



There's No Place Like Home

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- We have no conflict of interest.

Objectives

- Introduction: Choosing a Treatment Option
- Home Hemodialysis Overview
- Pros and Cons
- Expectations
 - Patient
 - Staff

Objectives Continued

- Special Considerations
 - Experience the Difference
 - Solo
 - Nocturnal
 - Pediatrics
- Psychosocial Considerations: Plan for Success
- Conclusion: Patient Testimonials
- Questions

Introduction:

Choosing a Treatment Option

My Life, My Dialysis Choice©

- Choosing personal patient values
 - Lifestyle
 - Health
 - Partner and family
- Rating these values
- Interpretation of results

Personal Patient Values

Health Values

- I want to be able to sleep as well as I can at night
- I want the best chance for a kidney transplant
- I want to avoid taking pills as much as I can
- I want to protect my bones, joints, and nerves
- I want to protect my heart
- I want to stay out of the hospital
- I want to live as long as I can

Lifestyle Values

- I need to be able to work or go to school
- I need to be able to travel
- I want to be able to eat and drink what I like
- I love to swim and/or take tub baths
- I will NOT give up my pets
- I want to feel well from one day to the next
- I worry about how much dialysis will cost
- I need to feel in control of my time and my life
- I don't want a dialysis machine in my home
- I'm terrified of needles
- I want professionals to take care of me

Partner & Family Values

- My sex life is important to me
- I want to have (or father) a child
- I take care of a child or a disabled or elderly person
- I don't have a care partner to help me
- I want to spend as much time as I can with my family
- I don't want to be a burden on my family

(Medical Education Institute, 2019)
Used with permission from Dori Schatell, MEI

Rating Personal Patient Values

The infographic is divided into four quadrants, each representing a different dialysis modality and its compatibility with work or school. Each quadrant includes a title, a rating (represented by stars), and a list of pros and cons.

- Peritoneal Dialysis & Work / School** (Rating: 4 stars)
 - Do PD at home with a **cycler** at night while you sleep
 - You may be able to do PD at work
 - Take PD with you on work trips
 - But...**
 - Keep your PD catheter clean, as your nurse will teach you
 - Your doctor may give you limits on how much weight you can lift
 - Average of 11.3 hospital days per year (NOTE: Includes those who switched options during a year)
- Standard Hemodialysis & Work / School** (Rating: 4 stars)
 - Ask for an in-center shift before or after work or school
 - You can do **standard home HD** on your own schedule
 - But...**
 - Do home HD on your own schedule.
 - Standard in-center HD** may take time out of your work or school day
 - It may take 2-12+ hours to feel well after each treatment
 - Average of 11 hospital days per year for **standard in-center HD**. (NOTE: Includes those who switched options during a year)
 - One small study found 1/3 fewer hospital stays for **standard home HD**.
 - You may not have much energy
 - You may not think as clearly
- Daily Hemodialysis & Work / School** (Rating: 4 stars)
 - Do your treatments before or after work or school
 - More treatment for more energy
 - Take a small (75 lbs.) HD machine with you for work trips
 - But...**
 - Along with work, set-up and clean-up can mean your day is full
 - Average of 9.6 hospital days per year
- Nocturnal Hemodialysis & Work / School** (Rating: 4 stars)
 - Done at night while you sleep at home or in a clinic— no time out of your day
 - Most treatment for most energy
 - Take a small (75 lbs.) HD machine with you for work trips
 - But...**
 - Work travel can be a challenge if you use a large HD machine
 - Average of 1-6 hospital days per year for **nocturnal home HD**
 - Average of 9.6 hospital days per year for **in-center nocturnal HD**

Example: Rating the importance of being able to work and go to school among each dialysis modality.

(Medical Education Institute, 2019)
Used with permission from Dori Schatell, MEI

Interpretation of Results

Totals				
My Values	PD	Standard HD	Daily HD	Nocturnal HD
Work / School	★★★★★	★	★★	★★★★★
Travel	★★★★★	★★	★★★★	★★★★
Control	★★★★	★	★★★★	★★★★
Transplant	★★	★★	★★★★	★★★★★
Totals	17	12	19	19

Example: Total rating of each personal patient value among dialysis modalities.

