# How Can We Effectively Educate and Train Home Dialysis Providers

Dr. Christopher T Chan MD FRCPC
Professor of Medicine – University of Toronto
Director – Division of Nephrology - UHN

HOME DIALYSIS

UHN
Toronto General
Toronto Western
Princess Margaret
Toronto Rehab

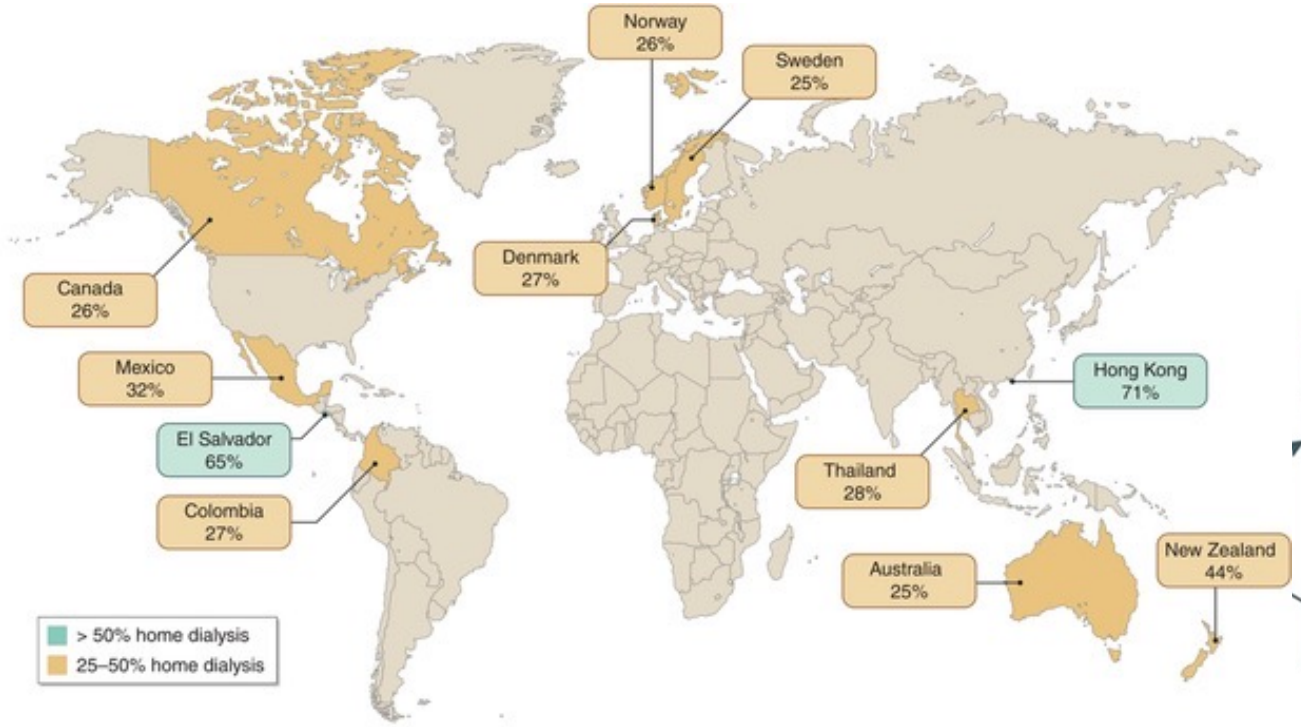
# Disclosure

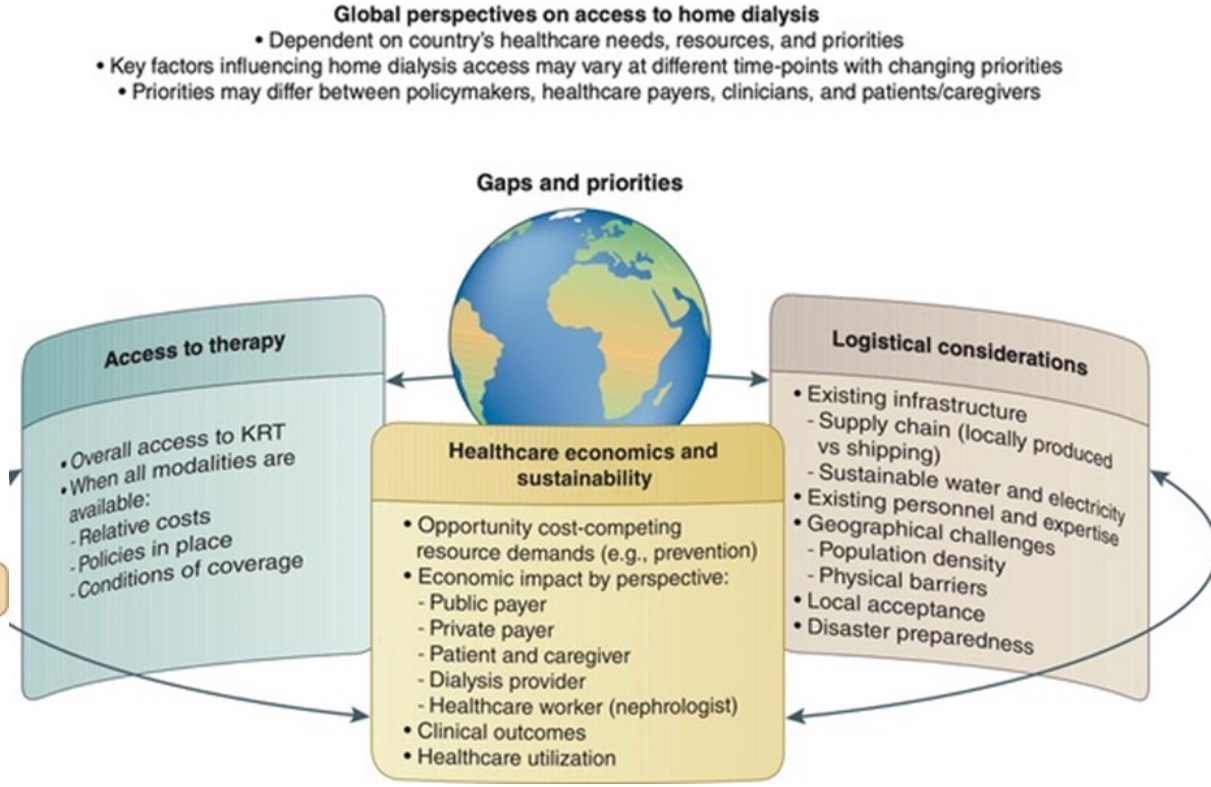
- Consulted for Medtronic, Quanta, Dialco
- Investigator – initiated grant support from Medtronic

# Objectives

- What is the current state of home dialysis education for nephrologists?
- Is there a need for something new?
  - Why?
  - Impact?

# Global Home Dialysis – Trends and Issues



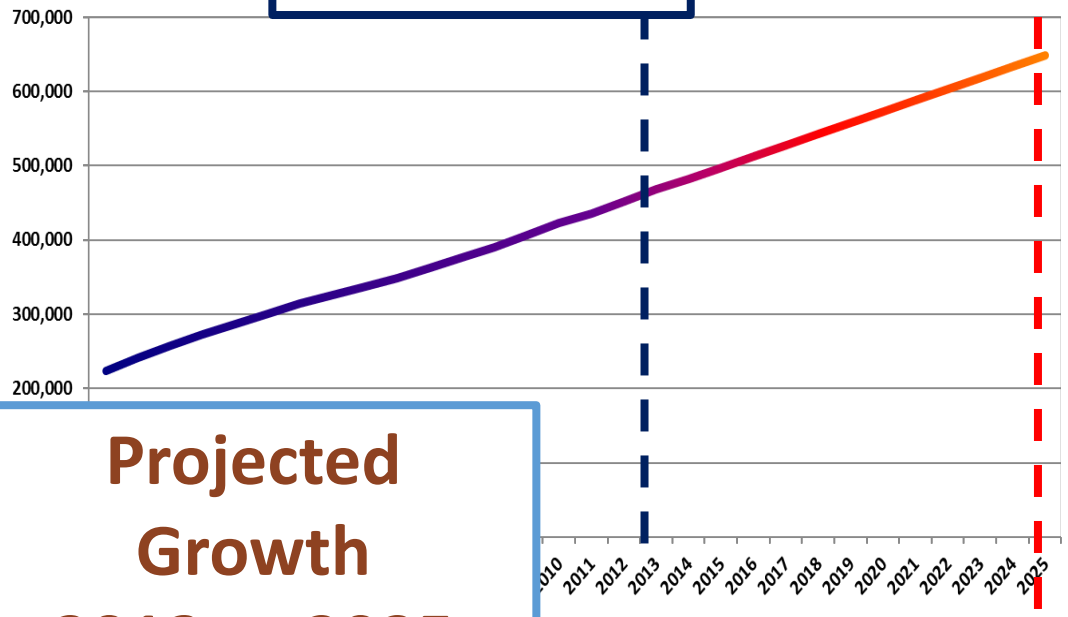




KDIGO Consensus – Home Dialysis (under review)

