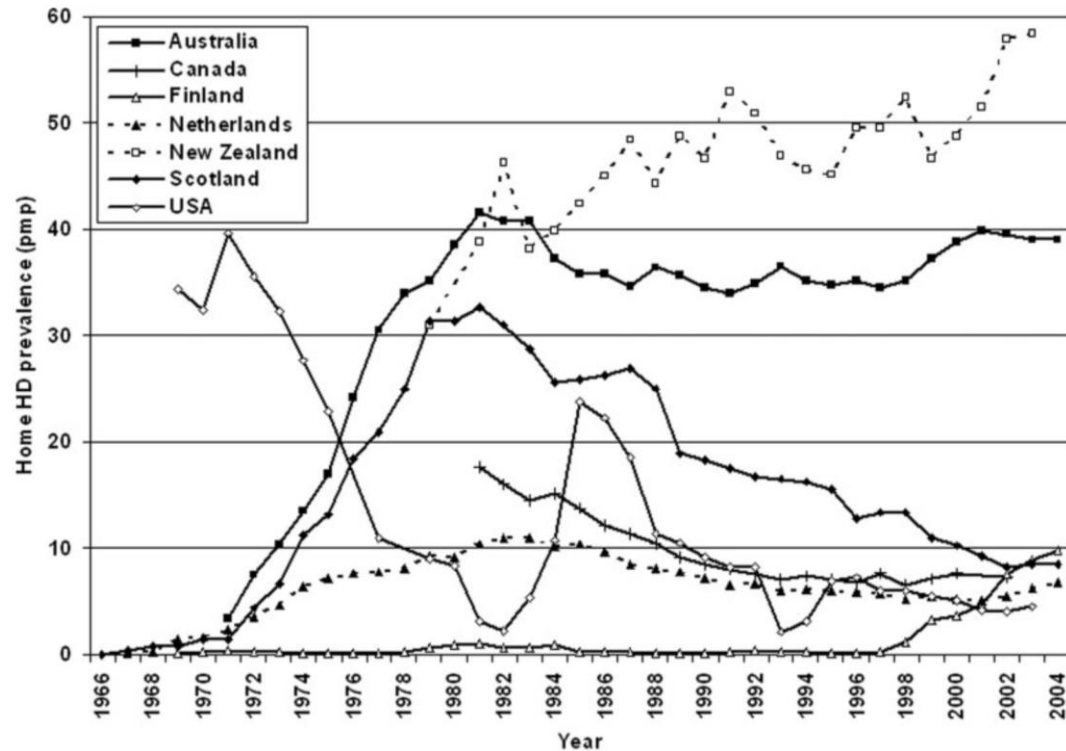


A picture from the [Hampers and Merrill](#) study:

Patient having dialysis at home with 5-year-old son looking on.

Home Hemodialysis Trends

Home HD—international trends and variation



The prevalence of home HD in seven countries
MacGregor, M et. Al., NDT 2006

TABLE 1. % DIALYSIS PATIENTS RECEIVING HOME HEMODIALYSIS, BY COUNTRY (2013)

Rank	Country	Percentage
1	New Zealand	18.4
2	Australia	9.3
3	Denmark	5.9
4	Finland	5.7
5	Canada	4.3
6	United Kingdom	4.2
7	Sweden	3.7
8	Netherlands	3.3
9	Hong Kong	2.6
10	Scotland	2.6
11	Ireland	2.4
12	Belgium, Dutch sp.	2.2
13	United States	1.8

Source: USRDS, 2015 Annual Data Report.

Home Hemodialysis Trends

Table 1. Largest dialysis providers in 2019

Dialysis Provider	Number of patients	In-Center Conventional HD	Home HD	PD	Units	Patient growth 5/19 (vs. 5/18)
1. Fresenius Medical Care North America	208,007	183,406	4,686	19,915	2,671	6,827 (8,216)
2. DaVita Kidney Care	204,000	177,900	3,200	22,900	2,705	5,000 (8,500)
3. U.S. Renal Care	25,327	22,467	202	2,658	334	510 (-303)
4. American Renal Associates	17,018	15,437	150	1,431	243	1,242 (1,041)
5. Dialysis Clinic Inc.	14,969	13,085	209	1,675	261	11 (-41)
6. Satellite Healthcare	8,209	6,557	232	1,420	79	255 (347)
7. Atlantic Dialysis Management	2,309	2,252	5	52	13	26 (67)
8. Northwest Kidney Centers	1,822	1,579	43	200	18	57 (50)
9. Rogosin Institute	1,675	1,473	65	137	10	206 (n/c)
10. Centers for Dialysis Care	1,526	1,502	15	9	15	-42 (66)
2019 Totals	484,862	425,658	8,807	50,397	6,347	
2018 Totals	470,786	416,504	7,808	46,474	6,030	

Source: *Nephrology News & Issues*

ME. Neumann, Large providers continue strong growth in home dialysis
Nephrology News & Issues, August 2019

End-Stage Renal Disease (ESRD) Treatment Choices (ETC) Model



Executive Order on Advancing American Kidney Health

10 July 2019

[whitehouse.gov/presidential-actions/executive-order-advancing-american-kidney-health](https://www.whitehouse.gov/presidential-actions/executive-order-advancing-american-kidney-health)

Designed by: Tejas Desai, MD | @nephondemand



Goals

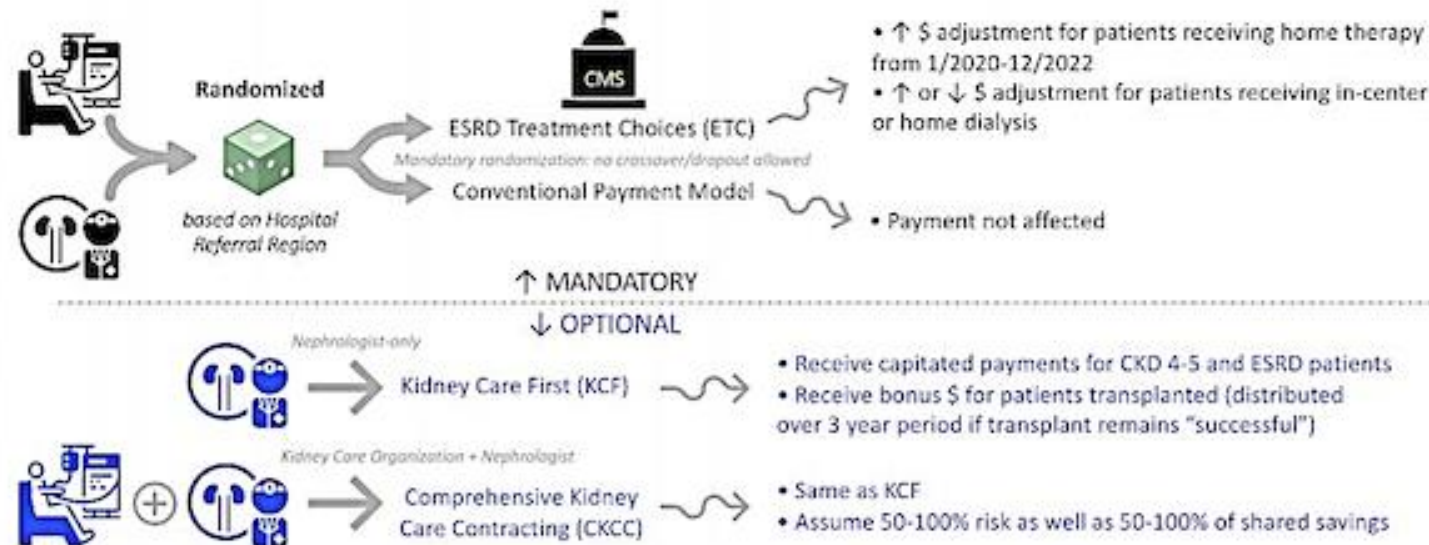


- 80% of incident ESRD patients receive either home dialysis therapy or transplantation by CY 2025
- Standardize organ procurement reduce percentage of discarded organs
- Remove financial barriers for living kidney donors
- Encourage development of the artificial kidney
- Restructure payment models to incentivize prevention, home therapy/transplantation

Payment Models



ETC | KCF
CKCC Graduated
CKCC Pro/Global



Rationale for Choosing Home HD as First Choice for Home Dialysis Therapy

- Better outcomes than in-center 3x per week HD:
 - May confer a survival advantage
 - Improved QoL, blood pressure, and phosphate control
 - Reduced risk of infectious complications
 - Reduction in dialysis related side-effects
- Convenience and flexibility for patient
- Less dietary and fluid restrictions for patients using frequent dialysis
- Reduction in Cost

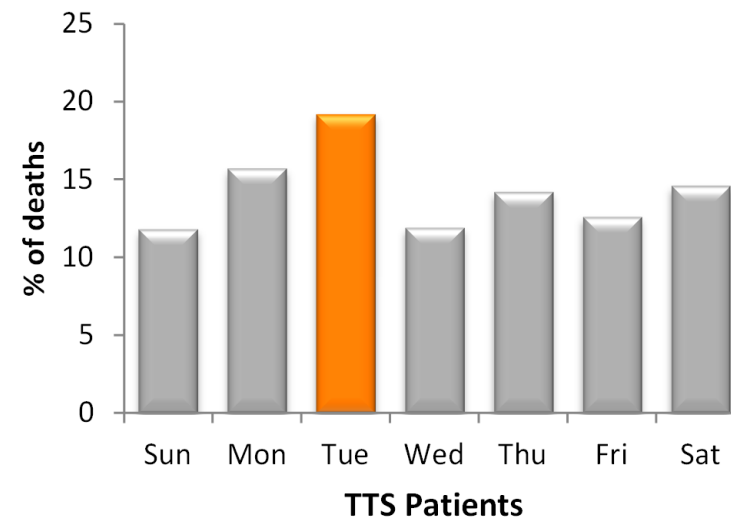
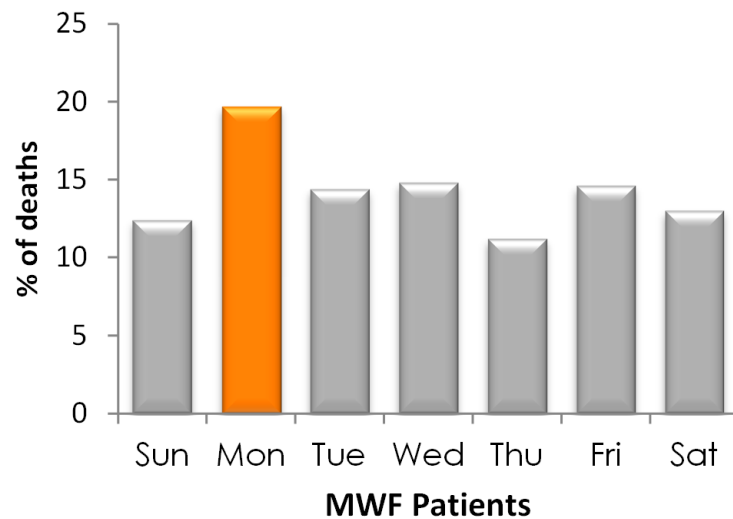
Kjellstrand CM, et al. *Nephrol Dial Transplant*. 2008;23(10):3283-3289. ²Marshall MR, et al. *Am J Kidney Dis*. 2011;58(5):782-793.