Home Hemodialysis Overview

- Who _{1, 2}
 - Match-D: Method to Assess Treatment Choices for Home Dialysis
- What ₁
- When ₁
- Where ₁
- How ₁

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

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

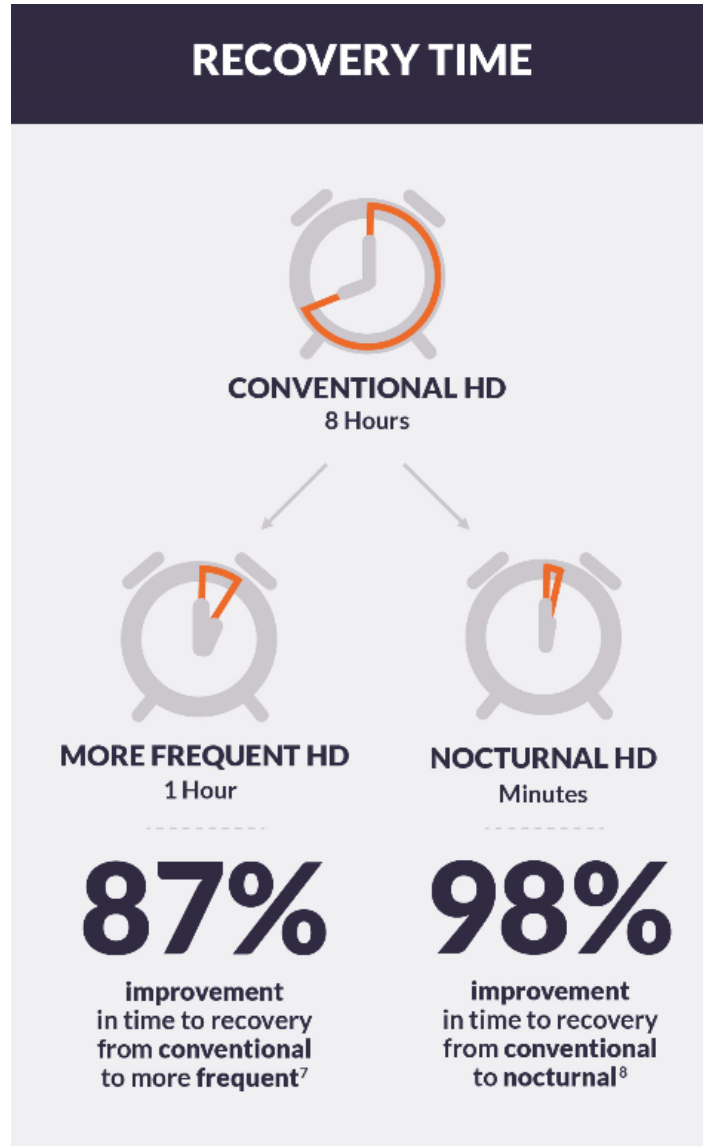
1. (Mayo Clinic, 2020)
 2. (Medical Education Institute, 2019)
- Used with permission from Dori Schatell, MEI

Pros of Home Hemodialysis

- Improved post-dialysis recovery time ^{1, 2}
- Better mental and physical health ¹
- Increased energy level ^{1, 2, 3}
- Improved sleep quality ¹
- Improved sexual satisfaction ¹

1. (NxStage, 2019)
2. (Mayo Clinic, 2020)
3. (Fresenius, 2020)

Recovery Time



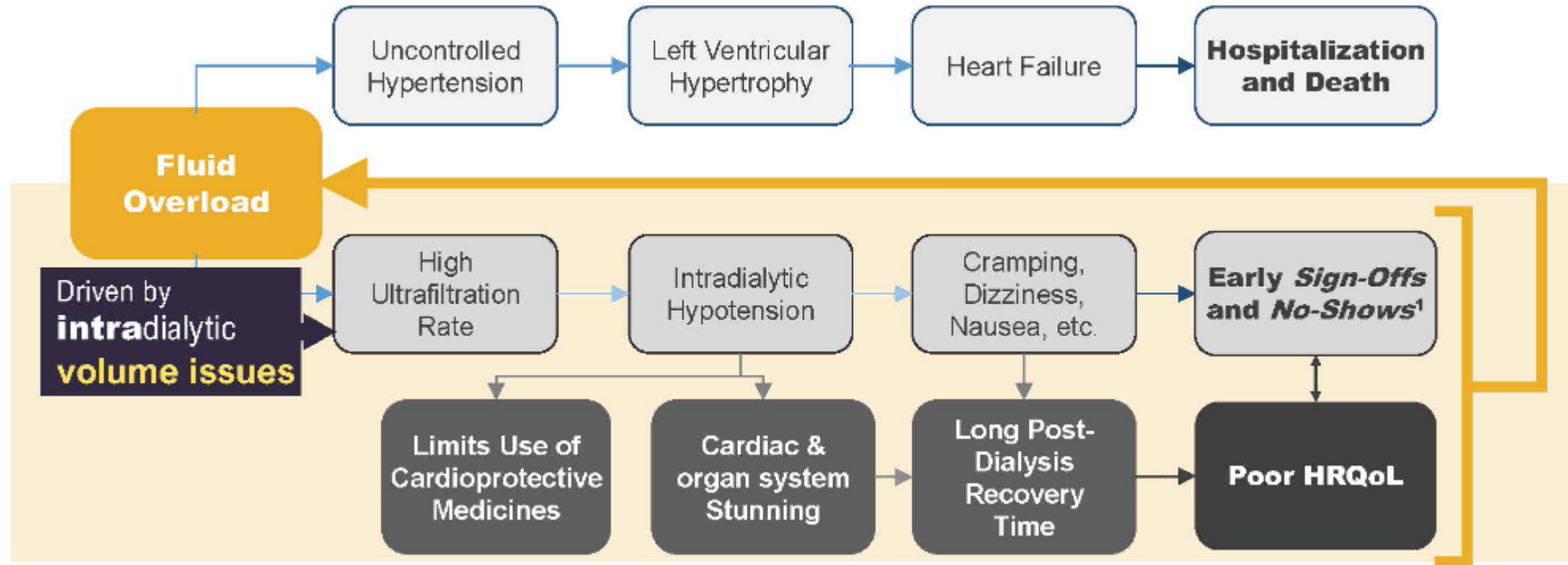
(Used with Permission from Advancing Dialysis, 2020)