# Projected dialysis population growth
## 2013 TO 2025

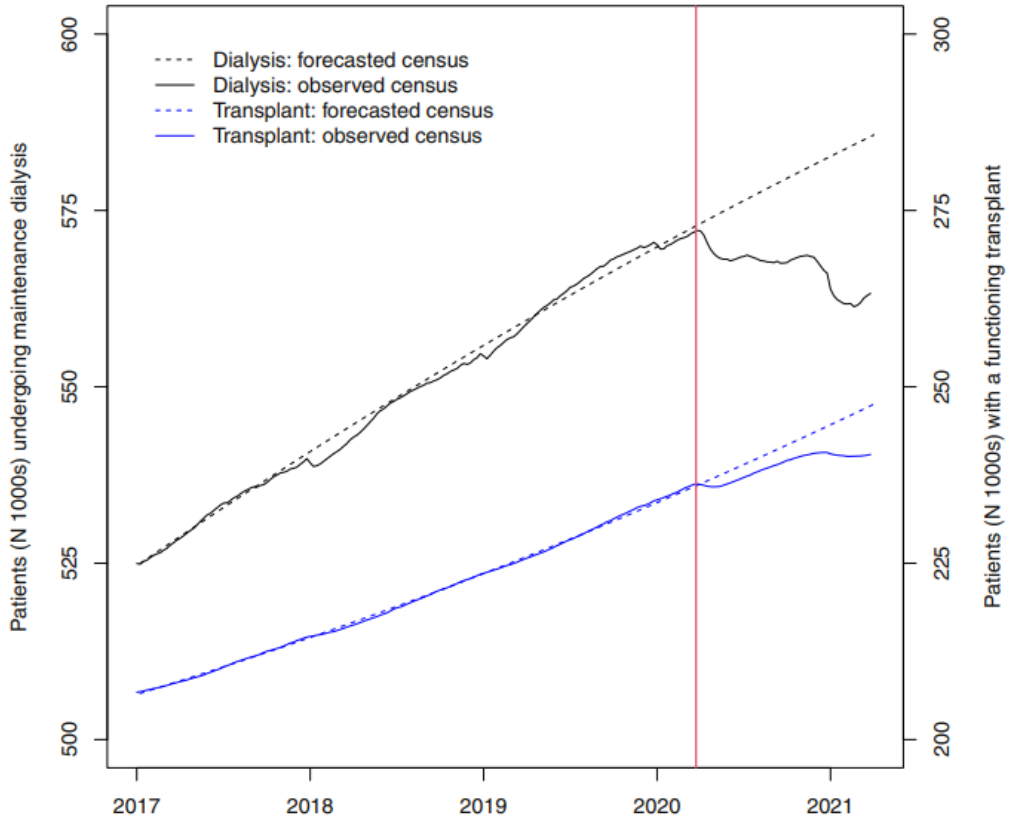
**Dialysis 2025: 649,392**

**Dialysis 2013: 468,386**




**Projected Growth 2013 to 2025 181,006 (+38.6%)**

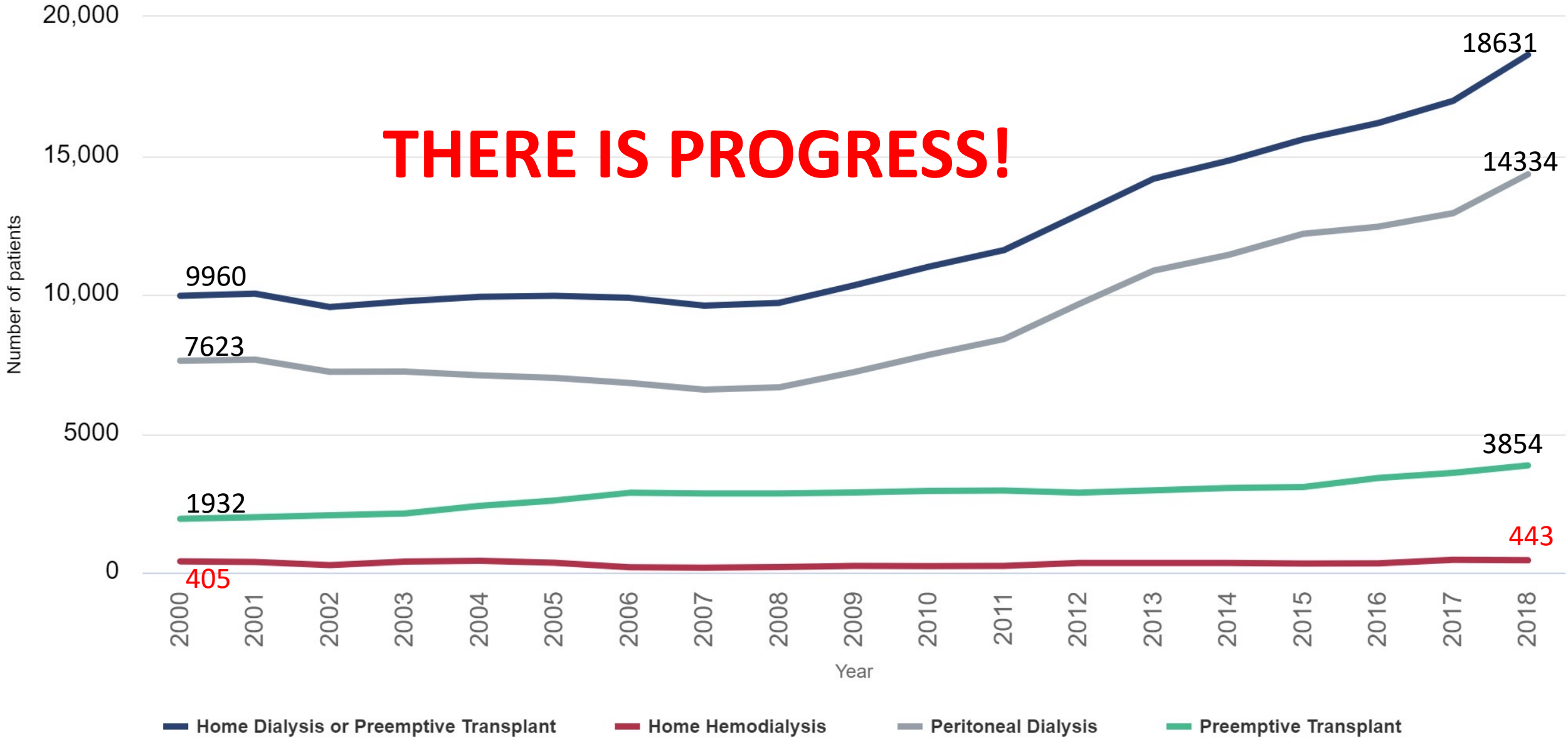
PRE COVID PREDICTION




POST COVID PREDICTION

Weinhandl et al KI report 2021

Figure 1.9 Utilization of home dialysis and preemptive transplant among incident ESRD patients, 2000-2018




Data Source: 2020 United States Renal Data System Annual Data Report

# Home Dialysis Knowledge Barriers

- Educational opportunities are episodic not longitudinal
- Few opportunities for dynamic hands-on learning
- Few existing pathways to establish mentorships
- Limited exposure in fellowship to home dialysis education experience