Chertow GMG, et al. *N Engl J Med*. 2010;363(24):2287-2300. ⁴Rocco M V, et al. *Kidney Int*. 2011;80(10):1080-1091.

Masterson R. *Hemodial Int*. 2008;12 Suppl 1:S16-S20. ⁶Thodis ED, Oreopoulos DG. *J Nephrol*. 2011;24(4):398-404.

Higher Mortality During Treatment Gaps

- Deaths are increased on Mondays and Tuesdays in conventional HD, especially cardiac-related deaths



Distribution of deaths by day of the week for patients receiving dialysis on Monday–Wednesday–Friday (MWF) and Tuesday–Thursday–Saturday (TTS)³

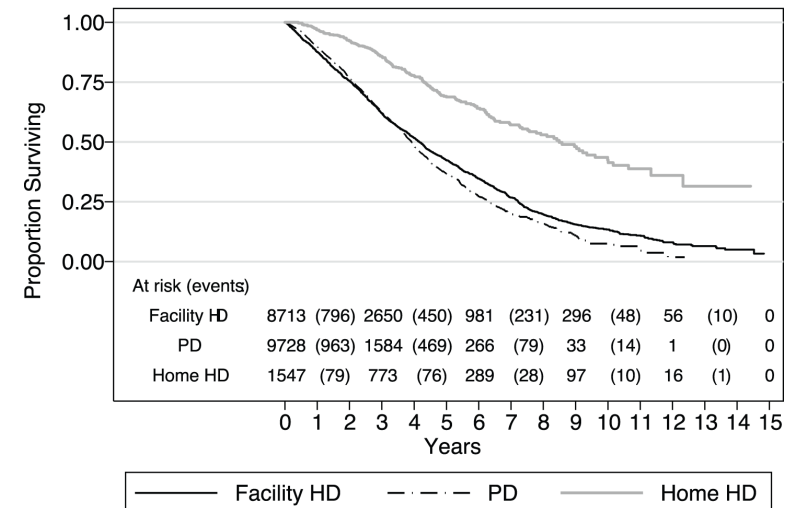
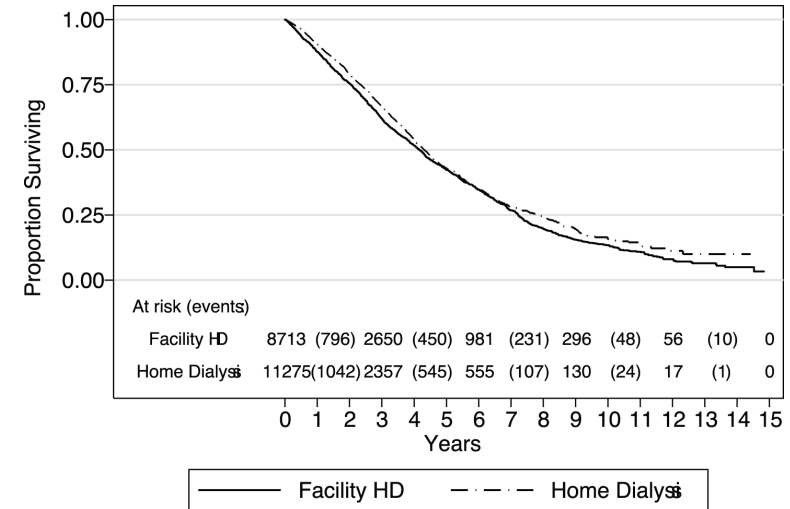
[Bleyer AJ, et al. *Kidney Int.* 1999;55\(4\):1553-1559](#)

[Foley RN, et al. *N Engl J Med.* 2011;365\(12\):1099-1107](#)

[Zhang H, et al. *Kidney Int.* 2012;81\(11\):1108-1115](#)

Improved Survival with Home HD

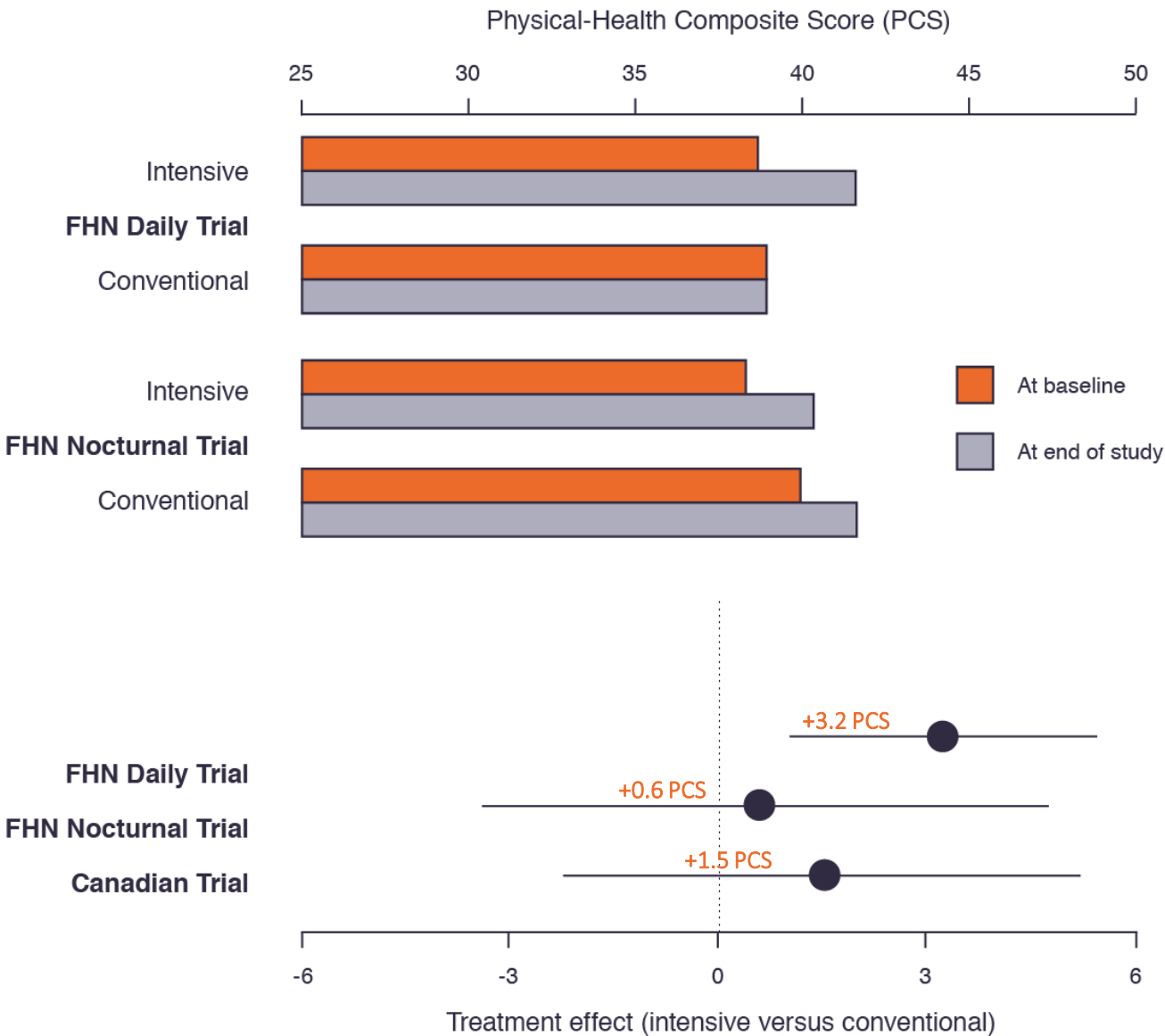
- Home dialysis (peritoneal and HD) has similar survival outcomes to in-center HD (top).
- Home HD has significantly better survival compared to in-center HD and PD (bottom).
- Mortality risk compared to in-center HD:
 - 53% lower risk with Home HD
 - 20% lower risk with PD <3 years
 - 33% higher risk with PD >3 years



Intensive hemodialysis improved physical health-related quality of life

- Effects of intensive versus conventional hemodialysis on the physical-health composite score in the FHN Daily Trial, the FHN Nocturnal Trial, and the Canadian trial of nocturnal hemodialysis.
- Estimated treatment effects (solid dots) and associated 95% confidence intervals (solid lines) are displayed at the bottom.*

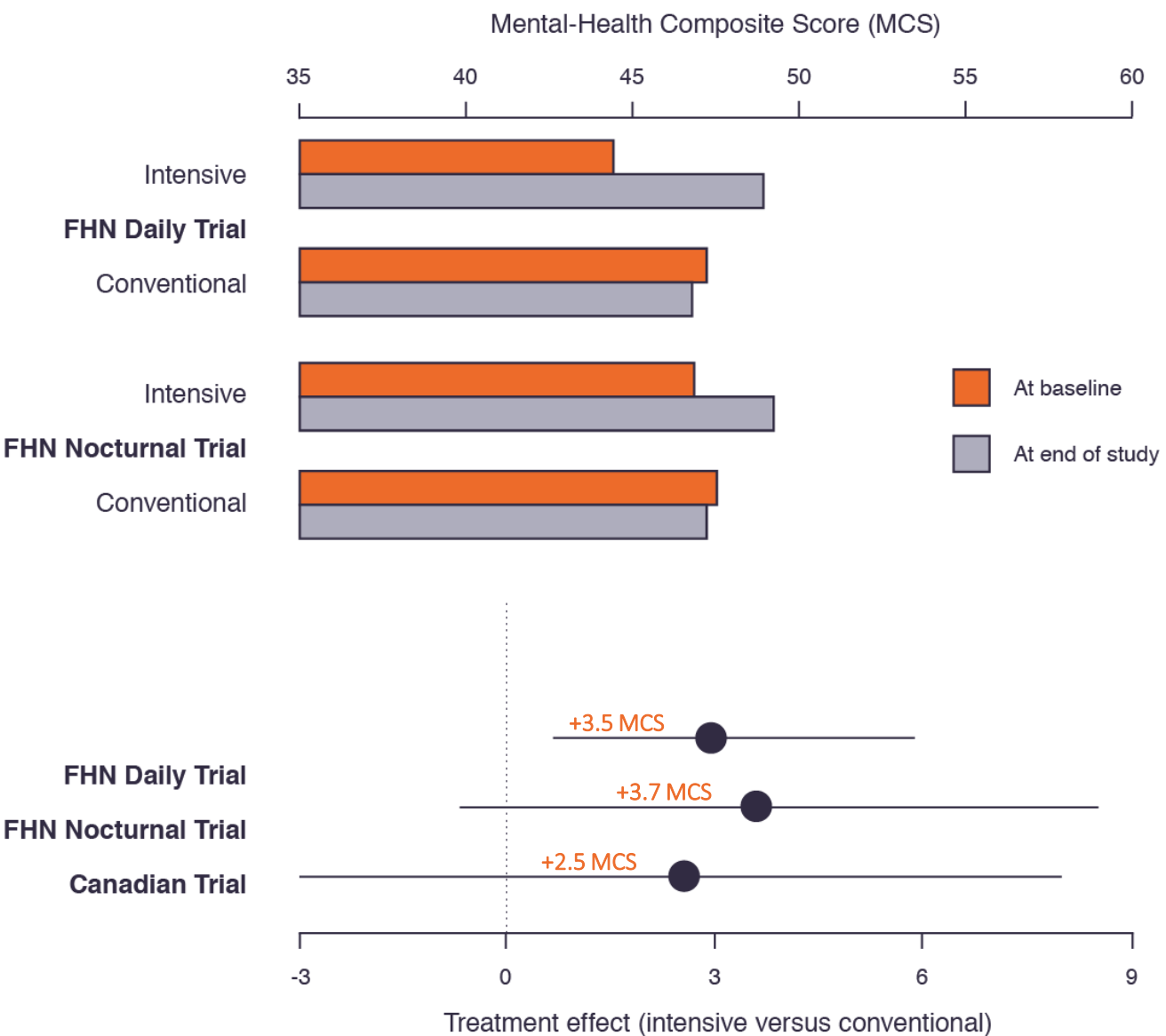
FHN Trial Group, Chertow GM, Levin NW, et al. In-center hemodialysis six times per week versus three times per week. *N Engl J Med.* 2010;363(24):2287-2300. doi:10.1056/NEJMoa1001593. ²Rocco MV, Lockridge RS, Beck GJ, et al. The effects of frequent nocturnal home hemodialysis: the Frequent Hemodialysis Network Nocturnal Trial. *Kidney Int.* 2011;80(10):1080-1091. doi:10.1038/ki.2011.213. ³Manns BJ, Walsh MW, Culleton BF, et al. Nocturnal hemodialysis does not improve overall measures of quality of life compared to conventional hemodialysis. *Kidney Int.* 2009;75(5):542-549. doi:10.1038/ki.2008.639.



