


# 해외 재택 투석 현황

(일본, 미국을 중심으로)

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범일 연세내과 이동형  
대한신장학회 산하 재택투석연구회



# 대한민국 여행 투석의 시간들

## 大韓民國の旅行透析の時間

범일 연세내과  
원장 이 동 형

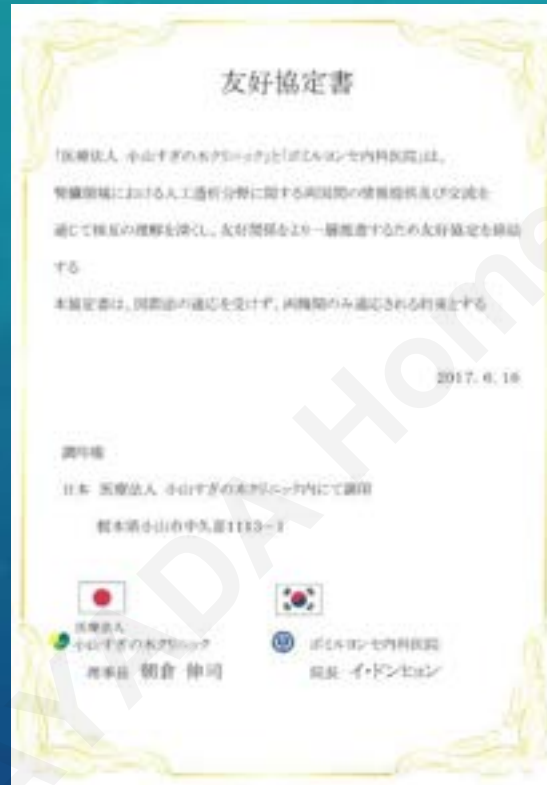
# 여행 투석의 시작 – JSDT 2016 OSAKA (2016년 6월)



# SUGINOKI CLINIC의 부산 방문 (2016년 7월)



# 우호 협정 체결 (2017년 6월)



# 2019년 6월까지의 성과

## 지금까지의 실적

환자 국적	여행지	인원
일본	대만	1
일본	한국	2
일본	중국	1
일본	베트남	1
한국	일본	2
한국	베트남	1
대만	일본	5
대만	한국	10

그리고 WTDM의 탄생...

세계여행투석 의료 네트워크



**World Travel Dialysis Medical Network**

# Travel Dialysis in Korea, Japan and Taiwan

(PO - 1099)

Dong Hyung Lee<sup>1</sup>, Shinji Asakura<sup>2</sup>, Kaga Makoto<sup>2</sup>,  
Chyi-Ran Lee<sup>3</sup>, Hankyu Lee<sup>4</sup>

- <sup>1</sup>Department of Internal Medicine-Nephrology, Beomil Yonsei Clinic, Korea, Republic of
- <sup>2</sup>Department of Internal Medicine-Nephrology, Suginoki Clinic, Japan
- <sup>3</sup>Department of Marketing, Taiwan Association for Dialysis Patients' Quality of life, Taiwan
- <sup>4</sup>Department of Internal Medicine-Nephrology, Lee Hankyu Clinic, Dialysis Center, Korea, Republic of

医療法人 小山すずの木クリニック ...  
2020年 9月 10日

2020.9.10  
「韓国腎臓学会(KSN)2020」

韓国腎臓学会が9/24~9/27で開催されます。韓国や台湾と協力して、旅行透析事業を展開させていただいております。この度、当学会において共同者として名前を掲載していただきました。

コロナ禍で渡航を兼ねる海外旅行透析は、現状ストップしている状況ではありますが、平常の生活を取り戻せば、再開してより良い旅行透析環境の提供を目指して参ります。

KSN2020으로 WTDN(World Travel Dialysis Network)이 소개됩니다. 협력 병원이 늘어나는 것을 희망하고 있습니다. Dr.Dong Hyung Lee, Dr.Hankyu Lee 협력에 대단히 감사합니다.