Pros of Home Hemodialysis

- More independence & involvement in healthcare ^{1, 3}
- Fewer access complications ^{2, 3}
- Less stress on the heart ¹
 - Reduced left ventricular hypertrophy
 - Less myocardial stunning
 - Better blood pressure control

1. (NxStage, 2019)
2. (Mayo Clinic, 2020)
3. (Fresenius, 2020)

Fluid Overload



(Used with Permission from Advancing Dialysis, 2020)

Pros of Home Hemodialysis

- Fewer hospitalizations ^{1, 2, 4}
- Increased likelihood of transplantation ^{1, 2, 4}
- Improved patient survival ^{1, 2, 4}
- Long term treatment option ^{1, 2, 3}

1. (NxStage, 2019)
2. (Mayo Clinic, 2020)
3. (Fresenius, 2020)
4. (Medical Education Institute, 2019)

Pros of Home Hemodialysis

- Flexibility with your diet and improved appetite ^{1, 2, 3}
- Better middle to large molecule clearance ²
 - Better phosphorus control
- Fewer medications ²

1. (NxStage, 2019)
2. (Mayo Clinic, 2020)
3. (Fresenius, 2020)

Pros of Home Hemodialysis

- Ability to stay home/fewer trips to the clinic ^{1, 2, 3}
- Ability to work and go to school ^{1, 2}
- Increased ability to travel ^{1, 2}
- Portable equipment ^{1, 2}
- Easy to set up ^{1, 2}
- Customizable treatment schedule ^{1, 2, 3}

1. (NxStage, 2019)
2. (Mayo Clinic, 2020)
3. (Fresenius, 2020)

Customizable Treatment Schedule: Frequency

5+ DAYS PER WEEK

More Frequent During Waking Hours

- Improved blood pressure (BP) control & survival¹⁻⁶
- Reduced left ventricular hypertrophy & cardiovascular hospitalizations^{2,5,6,7}
- Reduced ultrafiltration rate (UFR), recovery time and hypotensive episodes^{2,3,7,8-13}
- Improved sleep quality, restless leg syndrome & health-related quality of life^{3,14-16}

More Frequent During Waking Hours

- *Benefits from 5+ days per week (above) plus:*
 - Improved sleep and obstructive sleep apnea^{12,15,17}
 - Best dialytic phosphorus control^{2,18,19}
 - Increased reduction in post-dialysis recovery time¹³

EVERY OTHER DAY

- Mitigates the 2-day gap²⁰
- May enable decreased ultrafiltration rate (UFR) by:^{2,8}
 - Increasing time per treatment
 - Increasing number of treatments per week

3 DAYS PER WEEK

- Presents room for improvement
- Longer duration treatments (example: nocturnal) has improved mortality in observational studies¹

(Used with Permission
from NxStage, 2019)