Intensive hemodialysis also improved mental health-related quality of life

- Effects of intensive versus conventional hemodialysis on the physical-health composite score in the FHN Daily Trial, the FHN Nocturnal Trial, and the Canadian trial of nocturnal hemodialysis.
- *Estimated treatment effects (solid dots) and associated 95% confidence intervals (solid lines) are displayed at the bottom.*

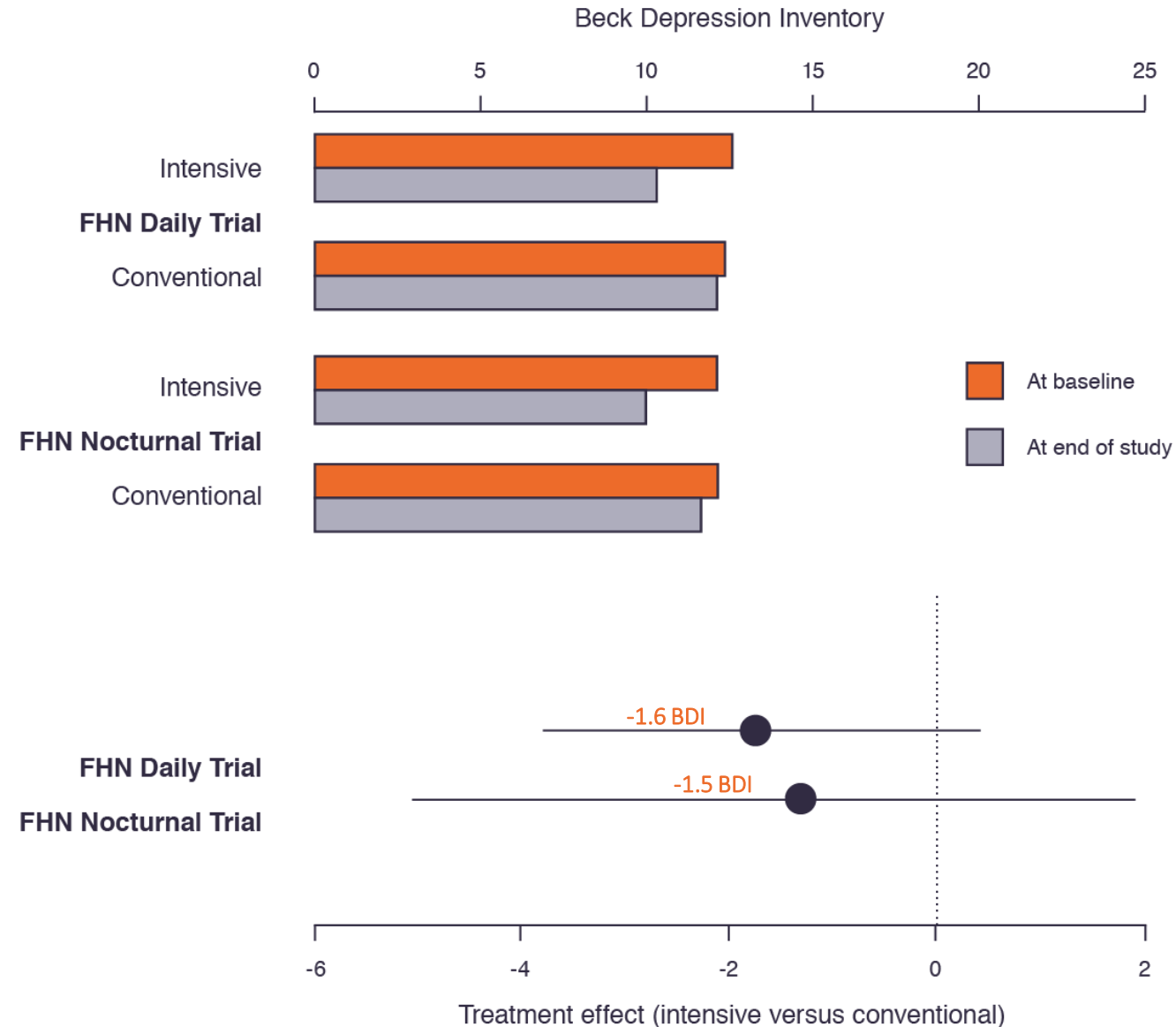
Unruh ML, Larive B, Chertow GM, et al. Effects of 6-times-weekly versus 3-times-weekly hemodialysis on depressive symptoms and self-reported mental health: Frequent Hemodialysis Network (FHN) Trials. Am J Kidney Dis Off J Natl Kidney Found. 2013;61(5):748-758. doi:10.1053/j.ajkd.2012.11.047. ²Manns BJ, Walsh MW, Culleton BF, et al. Nocturnal hemodialysis does not improve overall measures of quality of life compared to conventional hemodialysis. Kidney Int. 2009;75(5):542-549. doi:10.1038/ki.2008.639.



In the FHN trials, intensive hemodialysis decreased Beck Depression Inventory scores more so than conventional hemodialysis

- Effects of intensive versus conventional hemodialysis on the Beck Depression Inventory score in the FHN Daily Trial and the FHN Nocturnal Trial
- *Estimated treatment effects (solid dots) and associated 95% confidence intervals (solid lines) are displayed at the bottom.*

FHN Trial Group, Chertow GM, Levin NW, et al. In-center hemodialysis six times per week versus three times per week. *N Engl J Med*. 2010;363(24):2287-2300. doi:10.1056/NEJMoa1001593. ²Rocco MV, Lockridge RS, Beck GJ, et al. The effects of frequent nocturnal home hemodialysis: the Frequent Hemodialysis Network Nocturnal Trial. *Kidney Int*. 2011;80(10):1080-1091. doi:10.1038/ki.2011.213.



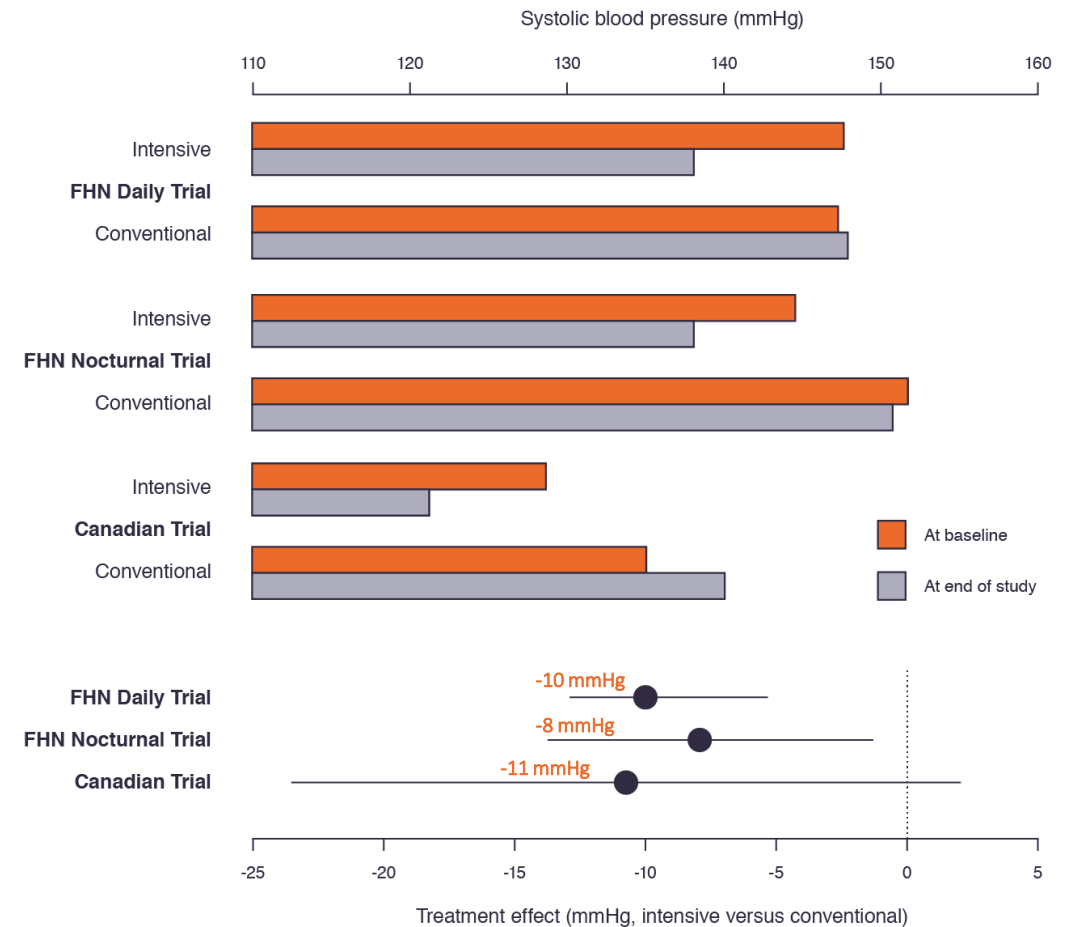
Multiple randomized clinical trials show intensive hemodialysis significantly lowers blood pressure

Effects of intensive versus conventional hemodialysis on pre-dialysis systolic blood pressure in the FHN Daily Trial,¹ the FHN Nocturnal Trial,² and the Canadian trial of nocturnal hemodialysis.³

Estimated treatment effects (solid dots) and associated 95% confidence intervals (solid lines) are displayed at the bottom.