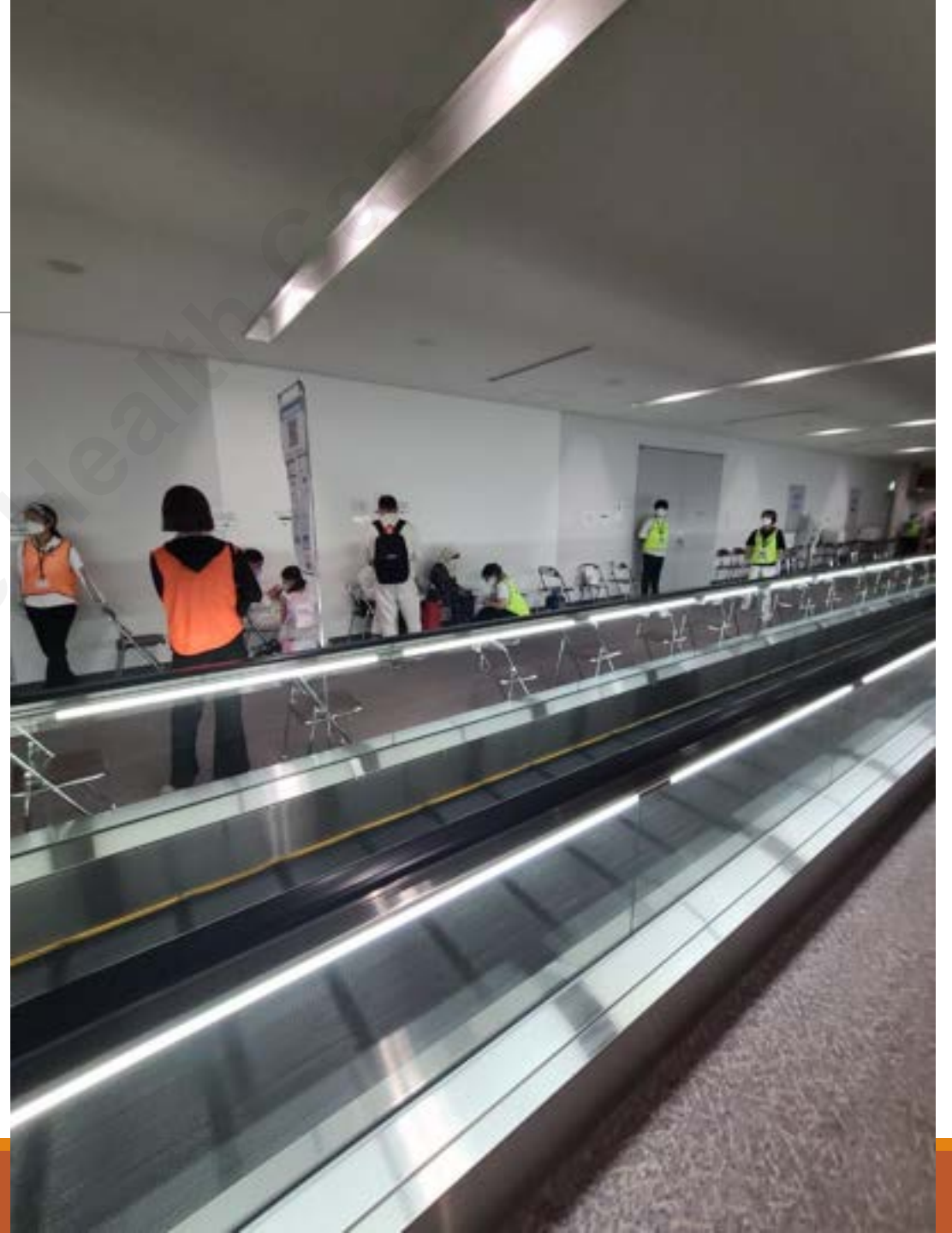
在KSN2020中介绍WTDN(World Travel Dialysis Network), 希望合作醫院增加, 非常感謝Chyi-Ran Lee等臺灣同事們的協助。