# Education Awareness

**Education in Nephrology Fellowship: A Survey-Based Needs Assessment**

Robert W. Rope,* Kurtis A. Pivert,† Mark G. Parker,‡ Stephen M. Sozio,§‖ and Sylvia Bereknyei Merell¶

**Table 4.** Additional instruction during fellowship (266 fellows responded)

| Which Topics Would You Most Like to Receive Additional Instruction in during Fellowship? | *N* (%) |
|---|---|
| HHD | 136 (51) |
| PD | 119 (45) |
| Kidney ultrasound interpretation | 118 (44) |
| Acute GN diagnosis/management | 101 (38) |
| Obstetric nephrology | 95 (36) |

JASN 2017: 1983 - 1990

Kidney360



Brief Communication

# The implementation of a virtual home dialysis mentoring program for nephrologists

Graham Abra, Ali Poyan Mehr, Christopher T Chan and Brigitte Schiller

Kidney360 January 2022, 10.34067/KID.0000202022; DOI: https://doi.org/10.34067/KID.0000202022

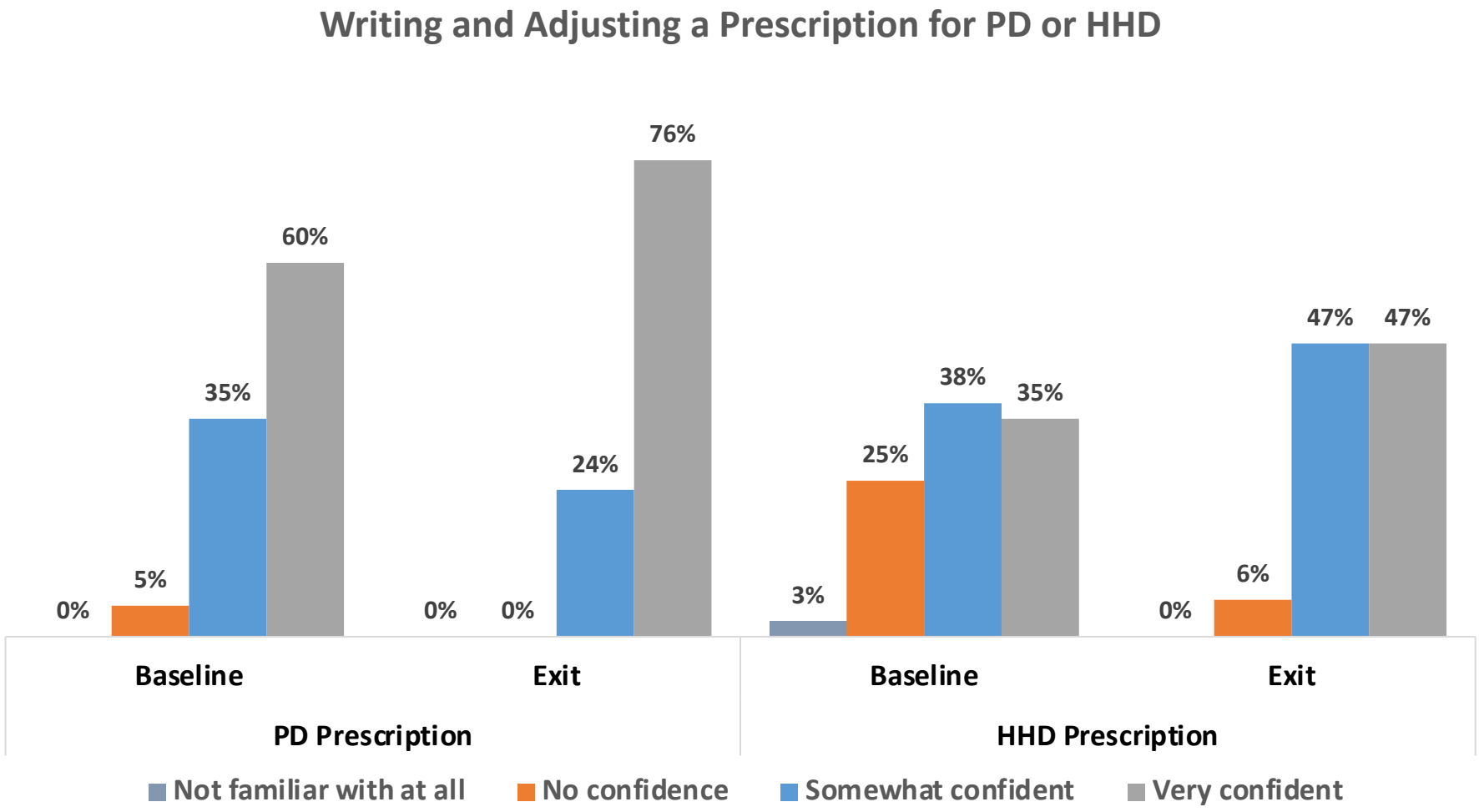
GA and CC are co-principal investigators for this project which is supported by the Norman S. Coplon APCR Grant Program.

# Physician and Practice Attributes

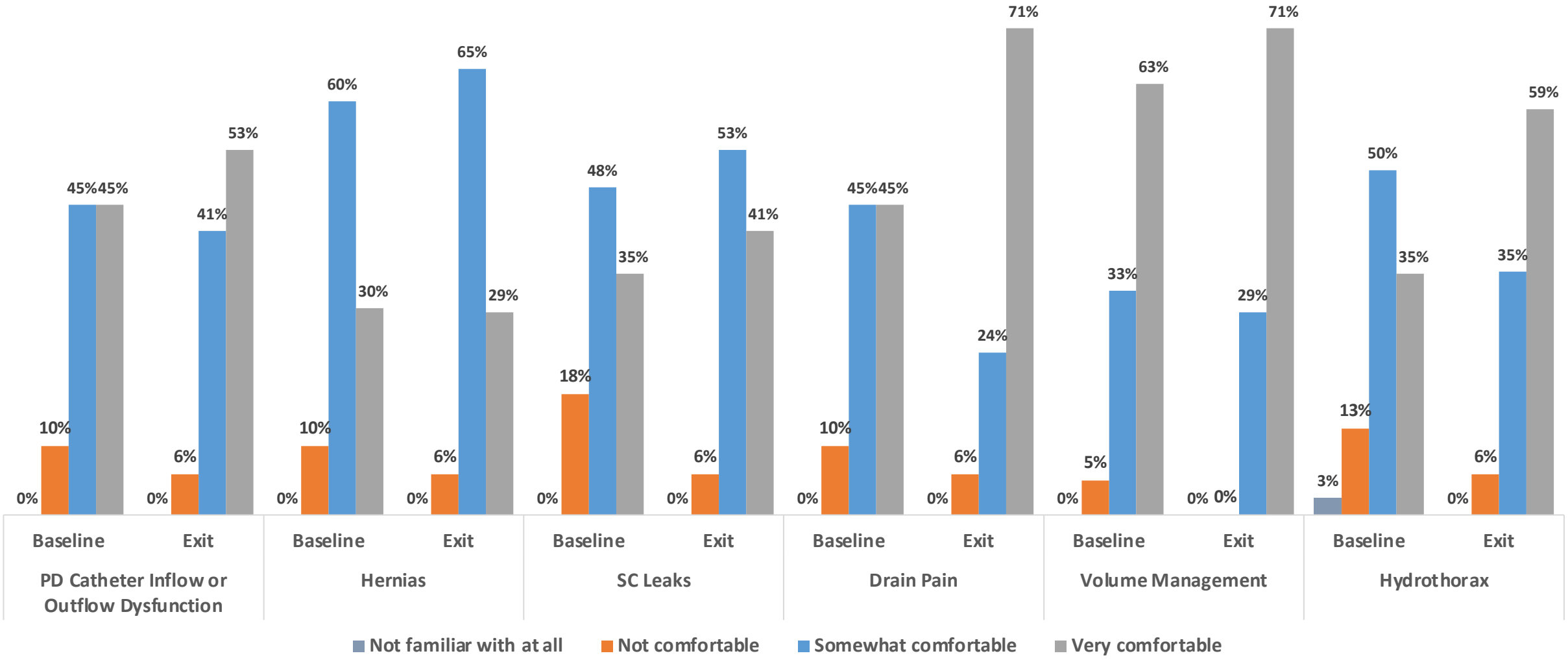
| Physician and Practice Attributes | N | % |
|---|---|---|
| **Years in Practice** | | |
| Currently a fellow | 7 | 18% |
| Less than 5 | 6 | 15% |
| Between 5 and 9 | 11 | 28% |
| Between 10 and 19 | 10 | 25% |
| 20 and above | 5 | 13% |
| Not answered | 1 | 3% |
| **Total Patients** | | |
| Below 20 | 9 | 23% |
| Between 20 and 99 | 19 | 48% |
| Between 100 and 199 | 9 | 23% |
| 200 and above | 2 | 5% |
| Not answered | 1 | 3% |
| **PD Patients** | | |
| Below 10 | 19 | 48% |
| Between 10 and 29 | 13 | 33% |
| Between 30 and 99 | 5 | 13% |
| 100 and above | 2 | 5% |
| Not answered | 1 | 3% |
| **HHD Patients** | | |
| Below 10 | 33 | 83% |
| Between 10 and 39 | 4 | 10% |
| Between 40 and 99 | 1 | 3% |
| 100 and above | 1 | 3% |
| Not answered | 1 | 3% |