FHN Trial Group, Chertow GM, Levin NW, et al. In-center hemodialysis six times per week versus three times per week. *N Engl J Med.* 2010;363(24):2287-2300. doi:10.1056/NEJMoa1001593. ²Rocco MV, Lockridge RS, Beck GJ, et al. The effects of frequent nocturnal home hemodialysis: the Frequent Hemodialysis Network Nocturnal Trial. *Kidney Int.* 2011;80(10):1080-1091. doi:10.1038/ki.2011.213. ³Culleton BF, Walsh M, Klarenbach SW, et al. Effect of frequent nocturnal hemodialysis vs conventional hemodialysis on left ventricular mass and quality of life: a randomized controlled trial. *JAMA.* 2007;298(11):1291-1299. doi:10.1001/jama.298.11.1291.

⁴Bakris, G.L., Burkart, J.M., Weinhandl, E.D., McCullough, P.A., Kraus, M.A. Intensive hemodialysis, blood pressure, and antihypertensive medication use. *Am J Kidney Dis.* 2016;68:S15–S23.



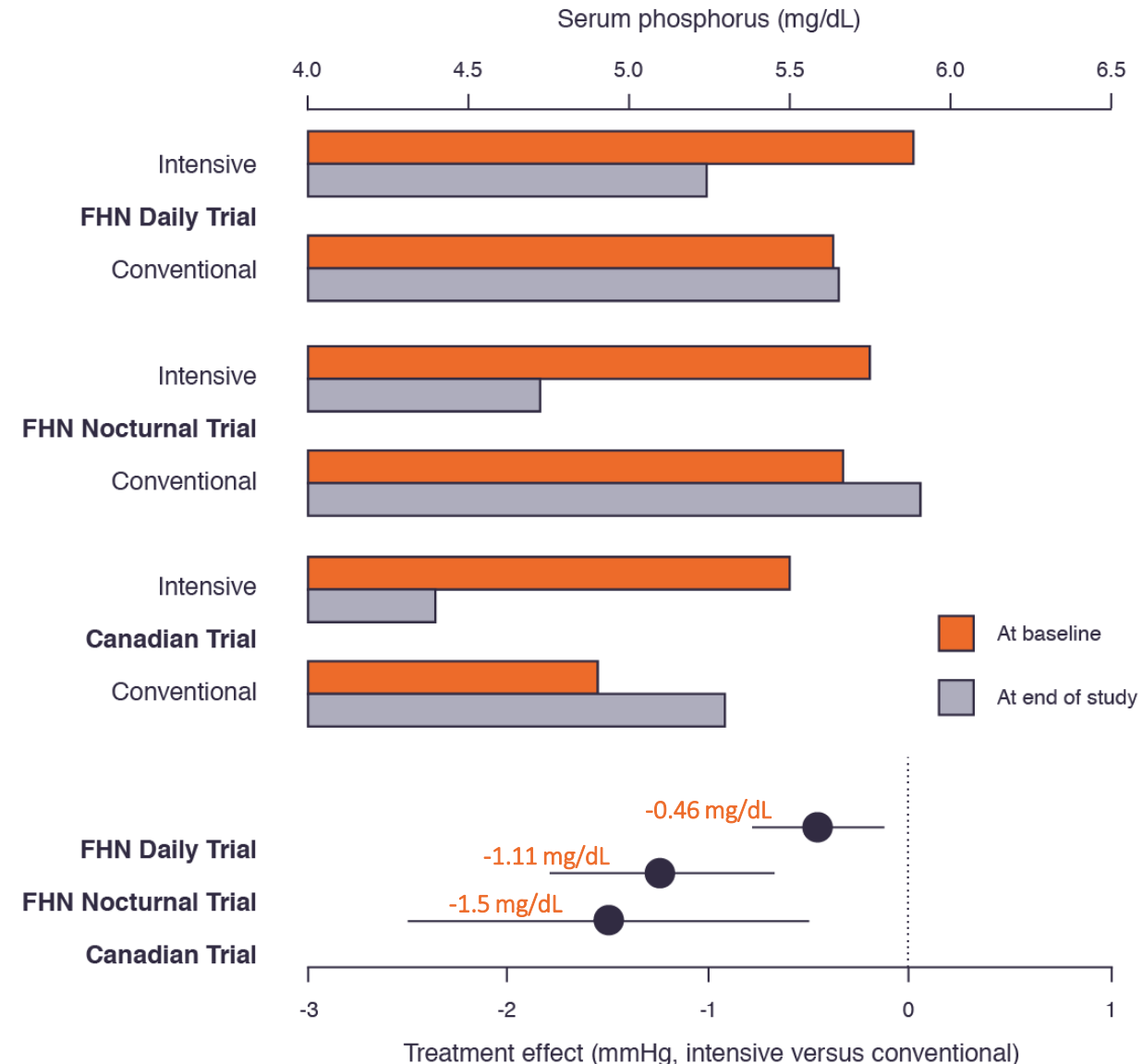
The FHN Daily, Nocturnal and a Canadian trial of nocturnal hemodialysis reported reductions in mean serum phosphorus from baseline to follow-up

In the conventional hemodialysis group, serum phosphorus increased over time.

Effects of intensive versus conventional hemodialysis on serum phosphorus in the FHN Daily Trial, the FHN Nocturnal Trial, and the Canadian trial of nocturnal hemodialysis.

Estimated treatment effects (solid dots) and associated 95% confidence intervals (solid lines) are displayed at the bottom.

Daugirdas JT, Chertow GM, Larive B, et al. Effects of frequent hemodialysis on measures of CKD mineral and bone disorder. J Am Soc Nephrol JASN. 2012;23(4):727-738. doi:10.1681/ASN.2011070688. ²Culleton BF, Walsh M, Klarenbach SW, et al. Effect of frequent nocturnal hemodialysis vs conventional hemodialysis on left ventricular mass and quality of life: a randomized controlled trial. JAMA. 2007;298(11):1291-1299. doi:10.1001/jama.298.11.1291.

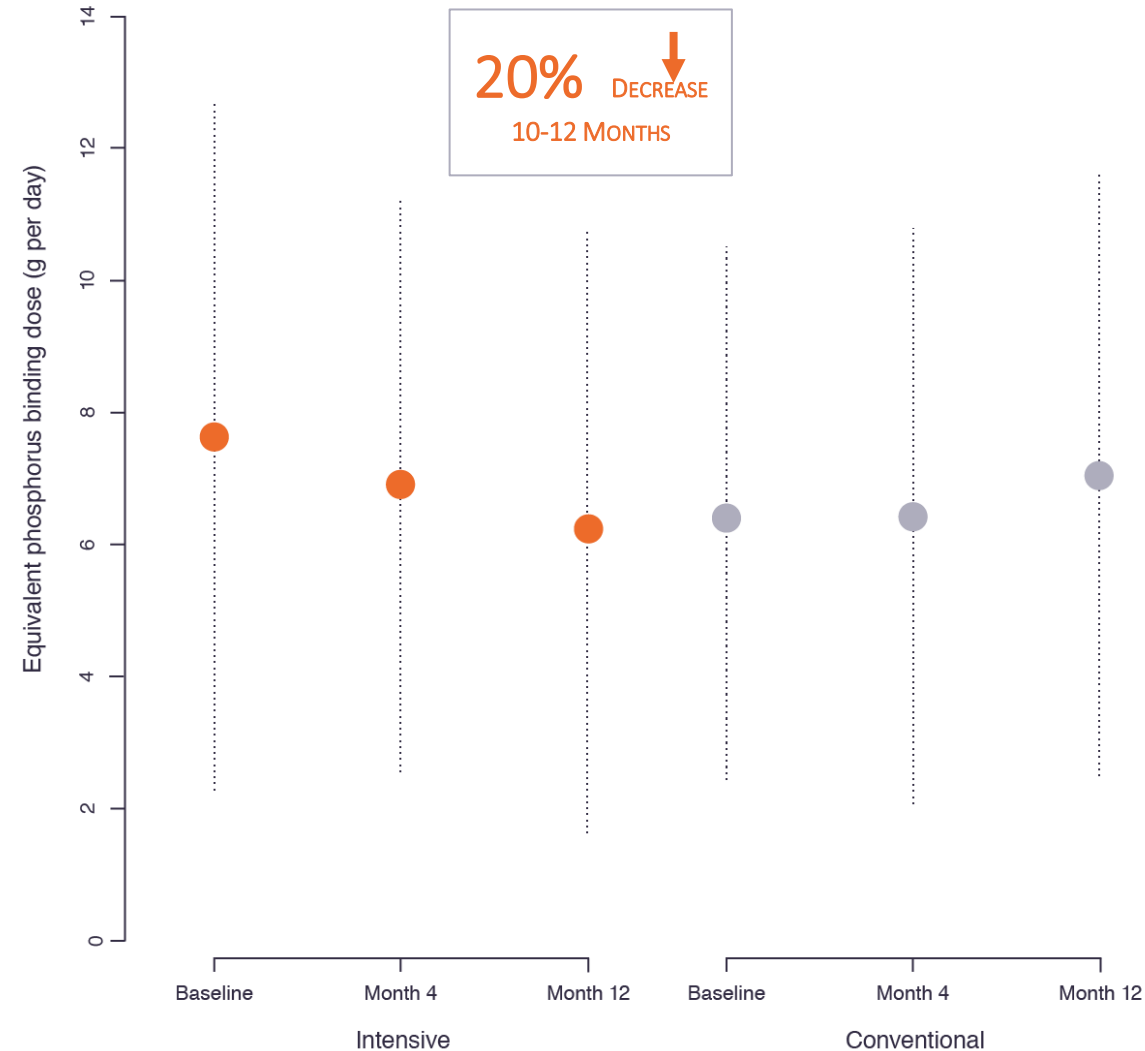


In the FHN Daily Trial, mean estimated pill burden per day declined from 7.17 pills per day at baseline to 5.70 after 10 to 12 months

Mean equivalent phosphorus binding dose for intensive versus conventional hemodialysis in the FHN Daily Trial.

Dashed bars span one standard deviation above and below the mean.

Daugirdas JT, Chertow GM, Larive B, et al. Effects of frequent hemodialysis on measures of CKD mineral and bone disorder. J Am Soc Nephrol JASN. 2012;23(4):727-738. doi:10.1681/ASN.2011070688.