Customizable Treatment Schedule: Treatment Time

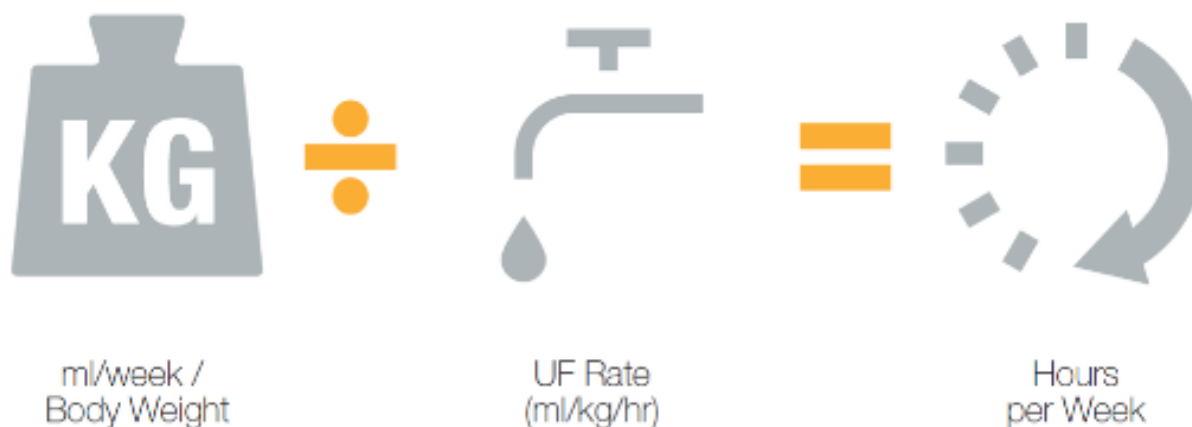
To calculate the total treatment hours per week, start with the patient's weekly fluid gain in a given week, divided by the patient's weight.

Divide the weekly fluid needing to be removed by the ultrafiltration rate to calculate the total treatment time per week.

Total treatment time per week divided by the number of treatments per week is the number of hours per treatment.

Literature suggests a UFR of 6-8 mL/kg/hour, 5-6 treatments per week and a total of at least 12 hours of treatment per week. 15 hours of treatment per week is typical.¹⁻²²

Example: If a 80kg patient is putting on 9,600 mL of fluid per week, that must be removed. With a desired UF rate of 8mL/kg/h, the result is a treatment time of 15 hours per week.



(Used with Permission
from NxStage, 2019)

Customizable Treatment Schedule: Dialysate Volume

Weight (kg)	6 days / week	5 days / week	4 days / week	3.5 days / week
<60 kg	20	20	25	30
80 kg	20	25	40	40
100 kg	25	30	50	60
120 kg	30	40	60	
140 kg	40	50	60	

Allows for UF of <1.5 L/day
Minimum of 20L of dialysate per treatment.

(Used with Permission
from NxStage, 2019)

Cons of Home Hemodialysis

- Increased responsibility ^{1, 2, 3}
- Patient and/or caregiver must perform all tasks independently ^{1, 2, 3}
- Training takes place over several weeks ^{2, 3}
- Can be stressful on the patient/caregiver ^{1, 2, 3}
- Medicare and insurance does not pay for an in-home helper ^{2, 3}

1. (NxStage, 2019)
2. (Mayo Clinic, 2020)
3. (Fresenius, 2020)

Cons of Home Hemodialysis

- Appropriate storage of supplies ^{1, 2, 3}
- Water hook up, if applicable ^{1, 3}
 - Increased water usage
- Permission from landlords ¹
 - Rental insurance
- Increased amount of waste products ¹

1. (NxStage, 2019)
2. (Mayo Clinic, 2020)
3. (Fresenius, 2020)

Storage Tips

5 expert ideas for storing HD supplies

- 1 **Consider stacking up, not out.** Based on your space, you may have the option to stack some supplies vertically as long as they're stable. This could use less floor space.
- 2 **Maximize unused storage space.** Try sliding supplies under beds or stacking them in closets, out of sight.
- 3 **Store small supplies in stackable storage drawers.** Using drawers on wheels will let you move supplies out of the way when not in use.
- 4 **Order fewer supplies at a time.** It's best to have 6 weeks of supplies at home. If you have storage issues, you may be able to order a smaller amount more frequently.
- 5 **Unpack supplies from boxes.** This can cut down on volume. Note that some supplies should remain in boxes if there's a chance you'll return them later.