| Physician and Practice Attributes | N | % |
|---|---|---|
| **Are you a Medical Director at a center offering only home dialysis?** | | |
| No | 31 | 78% |
| Yes | 9 | 23% |
| **Are you a Medical Director at a center offering both home and in-center hemodialysis?** | | |
| No | 32 | 80% |
| Yes | 8 | 20% |
| | | |
| **Are you a Medical Director at a center offering only in-center hemodialysis?** | | |
| No | 28 | 70% |
| Yes | 12 | 30% |
| | | |
| **How would you describe your nephrology practice?** | | |
| Academic | 19 | 48% |
| Small group private practice | 13 | 33% |
| Integrated system practice | 4 | 10% |
| Solo private practice | 3 | 8% |
| Multispecialty private group practice | 1 | 3% |

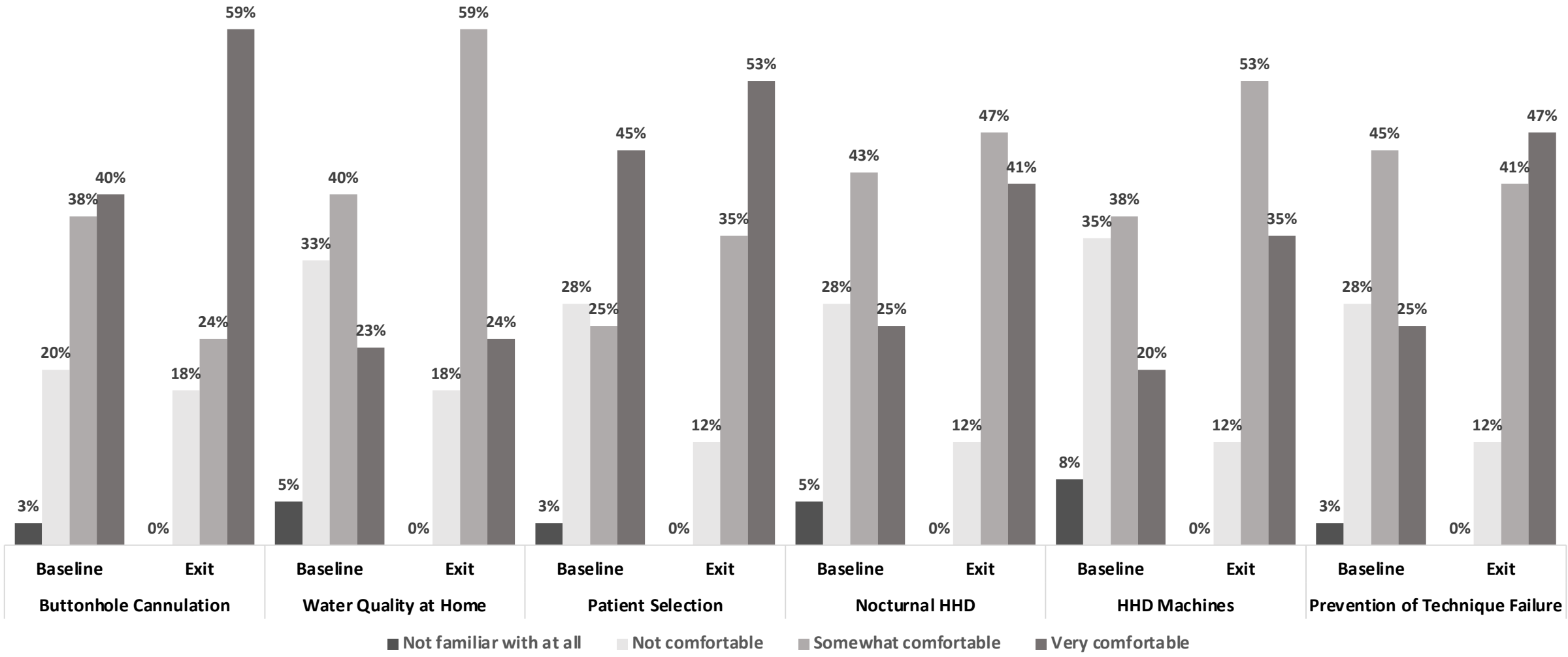
# How confident are you with…



# How Comfortable Are You With Managing Complications Of PD?



# How Comfortable Are You With Managing HHD Issues?



# Home Dialysis ECHO Update

- Project ECHO – a videoconference-based collaborative, CME/CE accredited, case-based learning program.
- NKF & Comagine Health (ESRD Network 16) partnered to develop a pilot program with the goal of building clinicians' confidence levels and improving home dialysis uptake and retention. Pilot launched March 11, 2021 concluded on March 24, 2022.
- Format: A 60-minute case-based learning experience held twice a month. Sessions included:
  - Learners presenting cases from their own practices
  - Followed by group discussion and recommendations for treatment
  - A short 15-minute educational talk on a subject related to home dialysis presented by a SME