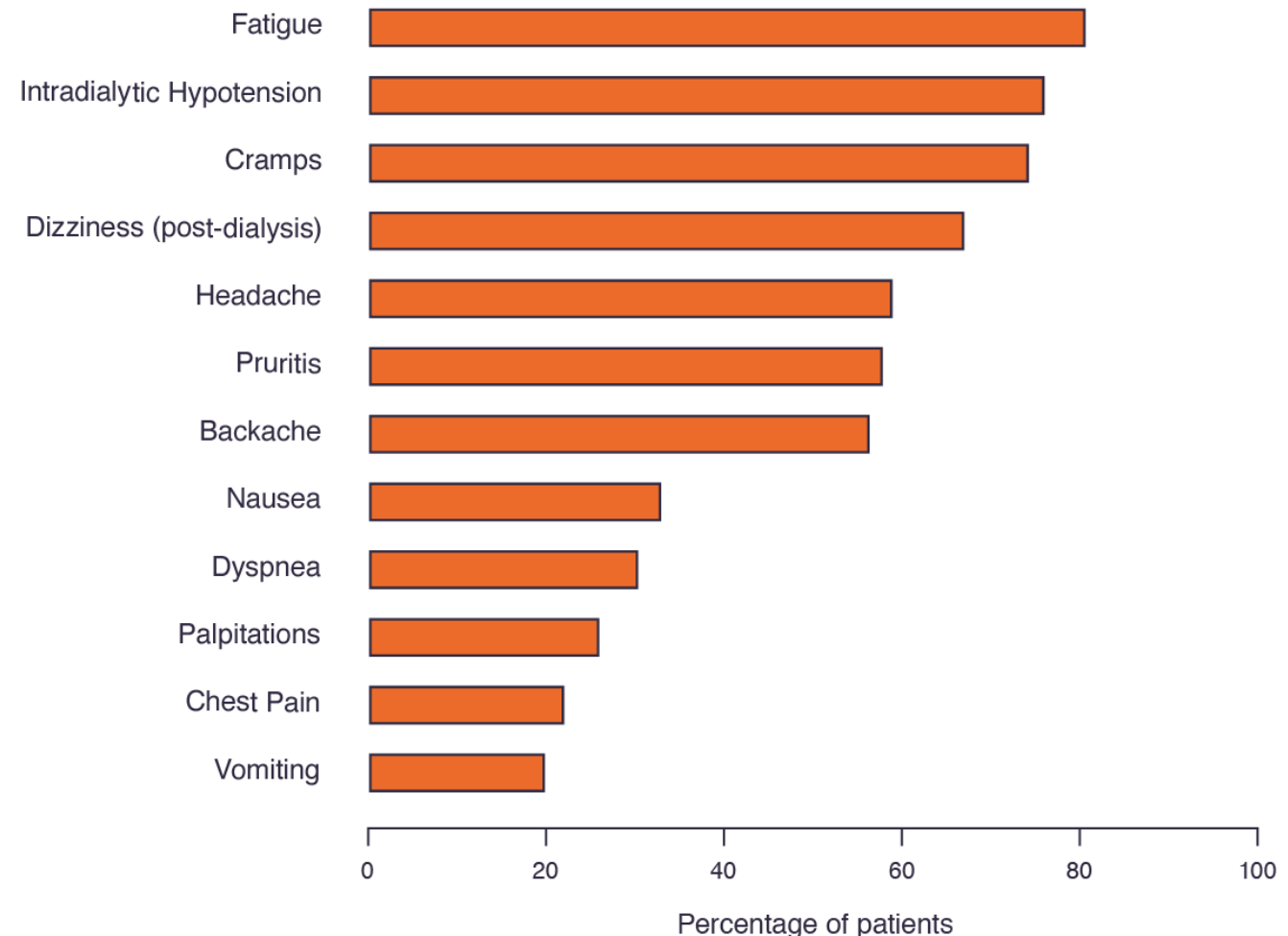


Many of the most commonly reported symptoms among hemodialysis patients and care partners were identified as being more important than life expectancy

Symptoms identified as more important included fatigue, drops in blood pressure, and cramping.

Prevalence of commonly reported symptoms in a cohort of 550 hemodialysis patients.²

¹Caplin B, Kumar S, Davenport A. Patients' perspective of haemodialysis-associated symptoms. *Nephrol Dial Transplant Off Publ Eur Dial Transpl Assoc - Eur Ren Assoc.* 2011;26(8):2656-2663. doi:10.1093/ndt/gfq763. ²Urquhart-Secord R, Craig JC, Hemmelgarn B, et al. Patient and Caregiver Priorities for Outcomes in Hemodialysis: An International Nominal Group Technique Study. *Am J Kidney Dis Off J Natl Kidney Found.* March 2016. doi:10.1053/j.ajkd.2016.02.037.

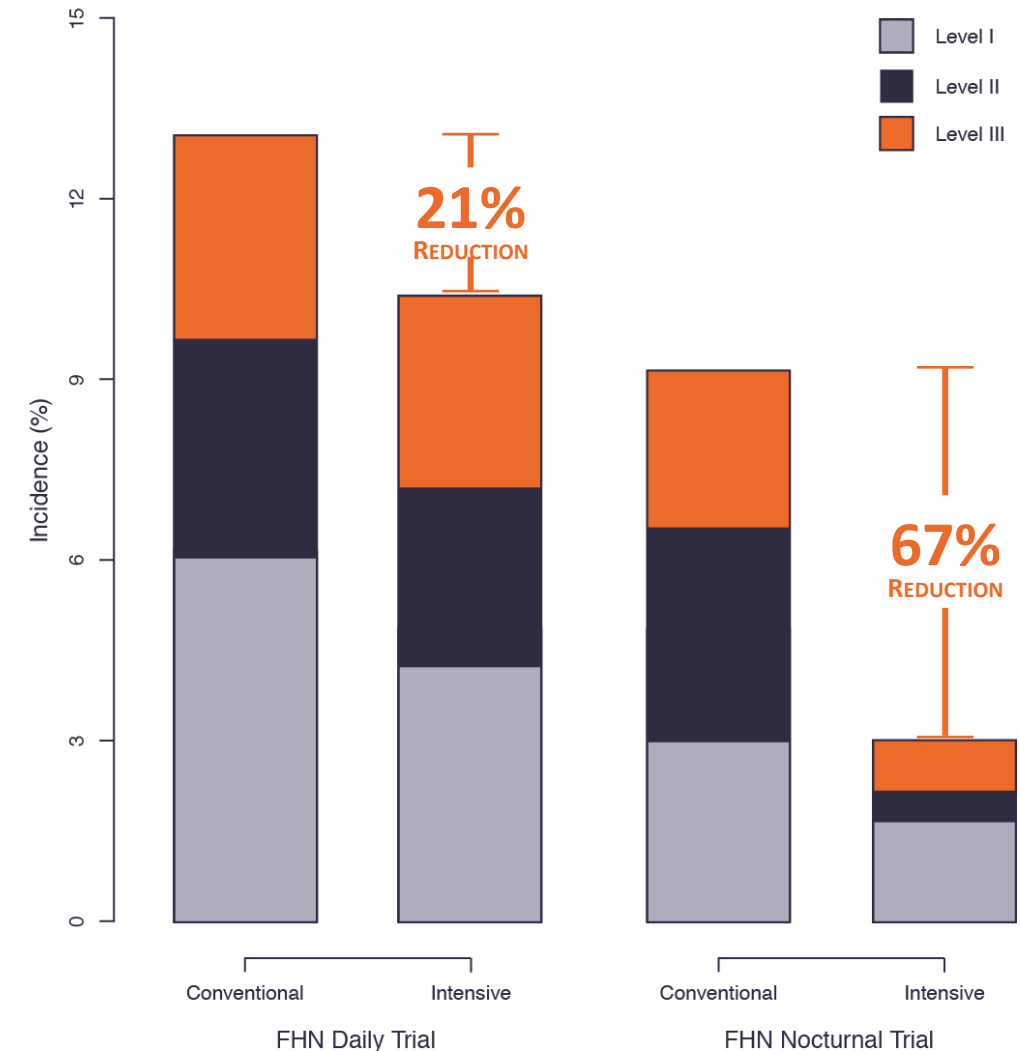


The cumulative incidence of intradialytic hypotension was significantly lower with intensive hemodialysis in the FHN Trials compared to conventional hemodialysis

Incidence of levels I, II, and III intradialytic hypotension for intensive versus conventional hemodialysis in the FHN Daily Trial and the FHN Nocturnal Trial.¹

Symptoms of intradialytic hypotension were classified into 3 categories: those that led to lowering of the UF rate or reduced blood flow (Level I); those that led to the administration of saline, but not to lowering of the UF rate (Level II); and those that led to both the administration of saline and lowering of the UF rate (Level III).

Kotanko P, Garg AX, Depner T, et al. Effects of frequent hemodialysis on blood pressure: Results from the randomized frequent hemodialysis network trials. *Hemodial Int Int Symp Home Hemodial.* 2015;19(3):386-401. doi:10.1111/hdi.12255.



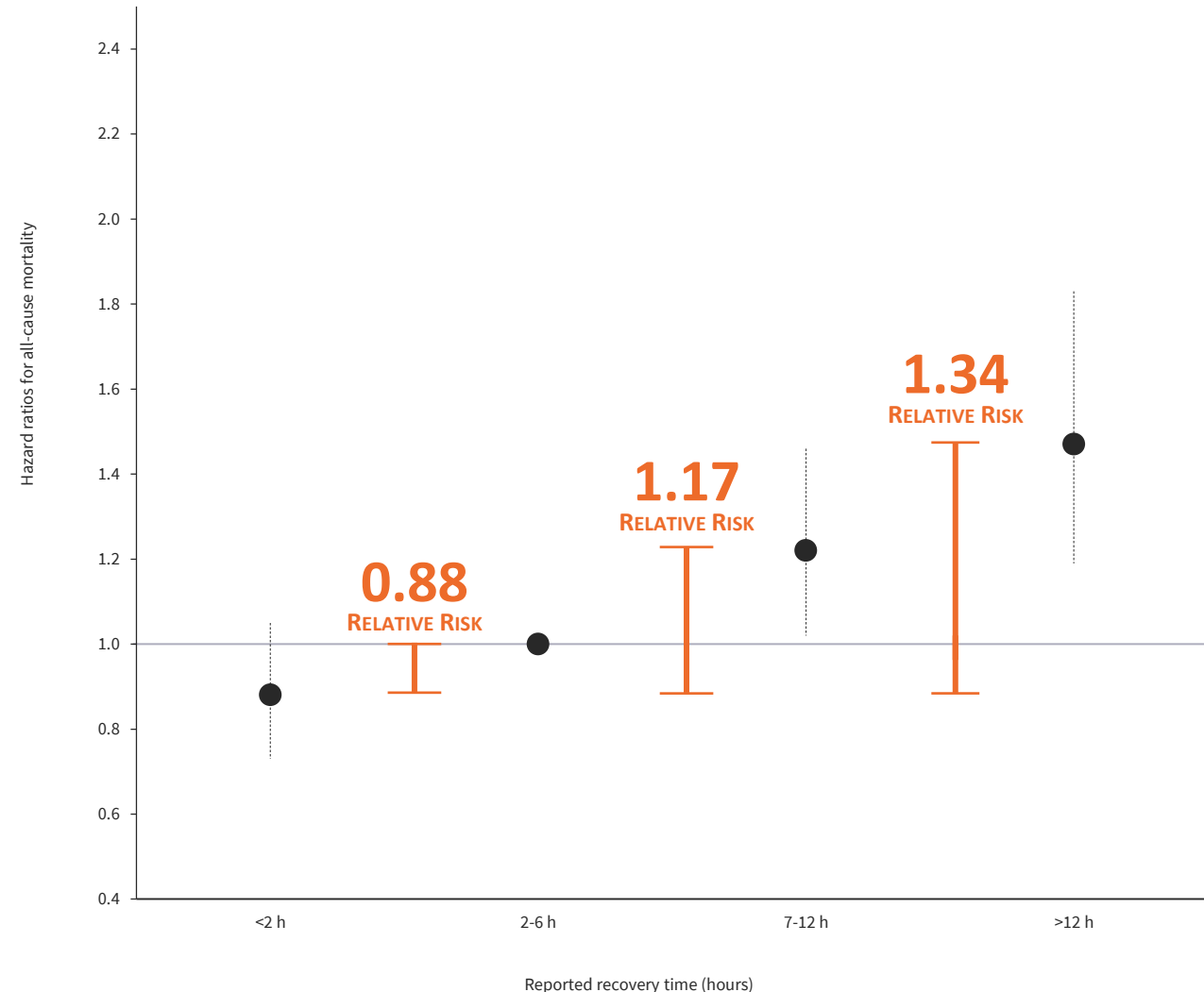
Each 1-hour increment in post-dialysis recovery time was associated with a 3% and 5% increased risk of hospitalization and death respectively

