

# PD vs. HHD: Is HHD associated with better outcomes than PD, or is it simply patient selection?

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Nothing to disclose



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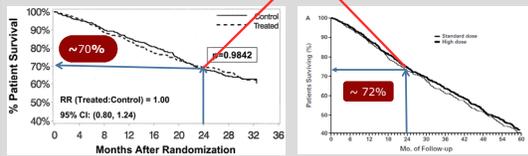
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## ADEMEX or HEMO - no difference in survival

Is this survival good enough?



ADEMEX: J Am Soc Nephrol. 2002;13:1307-1320.

Hemo:NEJM. 2002;347:2010-9.

**Patients deserve better outcomes and better choices!  
How long should they wait for scientifically pure data?**

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## HHD vs PD

- PD survival is not inferior to ICHD
- There are few studies comparing HHD to PD
- For outcomes that are better in HHD than ICHD, and are equivalent or worse in PD compared to ICHD, HHD is probably better than PD.

**If PD = ICHD**

**AND**

**HHD > ICHD**

**Then HHD > PD**

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## Benefits of more frequent HHD (compared to ICHD)

- **Improved Quality of Life**
  - Less intradialytic symptoms (hypotension, nausea, vomiting)
  - Less post dialysis fatigue
  - Improvement in Restless Legs Syndrome
- **Improved cardiovascular outcomes**
- **Improved phosphate control**

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## SDHD: The FREEDOM Study Post-dialysis Recovery Time.

Am J Kidney Dis 56:531-539, 2010

Quality-of-Life Measure	Baseline	Month 4	Month 12	P*
Postdialysis recovery time (min)				
Per-protocol cohort (n = 128)	476 (359-594)	62 (46-78)	63 (32-95)	<0.001
ITT cohort (n = 239)	473 (385-561)	240 (172-308)	237 (168-306)	<0.001

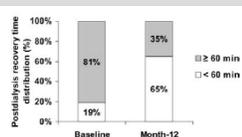


Figure 3. Distribution of postdialysis recovery time for study participants who completed 12 months of daily hemodialysis (per-protocol cohort; n = 128).  $P < 0.001$  using McNemar test.

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## Improved cardiovascular outcomes

- **Improved blood pressure control**
  - Less blood pressure medication
  - ~50-65% patients not on BP meds
  - Average decrease in SBP/DBP: 8/4
- **Regression LVH**
  - LVH associates with mortality
  - Potential modifiable risk factor for survival
- **Increase EF**
  - Implications for transplant
- **Improvement in sleep apnea (NHD)**

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## Benefits of more frequent HHD

- **Improved phosphate control**
  - Both NHD and SDHD
  - Decrease use of phosphate binders
    - But, in some patients increase in appetite still makes phosphate control a challenge
  - Dramatic in NHD
    - Often patients on no binders
    - Sometimes patients on more frequent NHD require phosphate supplement to prevent hypophosphatemia

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## Frequent Hemodialysis Network (FHN) trials

N Engl J Med 2010; 363: 2287-300  
Kidney Int 2011; 80, 1080-1091

- RCT comparing in-center CHD to **in-center** SDHD
  - 245 patients randomized
- RCT comparing home hemodialysis: 3x/week CHD vs 6x/week nocturnal HD (minimum 6 hours)
  - Initially planned for 250 patients
  - **Only 87 recruited**
- Co-primary outcomes
  - 1-year mortality and, for survivors, change in left ventricular mass (LVM)
  - 1-year mortality and, for survivors, change in RAND SF 36 Physical Health Composite (PHC)

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## What is home dialysis? What are we comparing?

- Home hemodialysis: HHD
  - More frequent hemodialysis: MFHD
  - Short daily hemodialysis: SDHD
    - 3.5-6 times per week, 2-3 hours per treatment
  - Nocturnal Hemodialysis: NHD
    - 3.5-6 times per week, 6-8 hours per treatment
  - Thrice weekly HD
  - "Out-of-center hemodialysis": OOOCHD
  - Traditional dialysis technology vs. low dialysate volume technology
  - With or without care partner
- Peritoneal dialysis: PD
  - CAPD
  - NIPD
  - CCPD

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## PD and HHD patients are different. Rioux, et al Nephrol Dial Transplant (2010) 25:2364-2367

Characteristic	PD	HHD
Age at onset of modality	62	46
Gender (male) %	57	70
Diabetes	45	24
Periph vasc disease	20	6
ICHD: 1 <sup>st</sup> modality	18%	37%
RRT vintage prior to home dialysis (years)	0.34	4.8

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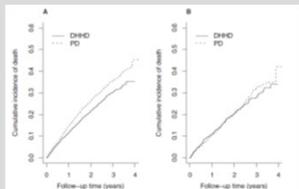
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## Survival, technique failure, and hospitalization Weinhandl AJKD, 2015