NATIONAL KIDNEY FOUNDATION®

Project ECHO®

# Home Dialysis ECHO Hub Committee

***Christopher Chan, MD – Chair***
University Health Network
Toronto, ON, Canada

***Nancy Pierce, RN***
Elliston, MT

***Rajnish Mehrotra, MD, MS***
University of Washington
Seattle, WA

***Matthew Rivara, MD***
University of Washington
Seattle, WA

***Karen Crampton, LMSW***
University of Michigan
Ann Arbor, MI

***Danilo Concepcion, CBNT, CCHT-A***
St. Joseph Hospital
Orange, CA

***Gary Moore – Patient***
Anchorage, AK

***Katy Wilkens, RD***
Northwest Kidney Centers
Seattle, WA

***Renin Cassidy, MEd, RD***
Northwest Kidney Centers
Seattle, WA

Comagine Health

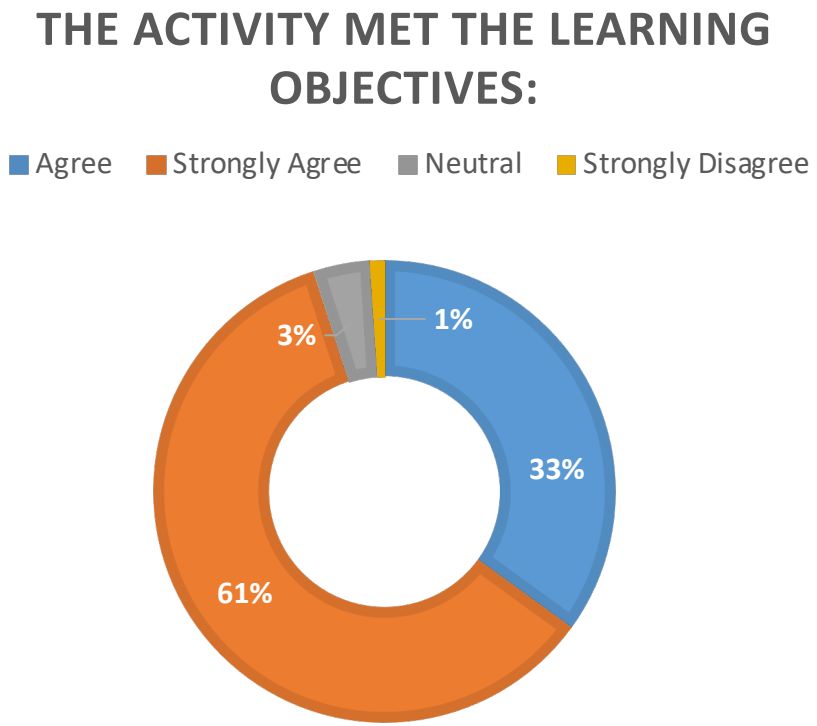
| Session Date | Topic (Attendance) |
|---|---|
| March 11, 2021 | How to Establish a Culture of Promoting Home Dialysis (33) |
| March 25, 2021 | Assumptions About Barriers to PD (37) |
| April 22, 2021 | Modality Education (30) |
| May 6, 2021 | Infection Prevention (23) |
| May 20, 2021 | Assessment by the Interprofessional Team (32) |
| June 3, 2021 | Psychosocial Adjustment/Adapting (38) |
| June 17, 2021 | Best Practice Training Techniques for Successful Home Dialysis (35) |
| July 1, 2021 | Ingredients for a Successful Home Dialysis Team (31) |
| July 15, 2021 | Clinical Strategies to Help Patients Feel Comfortable Performing Dialysis at Home (19) |
| July 29, 2021 | PD Catheter Placement/Growing Relationship with PD Catheter Surgeons (20) |

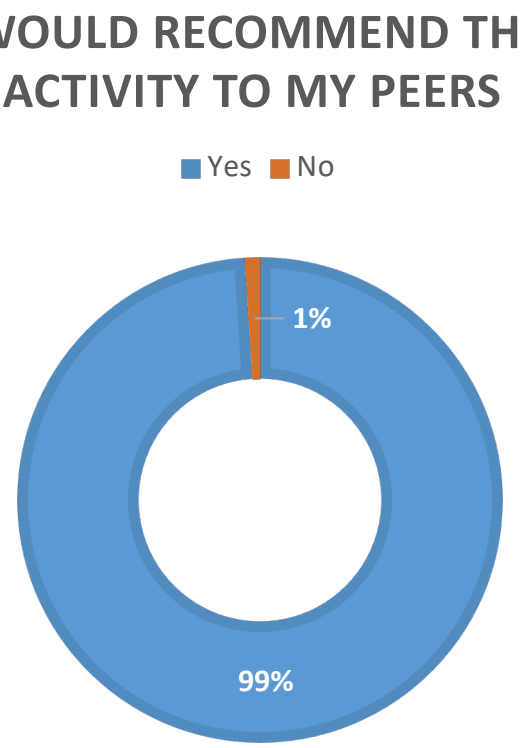
| Session Date | Topic (Attendance) |
|---|---|
| August 12, 2021 | Involving the Family/Support People in Training and Follow Up (32) |
| August 26, 2021 | Hernias and Leaks in Peritoneal Dialysis (15) |
| September 9, 2021 | Transitional Units (21) |
| November 18, 2021 | Nutrition and Home Dialysis (34) |
| December 3, 2021 | Home Hemodialysis Platforms (22) |
| December 16, 2021 | Troubleshooting the PD Prescription (22) |
| February 10, 2022 | Improvement pf Technique Survival (21) |
| On Demand | Technological Safety |
| On Demand | Co-Management with the Patient |
| On Demand | Acute PD, Urgent Start PD |

108 healthcare workers from 19 facilities registered for our home dialysis ECHO project. The registrants represented a diverse background (including: dietitian [n = 15], facility administrator [n = 20], nurse [n=36] and social worker [n=18]).

# Project Echo: Home Dialysis

## Sessions Summary Evaluation

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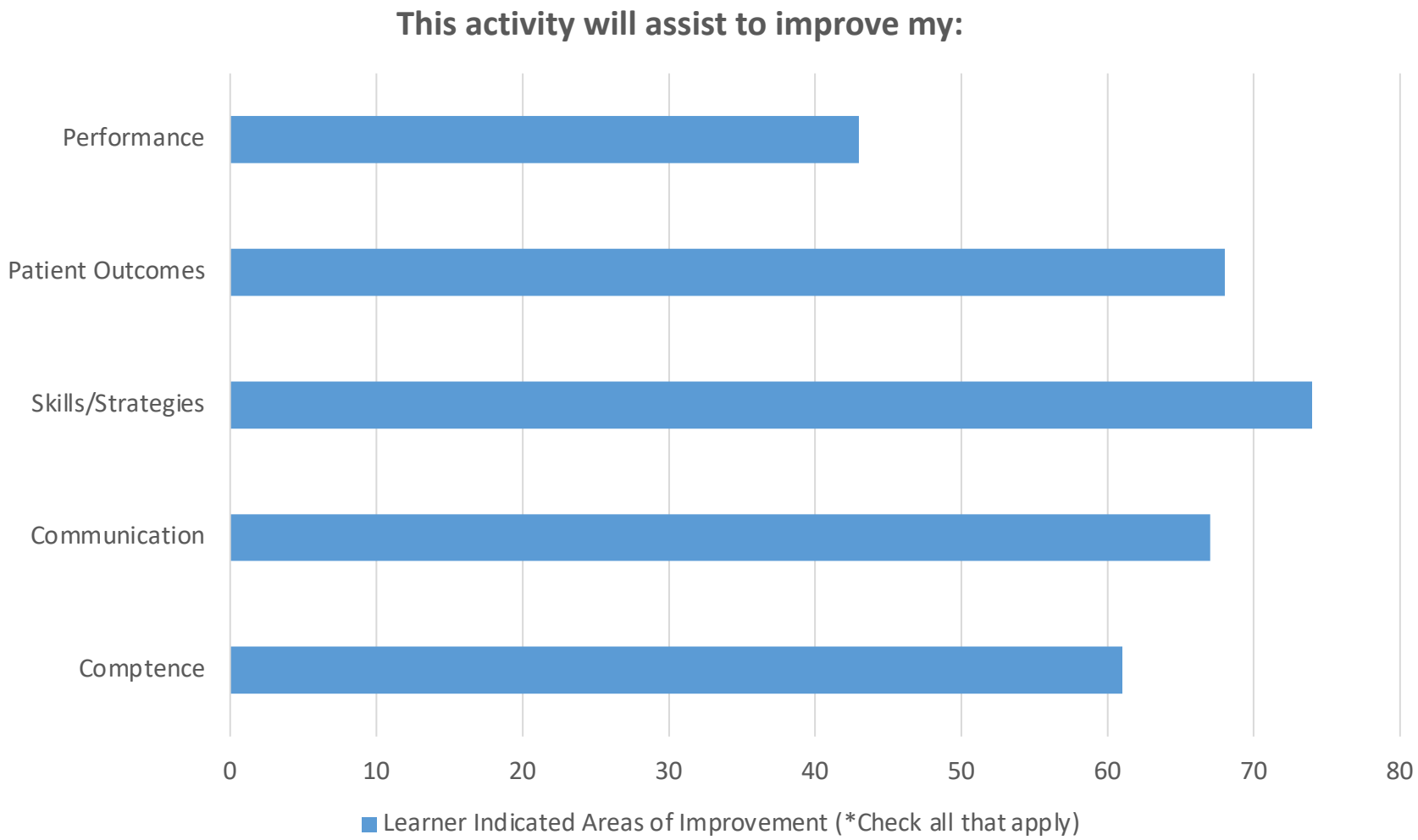
# Project Echo: Home Dialysis

## Sessions Summary Evaluation

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# Project Echo: Home Dialysis