Recovery time was from 2 to 6 hours in 41% of patients, from 7 to 12 hours in 17% of patients, and greater than 12 hours in 10% of patients.¹

Hazard ratios for mortality by reported recovery time.

Dashed bars span one standard deviation above and below the mean.

Rayner HC, Zepel L, Fuller DS, et al. Recovery time, quality of life, and mortality in hemodialysis patients: the Dialysis Outcomes and Practice Patterns Study (DOPPS). *Am J Kidney Dis* Off J Natl Kidney Found. 2014;64(1):86-94. doi:10.1053/j.ajkd.2014.01.014.



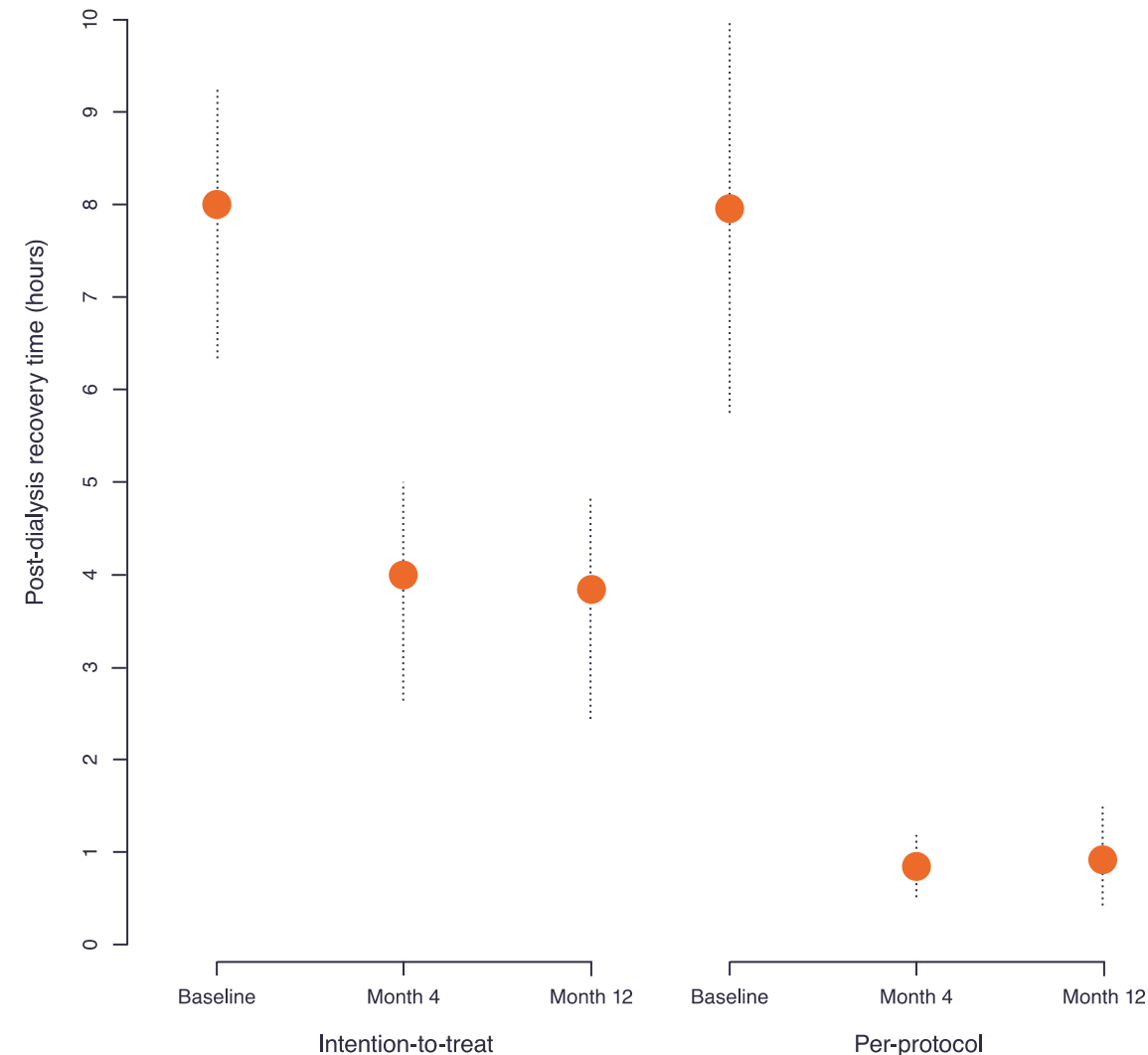
In the FREEDOM Study, the percentage of patients with recovery time less than 1 hour increased from 19% at baseline to 65% after 12 months

Mean post-dialysis recovery time fell from 7.9 hours at baseline to 1.0 hours at 4 months, and to 1.1 hours at 12 months.¹

Mean post-dialysis recovery time in intention-to-treat and per-protocol cohorts of the FREEDOM study.

Dashed bars span one standard deviation above and below the mean

Jaber BL, Lee Y, Collins AJ, et al. Effect of daily hemodialysis on depressive symptoms and postdialysis recovery time: interim report from the FREEDOM (Following Rehabilitation, Economics and Everyday-Dialysis Outcome Measurements) Study. Am J Kidney Dis Off J Natl Kidney Found. 2010;56(3):531-539. doi:10.1053/j.ajkd.2010.04.019.



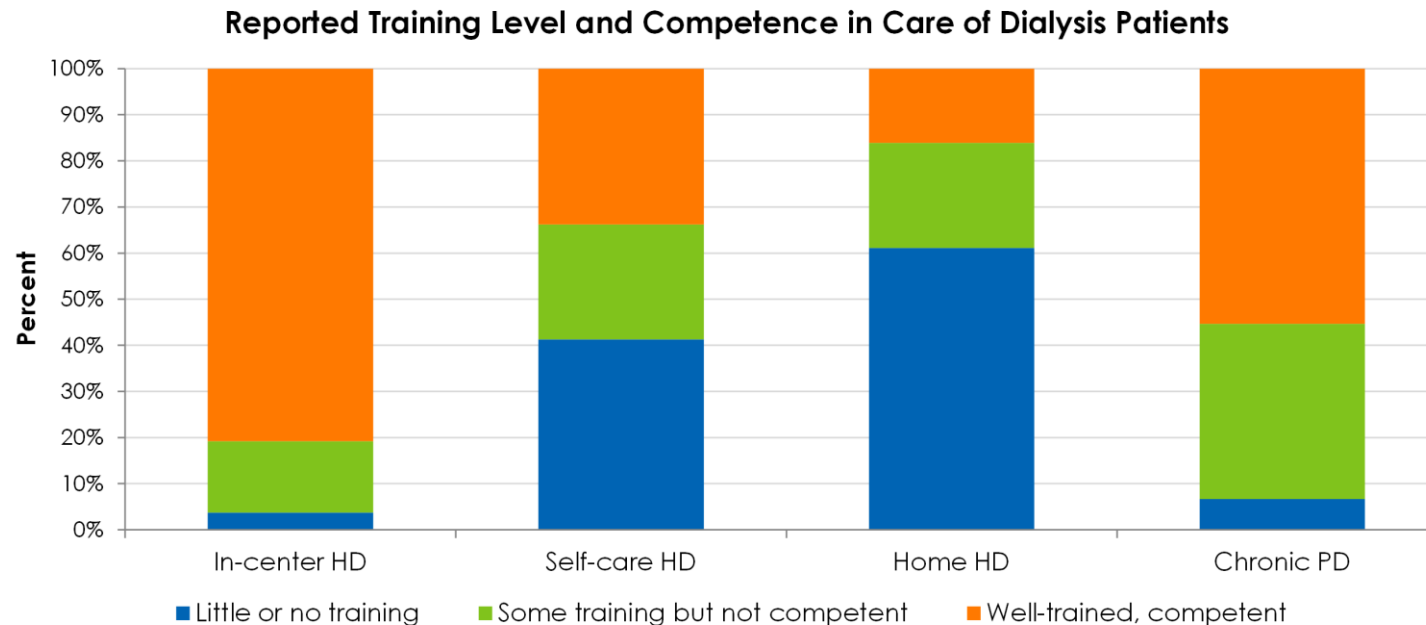
Patients Choose Home Therapy When Properly Educated

- 70 patients were randomized to receive standard care alone or standard care with educational intervention
- Within the subgroup of patients who were uncertain or planning to start in-center care at enrollment, education dramatically increased the use of home therapy

	Standard Care	Standard Care +Education
Planning to start self-care dialysis at baseline	0%	0%
Planning to start self-care dialysis at study completion	16.7%	64.2%