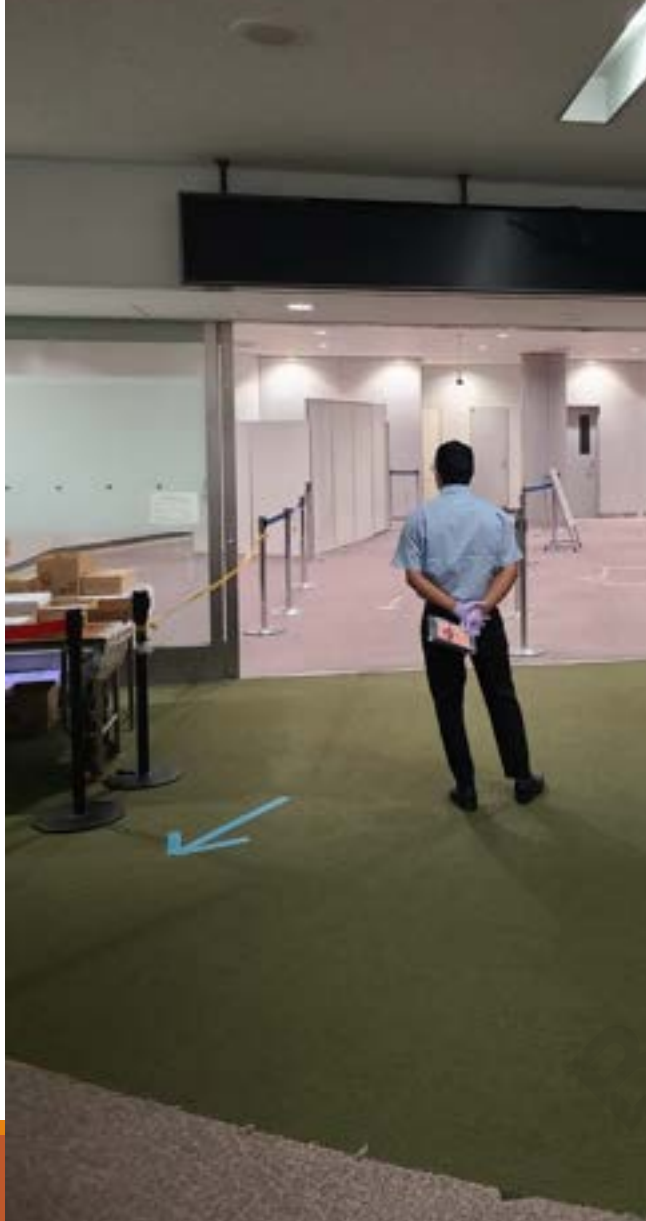
WTDN (World Travel Dialysis Network) will be introduced on KSN2020. I hope there will be more cooperative hospitals, cross-border  
Dear Dr. Dong Young Lee,  
Dear Dr. Hankyu Lee,  
Dear Chyi-Ran Lee,  
I am especially grateful to the three of them. 건단여 보기