(Fresenius, 2020)

Expectations

Patient

- Participate in training program ^{1, 2}
- Monthly clinic visits ^{1, 2}
 - In-person
 - Virtual
- Treatment logs documented and submitted monthly ¹
- Monthly blood tests ^{1, 2}
- Quarterly and annual water samples, if applicable ^{1, 2}
- Routine equipment maintenance ^{1, 2}
- Order monthly supplies ¹

Staff

- Provide training and reeducation as needed ^{1, 2}
- Initial home assessment and post-training home visit ¹
- Review laboratory data and Kt/V with patient ¹
- Review treatment logs with patient ¹
- Review medications with patient ¹
- Availability of nephrologist, nurse practitioner or physician's assistant, nurse, social worker, dietitian, dialysis technician ^{1, 2}

1. (Mayo Clinic, 2020)
2. (Fresenius, 2020)

Special Considerations

- Experience the Difference
- Nocturnal Home Hemodialysis
- Solo Home Hemodialysis
- Pediatric Patients

Experience the Difference

- Patients who are currently on in-center HD can trial the procedures, set up, and treatment regimen for 1 week on the home HD machine ^{1, 2}
- Care partners are encouraged to come ^{1, 2}
- Patient can then decide if they want to pursue home HD or not ^{1, 2}

1. (NxStage, 2019)
2. (Mayo Clinic, 2020)

Nocturnal Home Hemodialysis

- Performed overnight while the patient is asleep ^{1, 2, 3}
 - Slower
 - Longer
- Care partner is required ^{1, 2}
- Requires additional training ^{1, 2}
- Additional devices ^{1, 2}
 - Heparin pump
 - Enuresis device
 - Extended cyclor base, if applicable
 - Cartridge holder, if applicable
- Pros and cons ^{1, 2, 3}



1. (NxStage, 2019)
2. (Mayo Clinic, 2020)
3. (Fresenius, 2020)

Solo Home Hemodialysis

- FDA approved in August 2017 ^{1, 2, 3}
- Tips and tricks ¹
 - Set up
 - During treatment
- Additional devices ^{1, 2}

1. (NxStage, 2019)
2. (Mayo Clinic, 2020)
3. (Fresenius, 2020)

Pediatric Patients

- Parents and caregivers are trained
- Same pros and cons highlighted before apply to pediatric patients

(Mayo Clinic, 2020)

Psychosocial Considerations: Plan for Success

- Set goals and create an action plan
- Caregiver burden
 - Divide tasks
 - Organization
 - Respite
- Schedule
 - Personal life
 - Dialysis
- Financial constraints
- Mental health/patient mood
- Routine check-ins

Conclusion



Cardiovascular Decline

74yo Taiwanese female. Experiencing cognitive decline and Recurrent Heart Failure. Not happy with QoL and declining. Does not speak English, but their care partner does.

Prior Therapies / Symptoms

- Frequent symptomatic episodes of severe intradialytic hypotension requiring IVF and d/c UF
- Pre-dialysis BP frequently >200/110
- Post-dialysis hypotension

Sample prescription

- Initiated HHD @ 6x/week for 2 hrs/tx
- 15L of dialysate per treatment
- Transitioned to 5x/week for 2.5 hrs/tx to decrease burden of therapy
- 20L of dialysate per treatment

Outcomes

- Normotensive BP
- No left ventricular hypertrophy
- No depressive symptoms
- Traveled to Taiwan twice



Unhappy With In-center HD Outcomes

43yo white male with medullary cystic kidney disease.

Prior Therapies / Symptoms

- Started ICHD in 1997
- Left Ventricular Hypertrophy (LVH)
- Intermittent AFib
- Severe RLS
- Post-dialysis fatigue
- Reduced muscle mass
- Severe hypertension controlled with 4 medications
- Forced into retirement
- Kidney matched, but clotted venous returns and pulmonary emboli
- Transplant not placed, but IVC filter was

Sample prescription

- Initiated nocturnal HHD 5x/week for 8hrs/tx
- 30L of dialysate per treatment

Outcomes

- No edema or fluid overload
- No LVH
- BP controlled without medication
- Activity remarkably improved and travels as desired



PD No Longer Adequate

37yo African American male. Crashed into dialysis with CKD5, presumed from hypertension.

Prior Therapies / Symptoms

- Initially prescribed in-center HD with tunneled dialysis catheter
- Cardiac ischemia and hypotensive during dialysis
- Severe post HD fatigue
- Poor BP control
- Unable to work
- Noncompliant
- Transitioned to PD
- 3.5 years after initiating PD, RRF abruptly declined
- 2 peritonitis episodes within 6 months

Sample prescription

- Initiated HHD @ 5x/week
- 30L of dialysate per treatment
- Transitioned to solo HHD due to loss of care partner

Outcomes

- Afib resolved
- Weight increased from 89kg to 98kg
- Improved activity, sleep, anorexia, and cognitive function

(Used with Permission from NxStage, 2019)

Any Questions?

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