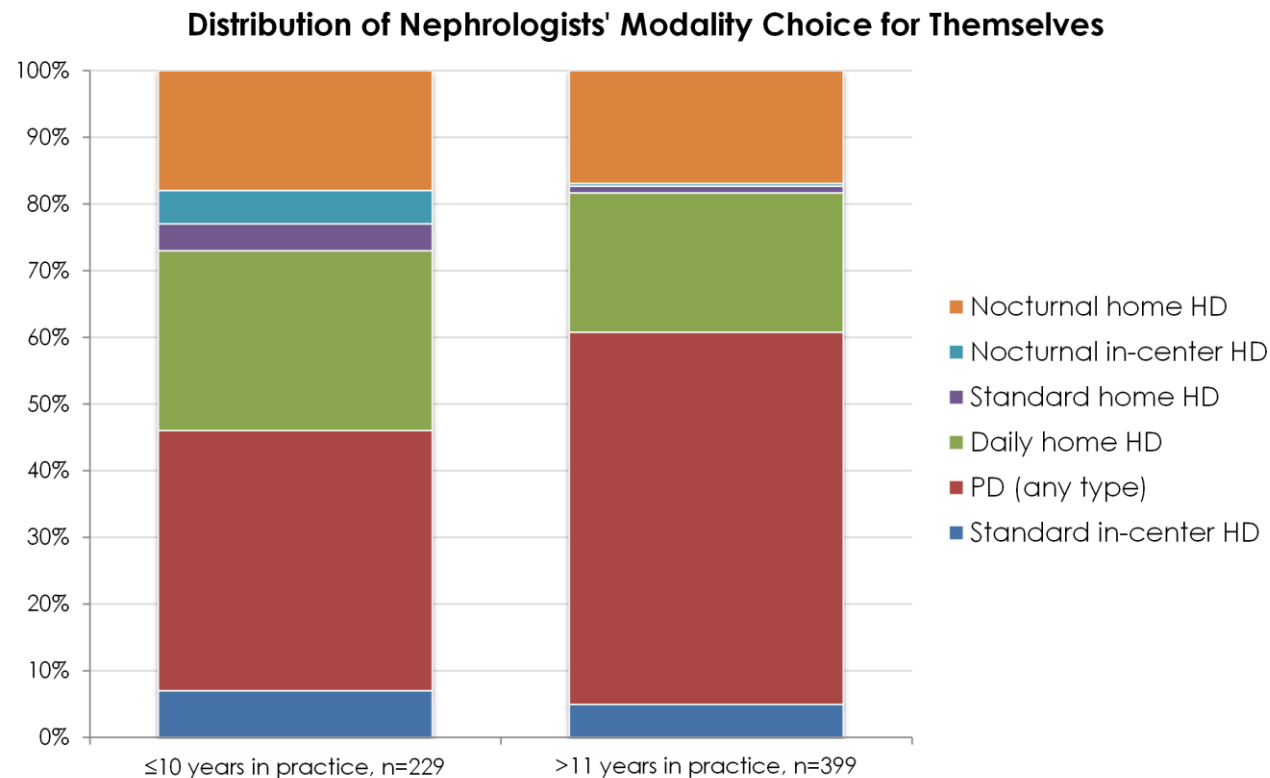
Nephrologists are not Well Trained in Home Therapies

- Survey of ASN members:
 - Gave high importance to PD and home HD training
 - However, physicians did not feel well trained or competent regarding home therapies

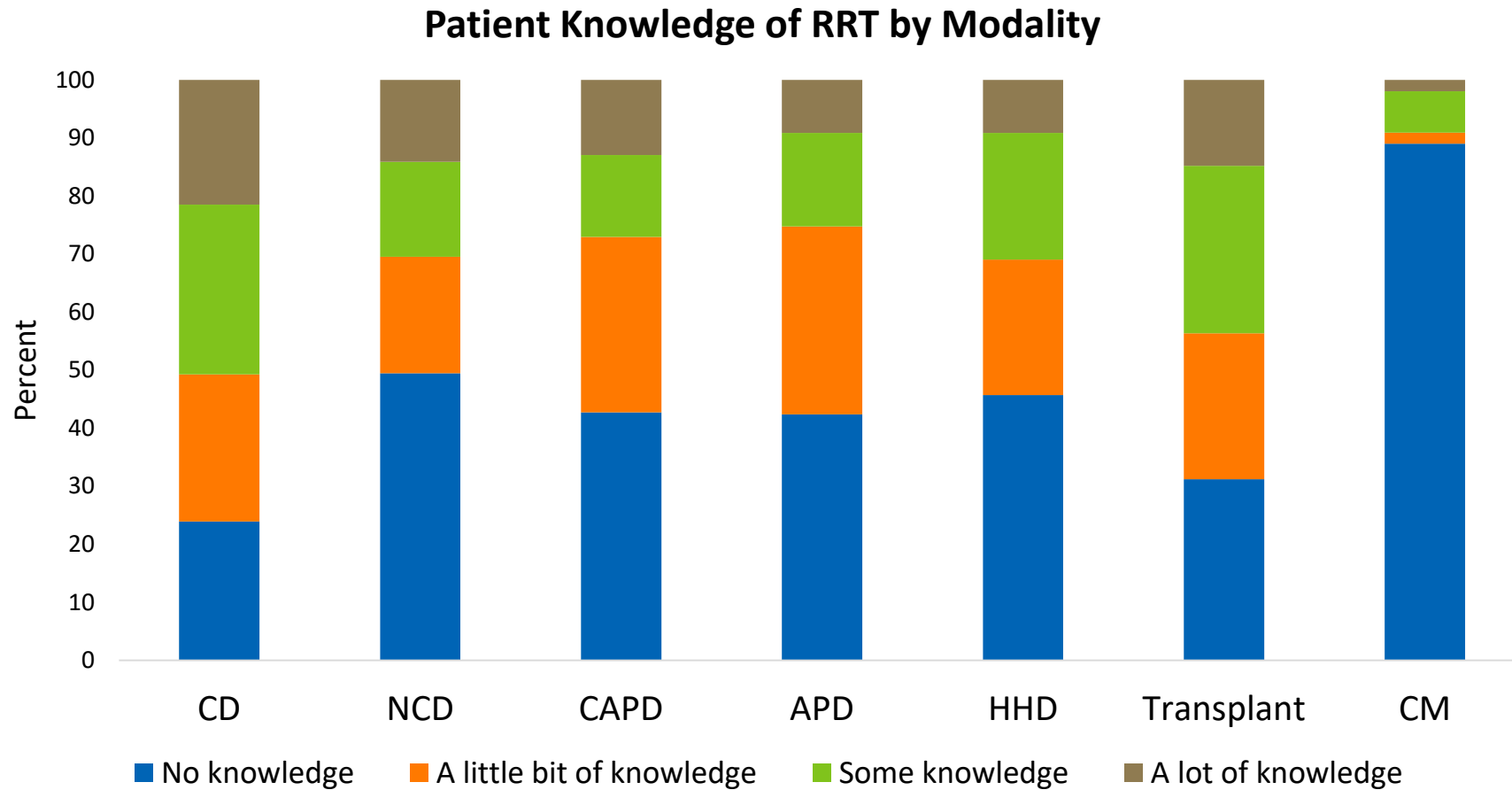


Most Nephrologists Would Choose Home Therapies for Themselves

- If nephrologists' kidneys failed and there was a 5-year wait for a transplant, 91% would choose home therapies



Patients Are Not Informed About Their Treatment Options



HHD Setup



Reverse Osmosis
Machine

Microfilters

Carbon Tank

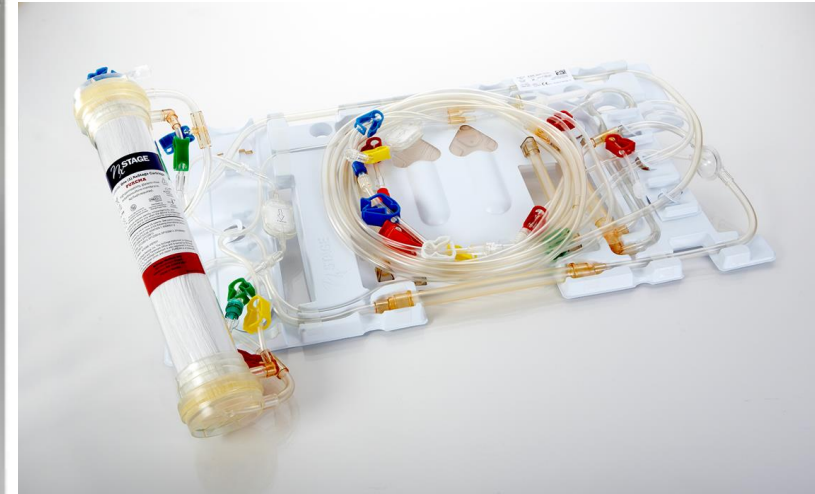
NxStage

Equipment

Dialyzer

NxStage System One
Short daily HD (SDHD)
Nocturnal HD (NHD) [off-label]
 Q_b max 600 mL/min
Fluid exchange 12 L/h
Ultrafiltration 2.4 L/h
Portable (75 lbs)
No electrical/plumbing
modifications

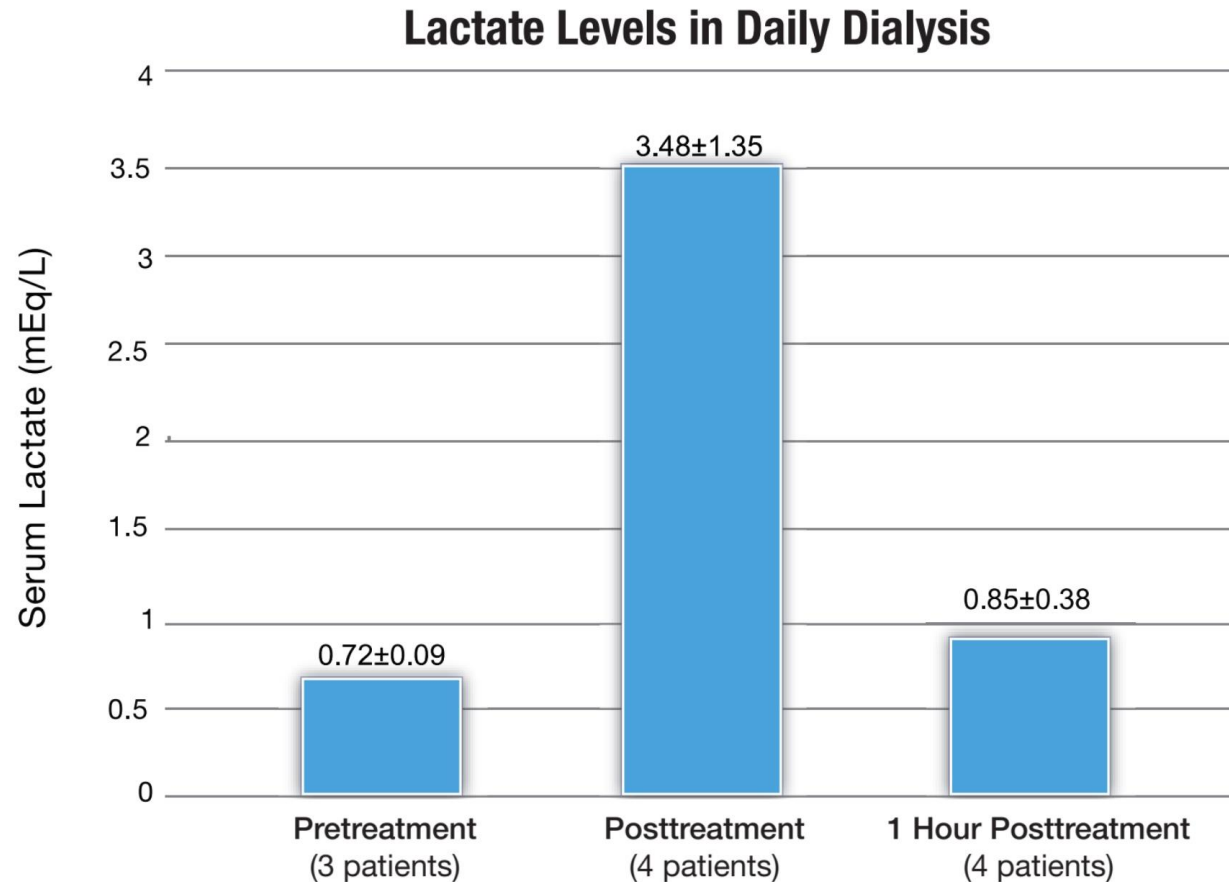
PureFlow SL
Tap water \Rightarrow ultrapure dialysate
(USP > AAMI sterile)
Deionization, carbon
adsorption, irradiation
40, 50, 60 L (2-3 d)