회원님, 加贊誠, 외 3명 공유 1회

최고예요 댓글 달기 공유하기











医療法人社団 聖医会

## せいikaiメディカルクリニック -OYAMA-

내과, 외과, 투석 혈관 접근 클리닉

70 투석 침대 온라인 호환

도치기현 시모노시역 히가시 5-13-18

전화 0285-44-8345



医療法人社団 聖医会

## せいikaiメディカルクリニック -NASU-

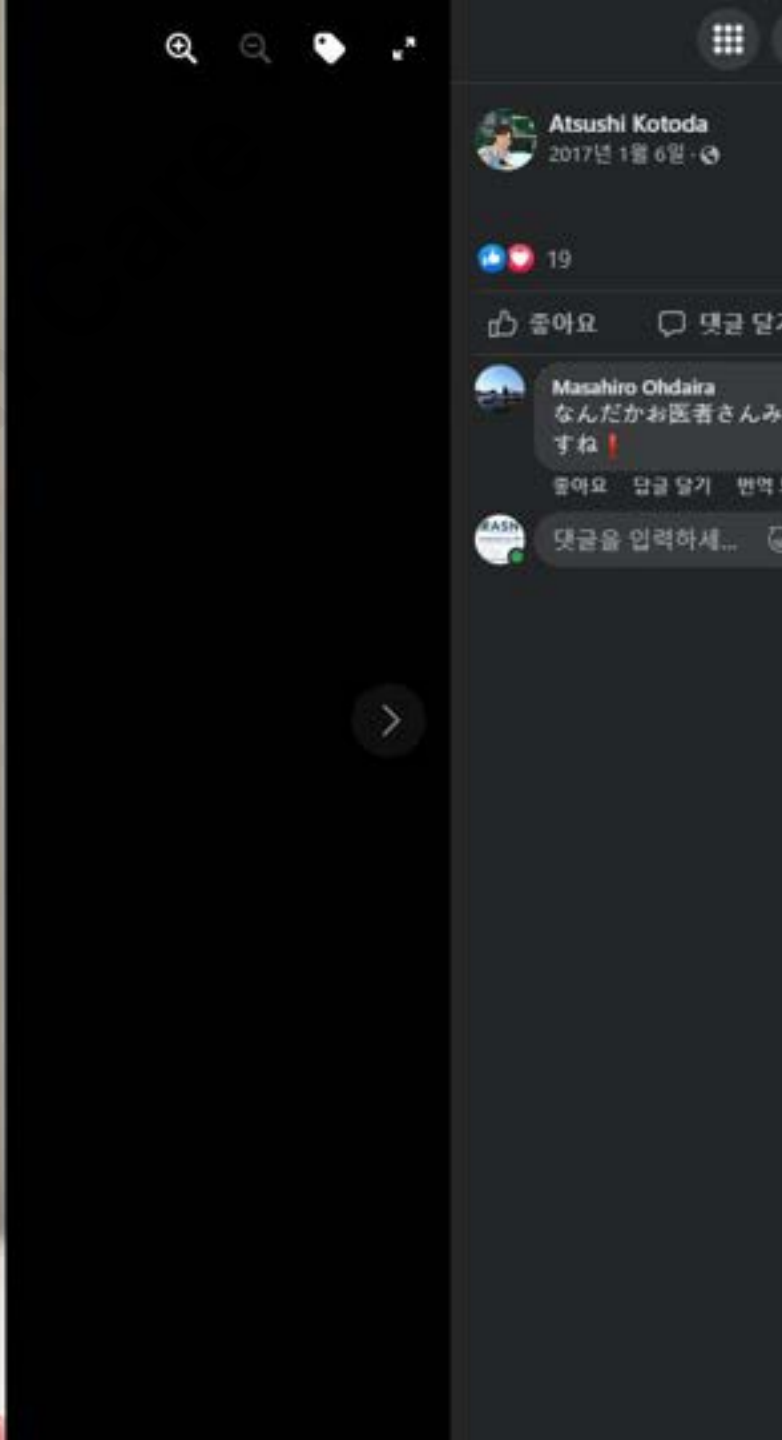
내과, 심장학 및 투석 혈관 접근 클리닉

60 투석 침대 온라인 호환

도치기현 오타와라시 마키시마 200-8

전화 0287-24-7070





관리자입니다. >

> 의료법인, 성의학회, 의료단체

세이카이 의료 클리닉 오야마 >

세이카이 의료 클리닉 -NASU- >

> 선트 관련

선트 수술에 대하여 >

경피 혈관 확장(VAVT)에 관하여 >

장기 내주 카테터에 대해서 >

치료 성과 >

> 신장 대체 요법

투석 >

가정 의료 가정 투석 복막 투석 >

복막 투석 >

> 홍보

학술 학회 세미나 활동 >

유튜브 동영상 배포 >

집에서 투석

透析の  
人生  
思っ  
んか？

일본의 가정 혈 HD 환자 수는 1 QOL 및 생활 여 로 예상됩니다. HHD의 필수 요 널리 퍼뜨릴 필 정 투석 환자에 아납니다. 집에

가정 투석

가장 큰 장점으 에 많은 투석을 로 이들에 한 번 적인 투석이라. 가와 감소가 즐 또한 환자 자신

自己穿刺は大変では？