## Sessions Summary Evaluation


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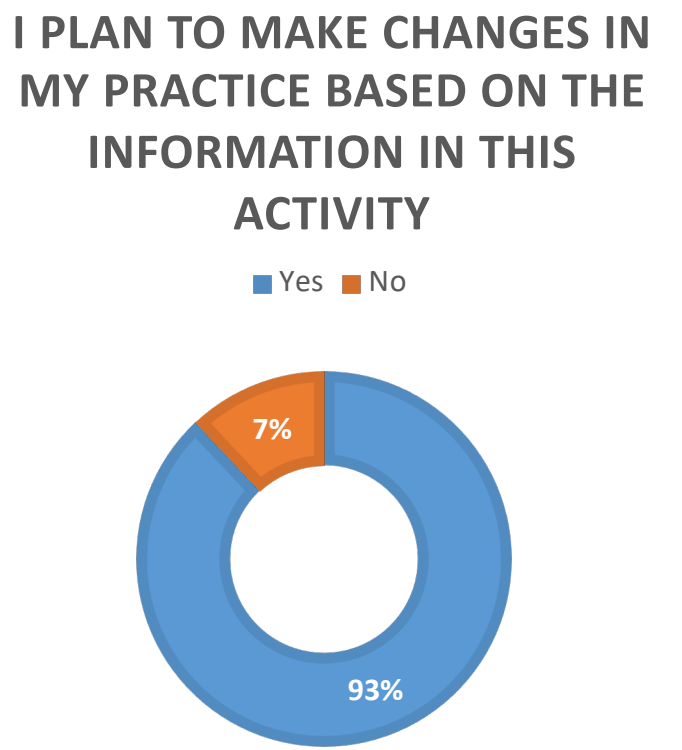
# Project Echo: Home Dialysis
## Sessions Summary Evaluation



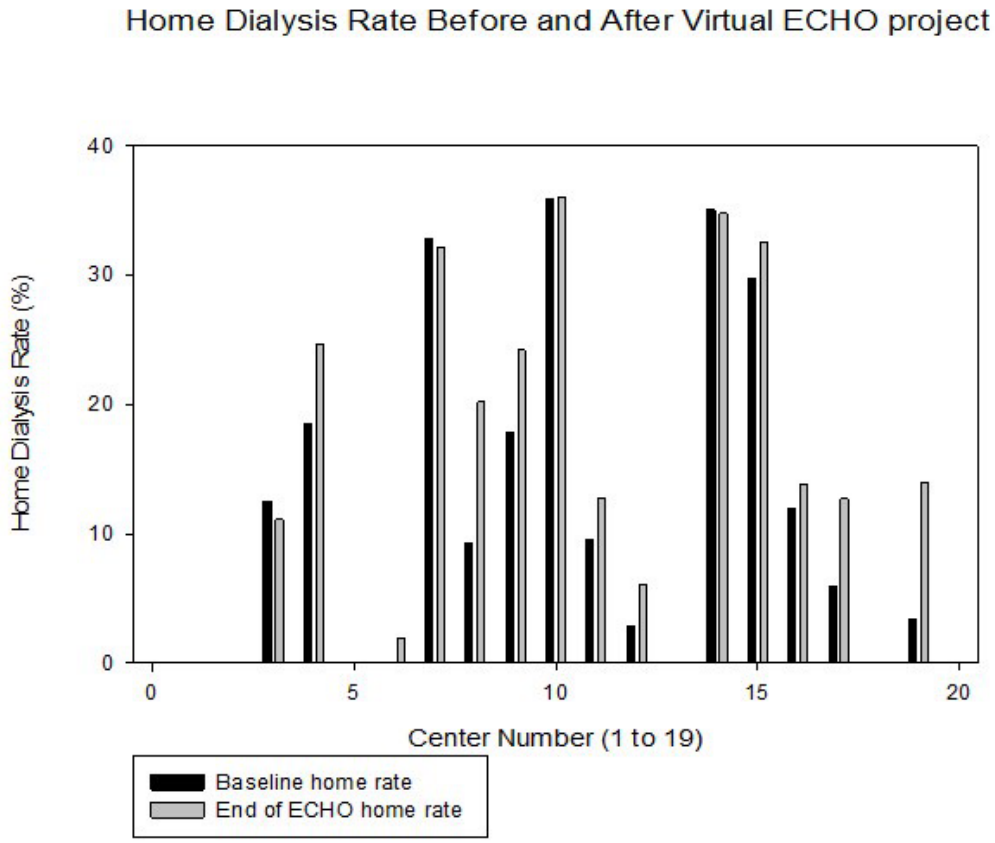

| Planned Changes Include: | |
|---|---|
| Modify my approach to treatment, referral or co-management | 47% |
| Modify elements of staff training or treatment protocols in my practices | 27% |
| Utilize alternative communication methodologies with my patients and families | 33% |
| Modify my patient education information/materials | 46% |
| Other<br>-Surgeon Education<br>-Schedule time during IDT to discuss bariatric surgery as an option for PD patient<br>-Discuss flexibility of home treatments<br>-Approaching education from a new angle | 3% |

*Question was a “check all that apply”, allowing learners to select multiple answers

Comagine Health

# Project Echo: Home Dialysis
## Sessions Summary Evaluation

At baseline, the participating centers' median home dialysis rate was 9.28% (0.00 – 18.52%) [25-75%] which increased to 12.8% (0.00 – 24.6%) [Wilcoxon Signed Rank Test, p = 0.004] after the program.

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# Project Echo: Home Dialysis
## What's Next?

- Continue to foster collaborative relationship between Comagine Health and the National Kidney Foundation
- Grant proposal submitted in May 2022 in support of program continuation and expansion
- Prepare Home Dialysis Project Echo expansion to begin Fall 2023
  - 3 ESRD networks (5, 11 & 16)
  - 15 facilities each

Comagine Health

# We borrow some thoughts from medical education

- Undergraduate medical education → assurance of training

**Using modified Direct Observation of Procedural Skills (DOPS) to assess undergraduate medical students**

AREZOU FARAJPOUR[1], MITRA AMINI[2*], ELHAM PISHBIN[3], ZAHRA MOSTAFAVIAN[4], SOMAYEH AKBARI FARMAD[1]

**Table 1:** Cronbach's Alpha of check lists

| Check list | Cronbach's Alpha | Numbers of Items |
|---|---|---|
| ABG sampling | 0.899 | 27 |
| NGT inserting | 0.887 | 21 |
| Urine catheterization | 0.916 | 24 |
| Taking IV line | 0.888 | 20 |
| Taking ECG | 0.907 | 22 |
| Dressing | 0.793 | 15 |
| Suturing | 0.746 | 19 |

# The Effect of Interim Assessment on Home Hemodialysis Patient Readiness

**Nalinee Saiprasertkit, MD, Christopher Chan, MD**
University of Toronto, Toronto, Canada

## Background

- Teaching strategies to ensure the patients' ability to administer their own therapies safely without supervision is fundamental to the success of HHD.
- Several studies showed mid-training assessments followed by final assessment at completion of training improved learning outcomes.
- The aim of this study is to determine the impact of interim assessments on readiness of HHD patients transitioning home.

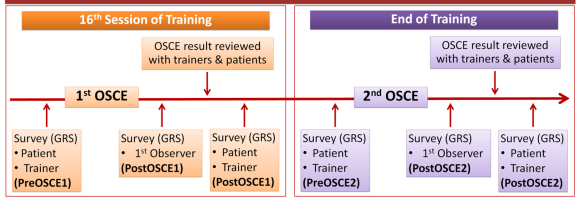
## Methods

- Prospective feasibility study examining consecutive end stage renal disease patient or caregiver who were undergoing HHD training between Sep 1, 2017 to Sep 30, 2018.
- All eligible candidates were observed for hemodialysis performance skills and basic hemodialysis concept by an independent HHD nurse (observer) after 16 sessions of HHD training *and* at the end of training.
- The observer provided feed back to the patient/caregiver (trainees) and their primary nurses (trainers).
- The confidence in performing dialysis was assessed by global rating scale (GRS) in HHD candidates and the training nurses before and after every assessment (PreOSCE & PostOSCE) .