NxStage Dialysate

CONSTITUENT	CONV. HD	NXSTAGE
Sodium	135-145 mEq/L (135-145 mmol/L)	140 mEq/L (140 mmol/L)
Buffer/Base	30-38 mEq/L [bicarb] (30-38 mmol/L [bicarb]) 2-4 mEq/L [acetate] (2-4 mmol/L [acetate])	35, 40, 45 mEq/L [lactate] (35, 40, 45 mmol/L [lactate])
Potassium	0-4 mEq/L (0-4 mmol/L)	1, 2, 3 mEq/L 1, 2, 3 mmol/L
Calcium	2.0-3.5 mEq/L (1.25-1.75 mmol/L)	3-3.5 mEq/L (1.5-1.75 mmol/L)
Magnesium	0.5-1 mEq/L (0.25-0.5 mmol/L)	1 mEq/L 0.5 mmol/L
Glucose	2 g/L	1.1 g/L
Quality Standards Adhered To	AAMI	Bags: USP, and BP, European Pharmacopeia (EP) PureFlow SL: AAMI and ISO

NxStage Dialysate



Moran, Doss, Leypoldt, Friederichs, "Lactate Dialysate Requirements in Short Daily Hemodialysis Therapies" 2004 American Society of Nephrology Annual Meeting

Tablo

Get to know Tablo.

TOUCHSCREEN GUIDANCE

Animations and conversational instructions make Tablo easy to learn and use

TABLO CARTRIDGE

Minimizes setup and takedown time by removing manual steps

DIALYSATE ON DEMAND

Purifies water and produces dialysate in real-time

SENSOR-BASED AUTOMATION

Tablo sensors help to automate much of the setup, treatment management and maintenance

WIRELESS CONNECTIVITY

Two-way data communication can automatically send treatment data to the cloud

MOBILITY

All you need is an electrical outlet and tap water



Tablo

Tablo™ Hemodialysis System

DIALYSIS SPECIFICATIONS

Blood Flow Rate	Up to 400 mL/min
Extracorporeal Circuit Volume	140 mL (excluding dialyzer)
Maximum Ultra-filtration Rate	2,000 mL/hour
Dialysate Flow Rate	100, 200, 300 mL/min
Dialysate Preparation	Standard 45X proportioning
Dialysis Fluid Potassium (K)	1K, 2K, 3K, 4K
Dialysis Fluid Calcium (Ca)	2.5 Ca
Sodium Setting	135-145 mEq/L
Total Buffer Setting	30-40 mEq/L
Dialysis Fluid Temperature	36-38 °C
Dialyzers	Commercially available high-flux dialyzers

MAINTENANCE FEATURES

Disinfection	Automated daily heat disinfection Weekly chemical disinfection
Filter Replacements	Individually replaceable by user

TREATMENT FEATURES

Saline Bolus	Automatic with volume tracking
Blood Pressure	Integrated blood pressure cuff
Wireless Connectivity	Two-Way Data Transfer

WATER SPECIFICATIONS

Input Water Source	EPA Quality Drinking Water
Incoming Temperature	5-32 °C
Incoming Pressure	30-80 PSIG
Filtration	Integrated Sediment, Carbon, RO, Ultrafilter
Outputs Purified Water	AAMI standards met

Home HD Modality Prescriptions

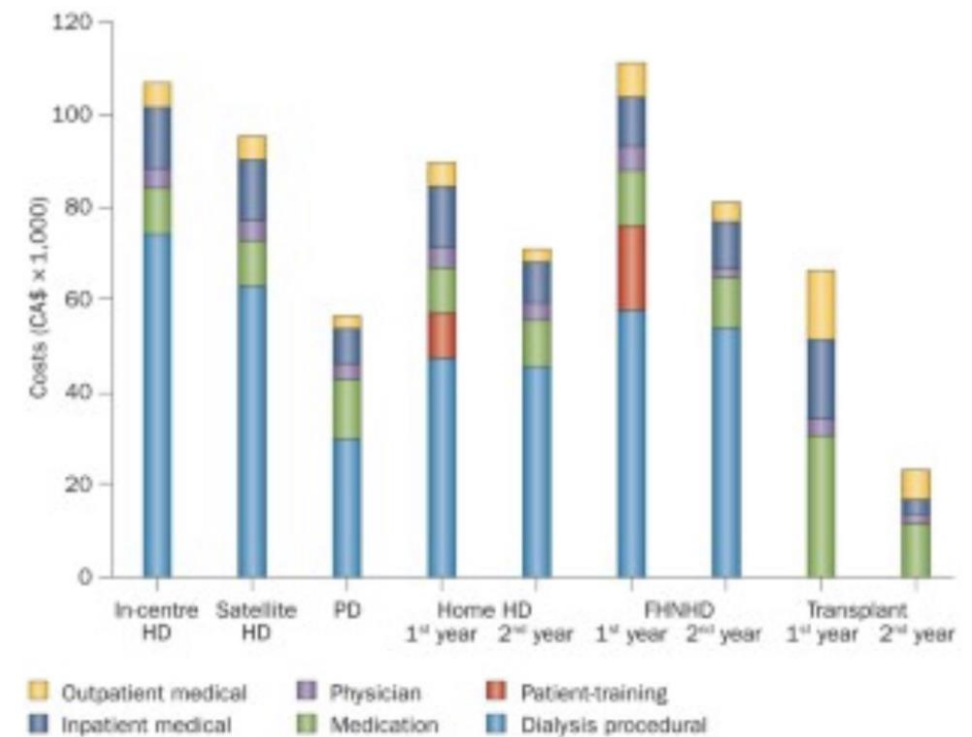
Modality	Sessions per Week	Session Duration, hours	QB mL/min	QD mL/min	Base, mmol/L	K ⁺ , mmol/L	Ca ²⁺ , mmol/L	PO ₄ added
Traditional (standard hours)	3-3.5	3-5	300-400	500-800	HCO ₃ ⁻ , 32-36	2	1.25	none
Alternate-Night Nocturnal	3.5	6-8	250-350	300-500	HCO ₃ ⁻ , 28-35	2	1.25	rare
Traditional Short Daily	5-6	2.5-3.5	350-400	350-600	HCO ₃ ⁻ , 32-36	2	1.25	none
Traditional Nocturnal	4-6	6-8	250-350	300	HCO ₃ ⁻ , 28-35	3	1.5-1.75	20-30% of time
Low-flow Dialysate Short Daily	5-6	2.5-4	300-400	90-300	Lactate, 40-45	2	1.5	none
Low-flow Dialysate Nocturnal	4-6	6-8	300-350	83-166	Lactate, 40-45	2	1.75	none



Home Dialysis-Cost

- ❑ Reduced cost of conventional treatment
- ❑ Greater Burden of cost due to ESRD
- ❑ Economic benefits if sustainable

Figure 1: Annual health-care costs of dialysis stratified by modality in Canada.



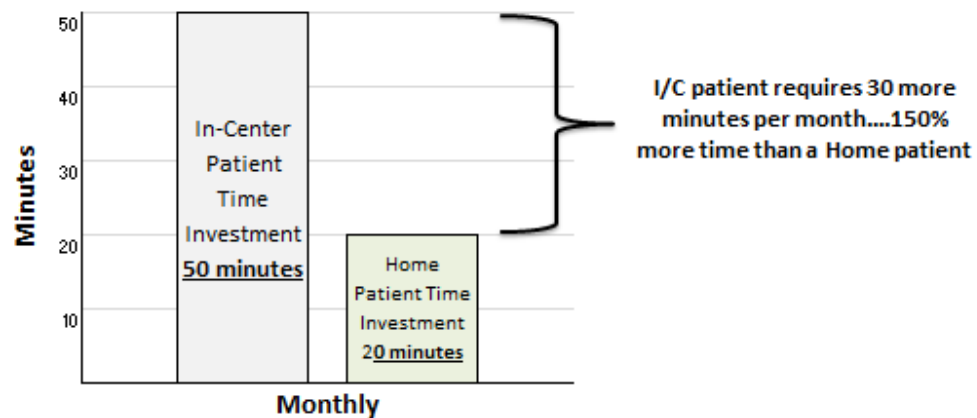
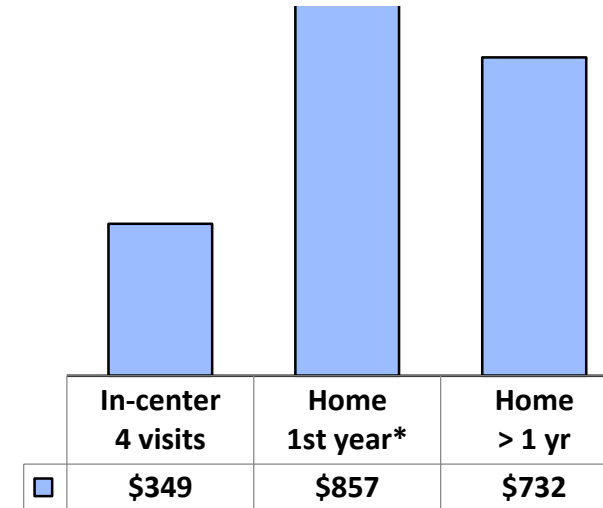
Klarenbach et al. Economic Evaluation of dialysis therapies
Semin Nephrol. 2009

Physician Perspective: Time investment – Revenue per hour

Medicare reimbursement codes and payment

OUTPATIENT DIALYSIS SETTING	VISITS (N)	CPT CODE (20 YEARS OLD OR MORE)	2018 NATIONAL MEDIAN PAYMENT
In-center	1 visit	90962	\$189/month
In-center	2-3 visits	90961	\$244/month
In-center	≥4 visits	90960	\$291/month
Home	1 visit*	90966/full month	\$244/month
Home	1 visit*	90970/part month	\$8 Per day based on # of out pt days

Revenue per hour by modality



*\$500 training reimbursement

Assumptions

- In-Center--50 minutes per month/10 hours per year
- Home -- 20 minutes per month/4 hours per year

Summary

- Home therapies (PD and Home HD) may provide significant survival benefits compared to in-center HD
- Both therapies are underutilized
 - 10.8% of patients are currently using home therapies
 - US nephrologists believe that PD or home HD are the preferable modalities for 45% of their patients
- There is potential to grow home therapies and improve patient outcomes
- Patient and provider training on modality options is essential