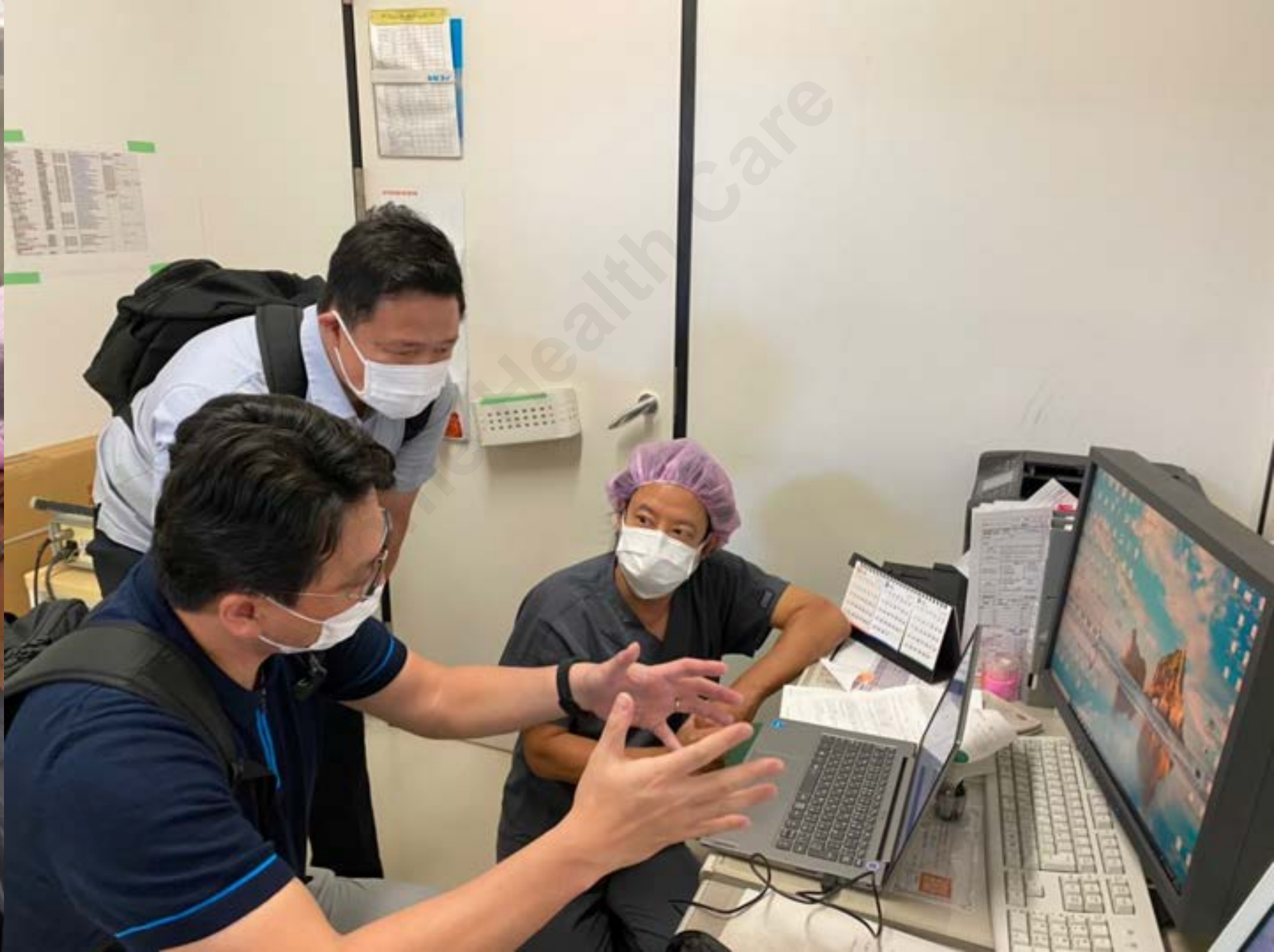


→ 우리 그룹에서는 카테터를 사용하여 가정 투석을 수행 할 수도 있습니다.

スプリット  
ストリーム  
カテーテル  
を使用して  
のHHD

- スプリットストリームカテーテルは、カテーテル挿入時の痛みの軽減に効果的であり、挿入後にはインフルエンザカテーテルより痛み・腫れがよりスムーズになります。(挿入時の痛みは軽減されます。)
- カテーテルはあらかじめシリコン製で皮膚に対してはアレルギー反応のリスクを軽減します。

가정 투석은 당신의 삶을 바꿀 수 있습니다. 환자에 관심이 있으시면 가정 투석을 담당하는 임상 엔지니어 인 Chika Kazama에게 문의하십시오.







# Home dialysis visit video













第24回 日本在宅血液透析学会  
第17回 長時間透析研究会

山本智之 先生  
カズ 先生

参加証明書 No.307

第24回日本在宅血液透析学会・  
第17回長時間透析研究会に  
参加されたことを証明いたします。  
2022年11月12日・13日

第24回日本在宅血液透析学会  
第17回長時間透析研究会  
大倉 山川 智之

第24回 日本在宅血液透析学会  
第17回 長時間透析研究会

プログラム・抄録集

テーマ  
LINKs with the society  
～社会とつながる透析を目指して～

2022年  
日程 11月12日<sup>土</sup>・13日<sup>日</sup>

会場 大阪国際交流センター  
(大阪市天王寺区上本町8丁目2-6)

大会長 山川 智之  
(医療法人仁真会白鷺病院)