- Matched PD HHD patients
- Better survival in HHD
- Less technique failure HHD
- Less hospitalizations for access related infection
- Higher sepsis, metastatic infection of heart and bone in HHD

All patients



ESRD < 6 months  
prior to starting  
PD or HHD

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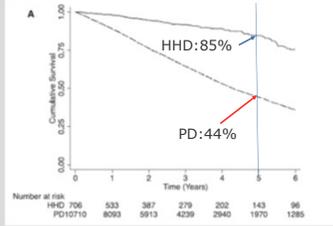
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**Survival in incident patients (ANZDATA)**  
 Nadeau-Fredette, et al CJASN 10:1397-1407, 2015

Conclusions Home hemodialysis was associated with superior patient and technique survival compared with peritoneal dialysis.

- Secondary Outcomes
- On treatment survival
  - Composite: patient and technique survival
  - Death censored technique survival
  - ALL SUPERIOR IN HHD



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**Hospitalizations and modality switch in HHD vs PD**  
 Suri, et al KI, 2015

- HHD lower hospitalization rate:
  - 0.93 vs 1.35 per patient per year
- Fewer hospital days: 5.2 vs 9.2
- Patients that remained hospitalization free:
  - 52% vs. 32%
- Patients switched to in-center HD:
  - 15% vs 44%

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**Mortality and Hospitalizations in Intensive Dialysis: A Systematic Review and Meta-analysis**  
 Mathew. A. et al Can J Kidney Health Dis 2018 5;1018.

- Intensive HD (>4 sessions/wk or >5.5 h/session) vs PD, HD
- Quality of evidence was similarly low or very low in RCTs (due to imprecision) and observational studies (due to residual confounding and selection bias).
- Intensive HD regimens may be associated with reduced mortality and hospitalizations compared with conventional HD or PD.

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## How can we compare PD and HHD?

- RCT: None
- Observational studies
  - Do we have to do this again?

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## Observational survival studies:

### Survival by Dialysis Modality—Who Cares?

Martin B. Lee\* and Joanne M. Bargman\*

*"After being asked to review a submission of yet another study analyzing the length of survival by dialysis modality with the newest statistical adjustments du jour, we contend that further studies of survival by dialysis modality have been, as it were, 'done to death'. Given the shift in emphasis toward patient-centered care, this is an urgent call for investigators to focus on issues affecting quality of life instead of duration of survival."* CJASN, 2016

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## At-home short daily hemodialysis improves the long-term health-related quality of life.

Finkelstein F.O., et al *Kidney Int* (2012) 82, 561-569

- Freedom study: prospective cohort study of at-home SDHD.
- Measured SF-36 health survey at baseline, 4 months and 12 months after initiation of SDHD.
- Mean age: 53, 66% male, 58% AVF, 45% DM.
- Both the physical and mental component summary scores improved over the 12 month period as did all individual domains of the SF-36.
- The percentage of patients achieving a physical-component summary score at least equivalent to the general population more than doubled.

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**At-home short daily hemodialysis improves the long-term health-related quality of life.**

Finkelstein F.O., et al *Kidney Int* (2012) 82, 561-569

In an accompanying editorial (*Kidney Int* 82: 511-513; 2012):

*First, as the authors acknowledge, is the potential for selection bias in a study recruiting participants for at-home short daily HD.*

*To what extent is the person enrolled in the FREEDOM Study similar to those seen in your practice?*

**I encourage and promote selection bias**

**Home dialysis is not right for every patient (in my practice)**

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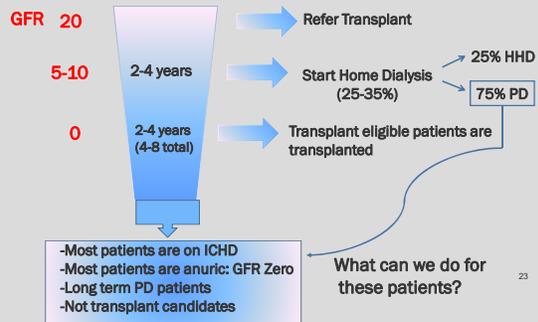
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**Modality Progression and Selection**



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**What should we do with these patients who have been on ICHD or PD for 8 years?**

- Most patients are on ICHD
- Most patients are anuric: GFR Zero
- Long term PD patients
- Not transplant candidates

- ICHD patients
- Always offer HHD

- Patients can't stay on **PD** forever
  - Loss of RRF
  - UF failure
  - EPS
- Patients will not get a transplant and have the opportunity to live long and prosper
- Patients want home therapy

**HHD is almost always an option**  
**Only hope for prolonged survival**

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**Is HHD associated with better outcomes than PD, or is it simply patient selection?**

- Answer:
  - Possibly, probably
  - So what?
  - QOL
    - Not a "group" statistic but a personal one

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**Questions?**

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