## Results

- 19 candidates were trained for HHD; 14 were eligible for the study, 3 was transferred to conventional HD, 2 were admitted to hospital during training.
- Of 14 candidates; 12 were ESRD patients, 2 were ESRD patients' caregivers. Mean age 47.3 (24-73) years, Male 64 %, Asian 54%, Graduated from college or higher education 81.8%, Using central venous catheter 50%.
- The OSCE demonstrated a major pitfall in one patient during the 1st OSCE which was corrected before the 2nd OSCE and subsequently transitioned home.

**Study Protocol**



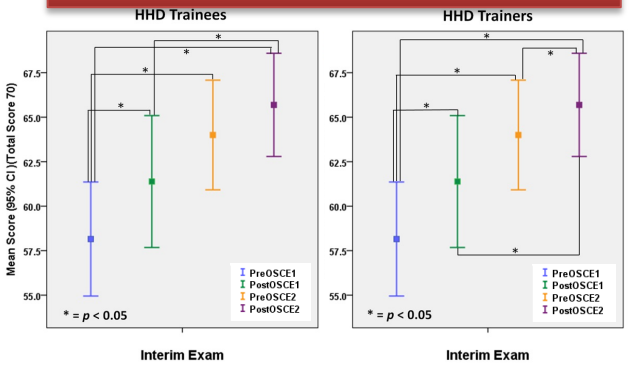

**Global Rating Scale (GRS) (Total score = 70)**

| | Trainees | Trainers | Observers | *p* |
|---|---|---|---|---|
| PreOSCE1 | 58±5.1 | 53.0±6.6 | N/A | 0.035 |
| PostOSCE1 | 60.7±6.4 | 55.5±4.3 | 55.5±6.4 | 0.08 |
| PreOSCE2 | 63.3±5.6 | 59.4±7.5 | N/A | 0.13 |
| PostOSCE2 | 65.7±4.8 | 62.9±8.0 | 61.3±6.8 | 0.73 |

## Conclusion

- Interim observed evaluation is a feasible strategy to enhance patient and nursing 's ability to train a complex medical procedure.
- Interim assessment improved both trainees and trainers' confidence levels before transitioning home.
- Prospective evaluation of the clinical impact of interim training evaluation on adverse outcomes warrant further evaluation.

**Study Results**



# What about other methods of training / testing?


ORIGINAL ARTICLE

# The impact of simulation-based teaching on home hemodialysis patient training

Doris T. Chan[1], Rose Faratro[2], and Christopher T. Chan[2]

[1]Department of Renal Medicine, Sir Charles Gairdner Hospital, Nedlands, Australia, and [2]Division of Nephrology, Department of Medicine, University Health Network, Toronto, Ontario, Canada

Correspondence to: Christopher T. Chan; E-mail: christopher.chan@uhn.ca

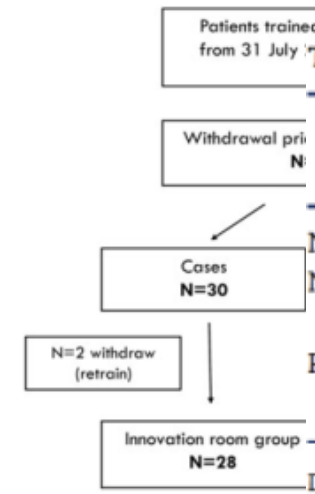



Fig. 1. Patient flow chart.

Table 1. Patient characteristics

Table 2. Patient comorbidities and social situations

Table 3. Effect of exposure to the innovation room on outcomes

| | Case ($n = 28$) | Control ($n = 21$) | P-value |
|---|---|---|---|
| Number of home visits ($n$) | 1.0 (1.0) | 2.0 (2.0) | 0.058 |
| Number of retraining sessions ($n$) | 0.0 (1.8) | 0.0 (4.5) | 0.84 |
| Proportion with technique failure, $n$ (%) | 0 (0) | 1 (3.6) | 0.54 |

Data presented as median (IQR) and comparison by Mann–Whitney for continuous variables. For categorical variables, data is presented as numbers (percentage) and comparison by Chi-squared or Fisher exact test.

| rol 1) | P-value |
|---|---|
| 8.6.0) | 0.62 |
| 4.3) | 0.20 |
| .8) | 0.70 |
| 5.0) | 0.30 |
| 1.4) | 0.08 |
| 8.6) | |
| ) | |
| .5) | 0.80 |
| 4.3) | 0.53 |
| 1.0) | 0.34 |
| 2.9) | 0.42 |
| .5) | 0.64 |

Mann–Whitney for ented as numbers test.

CHD, coronary heart disease; COAD, chronic obstructive airways disease.

CKJ 2015

# Patient and Technique Survival among a Canadian Multicenter Nocturnal Home Hemodialysis Cohort

Robert P. Pauly,[*†] Katerina Maximova,[†‡] Jennifer Coppens,[†] Reem A. Asad,[§] Andreas Pierratos,[‖] Paul Komenda,[¶] Michael Copland,[**††] Gihad E. Nesrallah,[‖‡‡] Adeera Levin,[**††] Anne Chery,[§§] and Christopher T. Chan,[‖‖]
on behalf of the CAN-SLEEP Collaborative Group

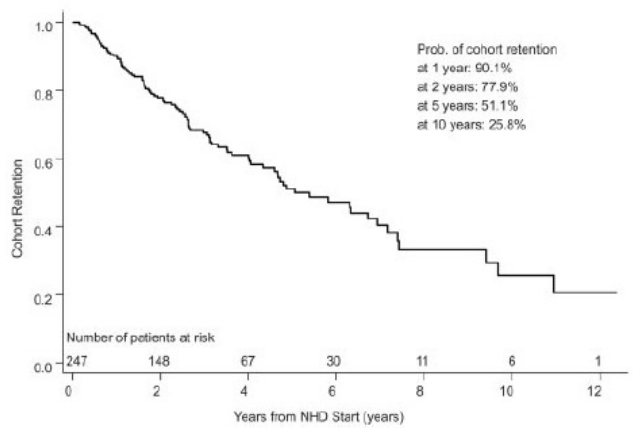



*Figure 1.* Overall NHD cohort retention censored only at time of study termination.

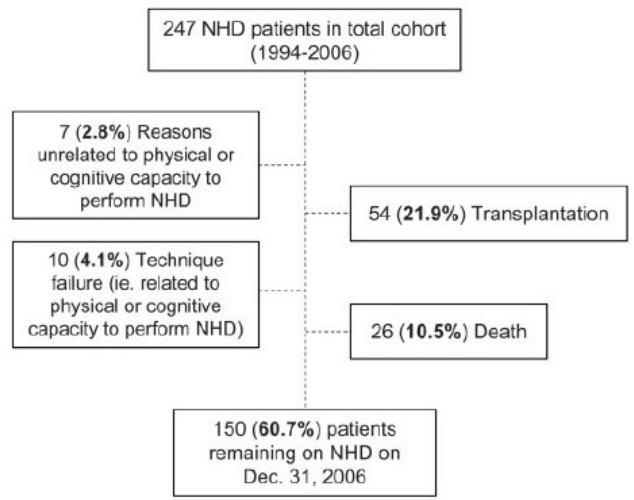



*Figure 2.* Patient disposition of the multicenter CAN-SLEEP NHD cohort from 1993 to year-end 2006.