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**日本在宅血液透析学会参加**  
 韓国を代表する腎臓領域を牽引する4人の医師集団  
 2022年発足 **4人全員が韓国の有名大学病院教授です**  
 『韓国在宅血液透析研究会』学術理事の先生たち  
 ※会場にいますので、気軽に話しかけてくださいぜひ交流をしましょう！  
 日韓の在宅透析学会が協力し合い、アジアの在宅透析の発展を願います







ガン先生      ユ先生      イ先生      キム先生



境の影響を受け、内在する問題点や  
 液透析を安全に推進していくためには  
 することが必要である。  
 知ってきており、患者数も漸増して



韓国の先生たちとWEBミーティング

次演者







# Home Hemodialysis : clinical benefits, risks and target populations

Home hemodialysis in Korea:  
Can we overcome the barriers?

Kyung Don Yoo , MD, PhD

2018.06.17. 경북대병원 연수강좌



**울산대학교병원**  
ULSAN UNIVERSITY HOSPITAL

**울산의대 울산대학교병원**

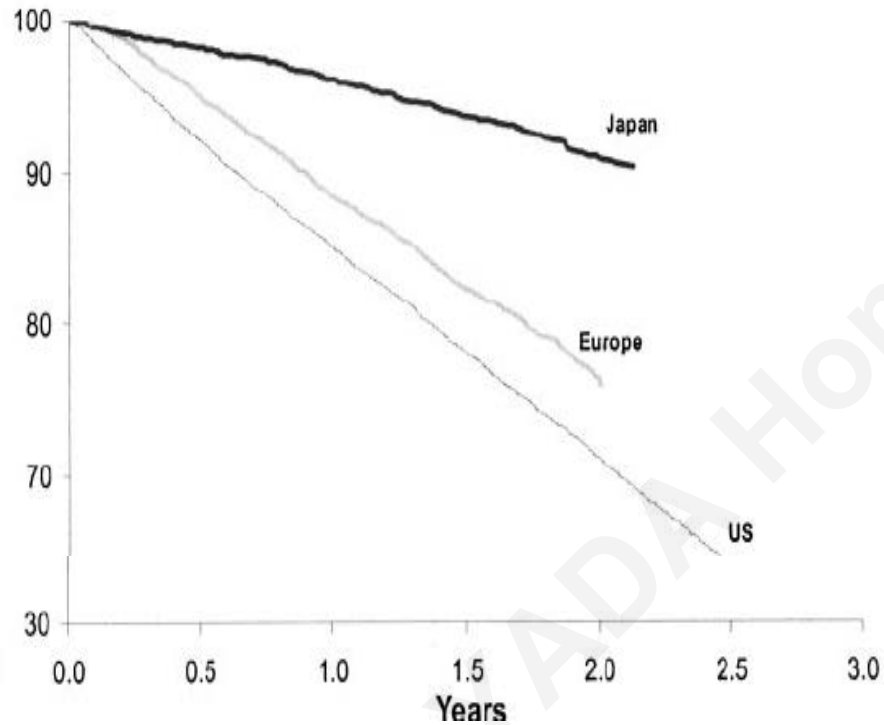
**신장내과 유경돈**

대한신장학회 재난대응위원회 간사, 홍보위원회 위원

노인신장학연구회 연구이사, 재택투석연구회 수련교육이사

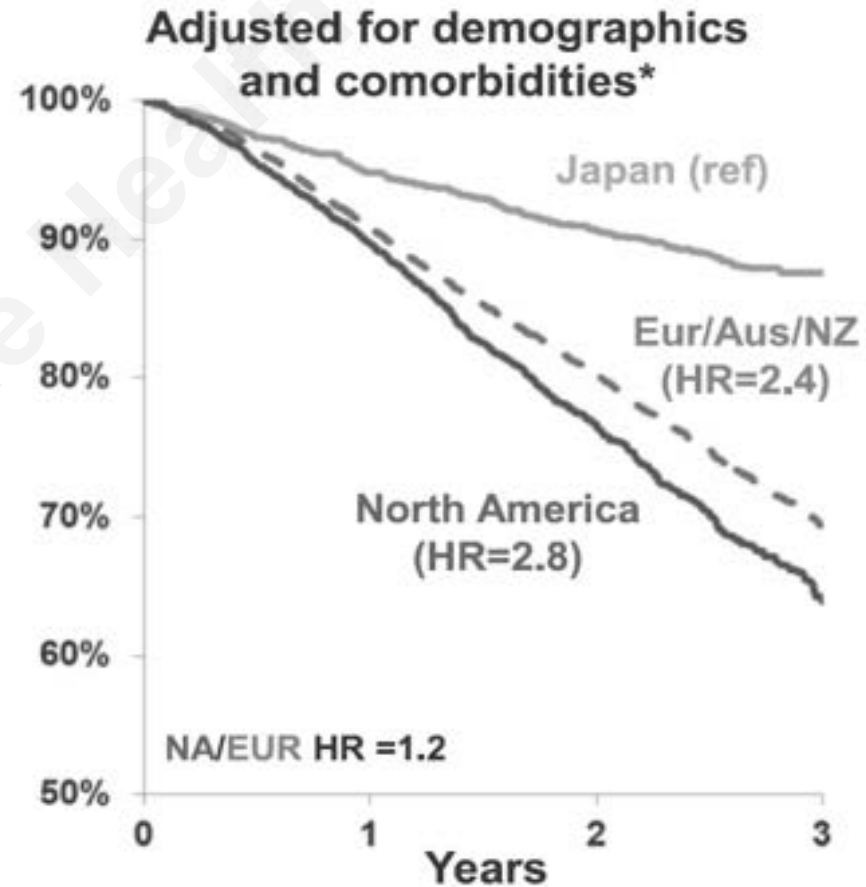
# 유럽, 일본에 비해 높은 북미환자들의 사망율

DOPPS 1



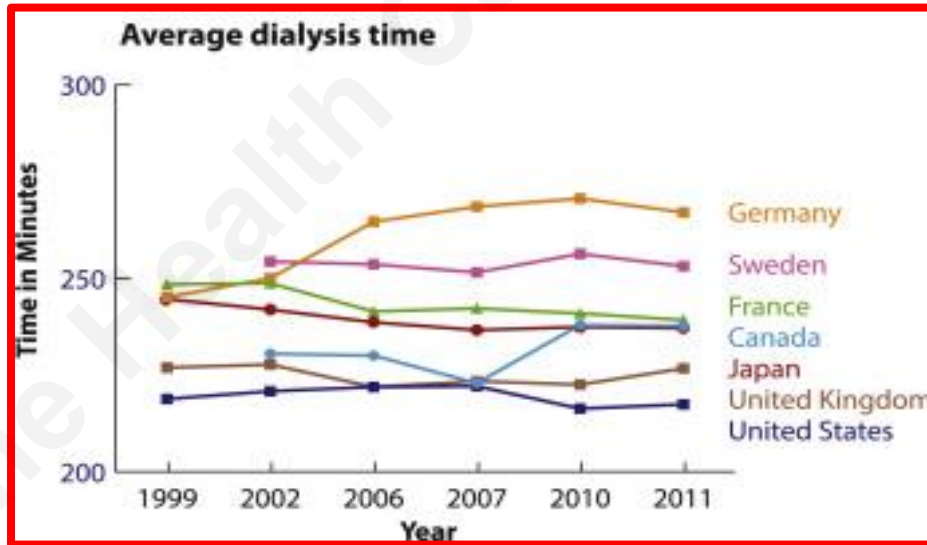
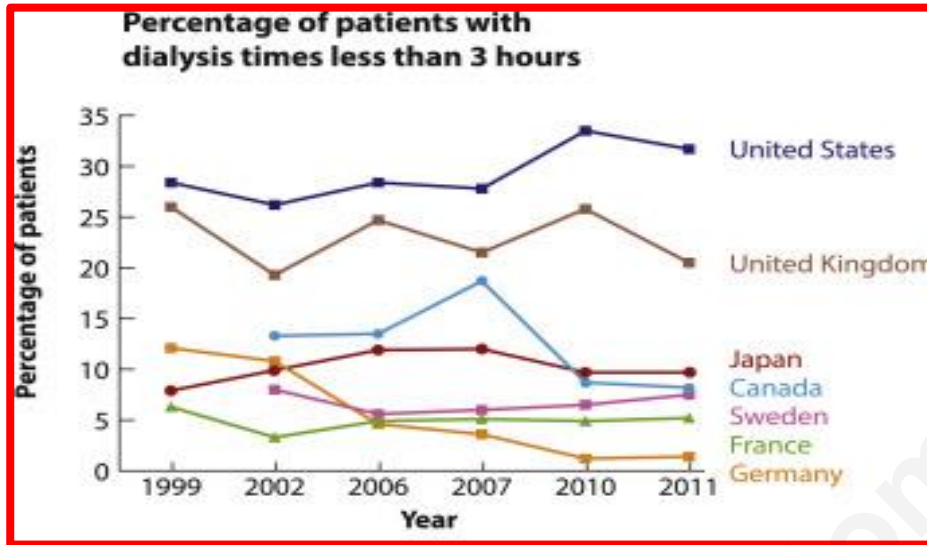
2003 JASN