# What is your technique survival?

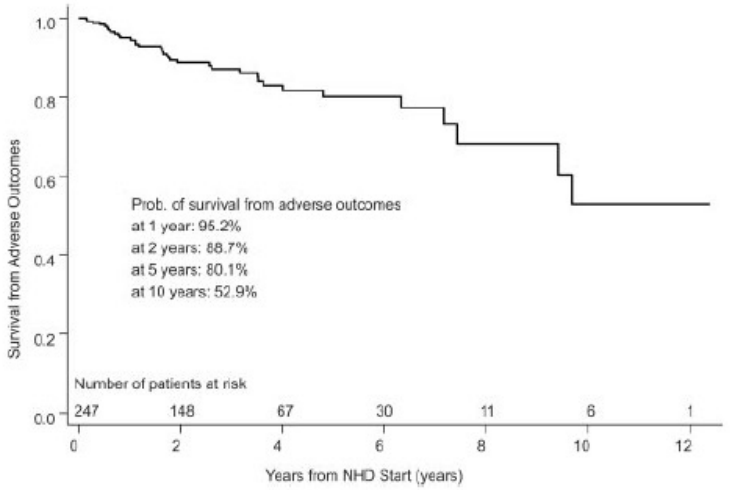
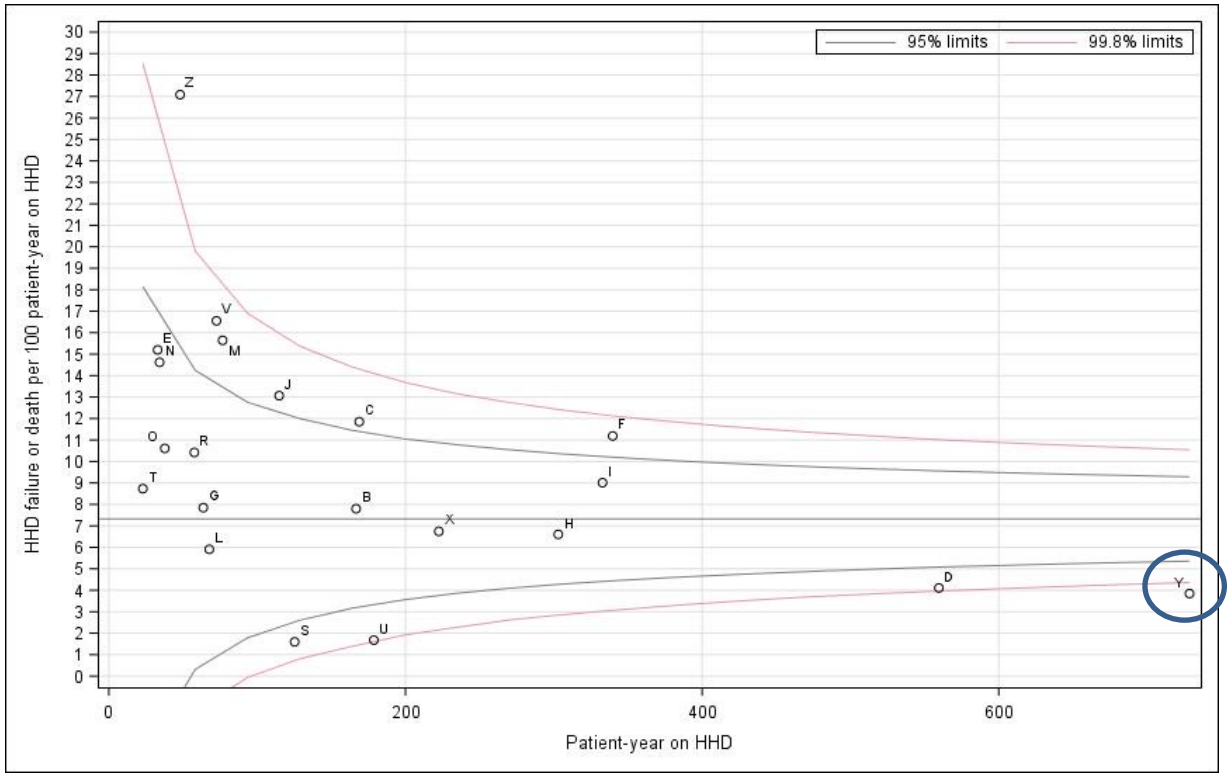



*Figure 3.* Event-free survival from adverse outcomes (composite of death and technique failure; $n = 36$ events) among the NHD cohort with analysis censored for transplantation and cohort dropout unrelated to technique failure.

*Table 2.* Adverse NHD program exits (death and technique failure; $n = 36$ events in 247 patients) according to center

| Center | HR | 95% CI | *P* |
|---|---|---|---|
| 1 | 1.00 | Reference | |
| 2 | 2.49 | 1.07 to 5.79 | 0.03 |
| 3 | 1.06 | 0.22 to 5.10 | 0.95 |

CI, confidence interval; HR, hazard ratio.


95% limits
99.8% limits
HHD failure or death per 100 patient-year on HHD
Patient-year on HHD
0
200
400
600
Z
V
E
N
M
J
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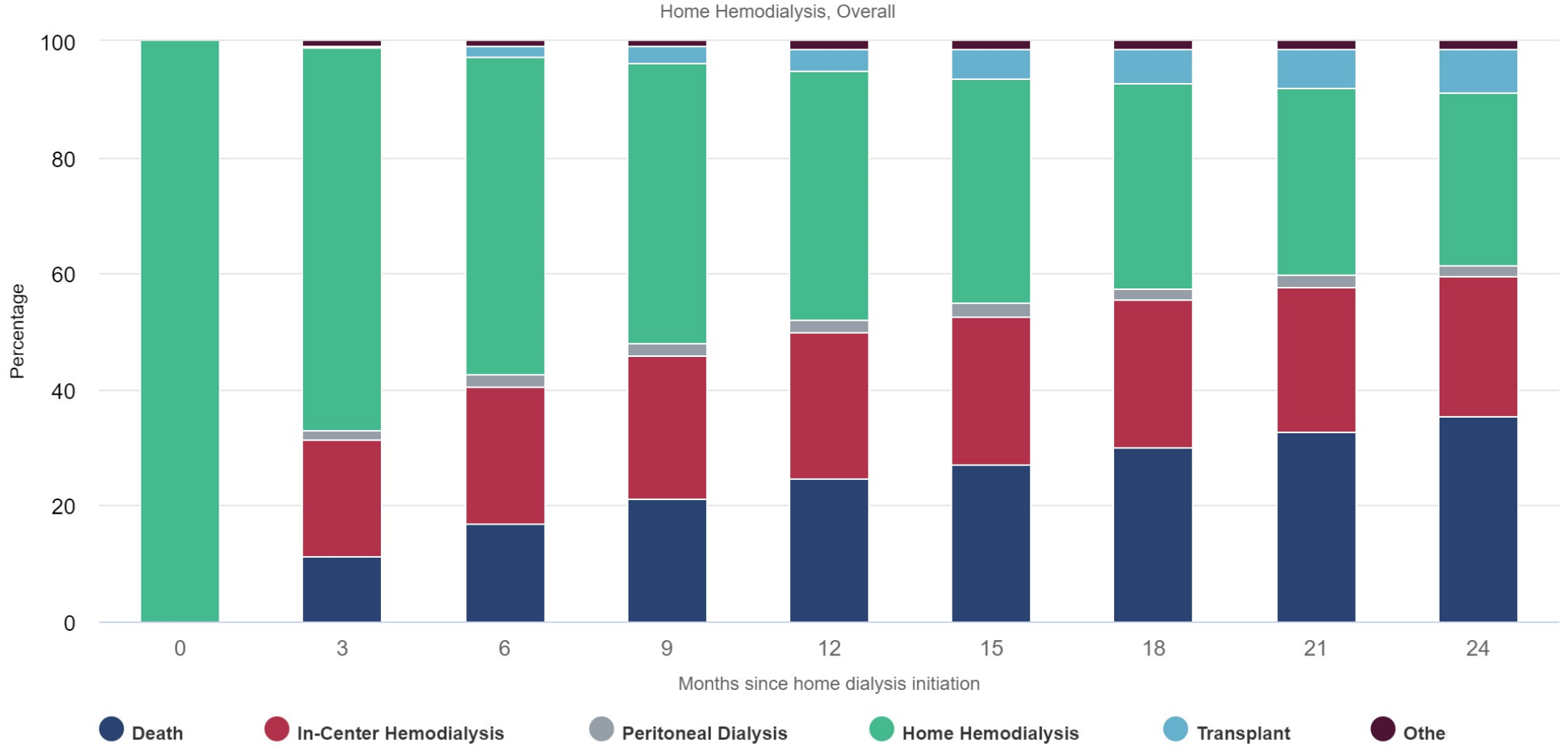
# Attrition is a major problem

Figure 2.19 Outcomes over the 24 months following home dialysis initiation in 2017-2018




Data Source: 2022 United States Renal Data System Annual Data Report

# Summary

- Education Awareness is critical for home dialysis
  - Patients
  - Nephrologists

- Education → more than 1 episode
  - There is a need for mentorship to build capacity
  - Understanding training (input) and technique (attrition)