DOPPS 3



2012 CJASN

# 미국 혈액투석 환자들의 짧은 투석 시간



- ✓ 미국투석환자는 투석시간이 매우 짧고, 실제로 최근까지도 30%의 환자들이 3시간 이하로 투석을 받고 있었음 → KDOQI Kt/V를 유지하기 위해서 필연적으로 BFR증가, UFR증가로 이어지게 됨

UFR Thresholds in Maintenance HD: NKF-KDOQI Controversies Report, 2016 AJKD

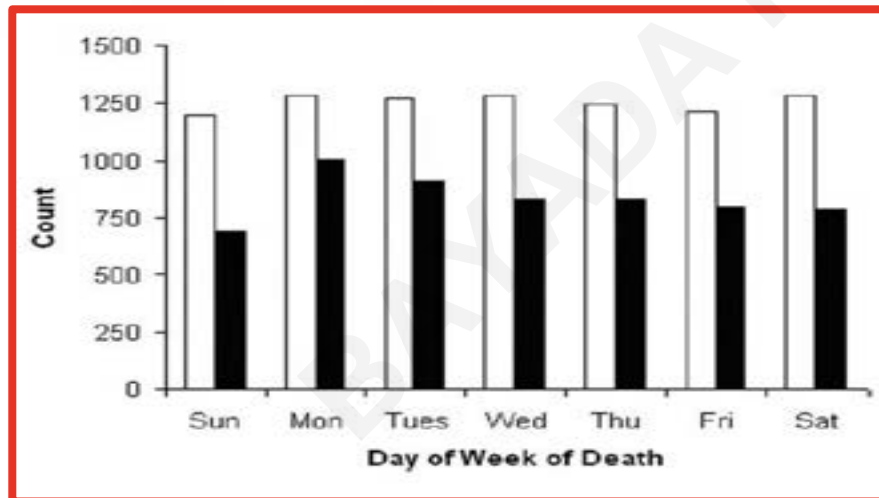
- ✓ IHD in the United States is very effective. Mean single-pool Kt/V is 1.6, and 97% of treatments deliver single-pool Kt/V  $\geq 1.2$  → contemporary IHD is equivalent to the high-dose, high-flux arm of the HEMO trial

# 혈액투석을 쉬는 날 ( 주말에 ) 높은 사망사건이 발생한다

**Table 1. (Continued.)**

Characteristic	Value	Median (Interquartile Range)
Length of dialysis session — min	217.2±33.5	213.0 (195.0–240.0)
Weight — kg		
Predialysis	81.0±22.9	77.3 (65.3–92.5)
Postdialysis	78.1±22.4	74.5 (62.7–74.5)
Interdialytic weight gain — %	3.8±3.0	3.6 (2.5–4.9)
Urea reduction ratio	0.72±0.08	0.73 (0.69–0.77)
Reported Kt/V <sup>†</sup>	1.69±12.62	1.60 (1.41–1.80)
Residual urine function used in the estimation of Kt/V — % of patients <sup>†</sup>	2.1	
Body-mass index <sup>‡</sup>	27.8±7.6	26.3 (22.7–31.2)
Serum albumin — g/dl	3.8±0.5	3.8 (3.5–4.1)
Hemoglobin — g/dl	12.0±1.5	12.0 (11.2–12.9)
Wait-listed for kidney transplant — % of patients	16.4	
Diabetes — % of patients	49.5	
Cardiovascular hospitalization in preceding 90 days — % of patients <sup>§</sup>	11.9	

## HHD환자와 PD환자에서는 이러한 현상이 관찰되지 않았다



N=14,636 / IC-HD 3/wk 9,503 / >3/wk 251 /HHD 573 / PD 4,298, ANZDATA

Daily variation in the pattern of cardiac death was observed in **HD pts with 3/week**, But not in PD, HHD and HD pts with more than 3/week

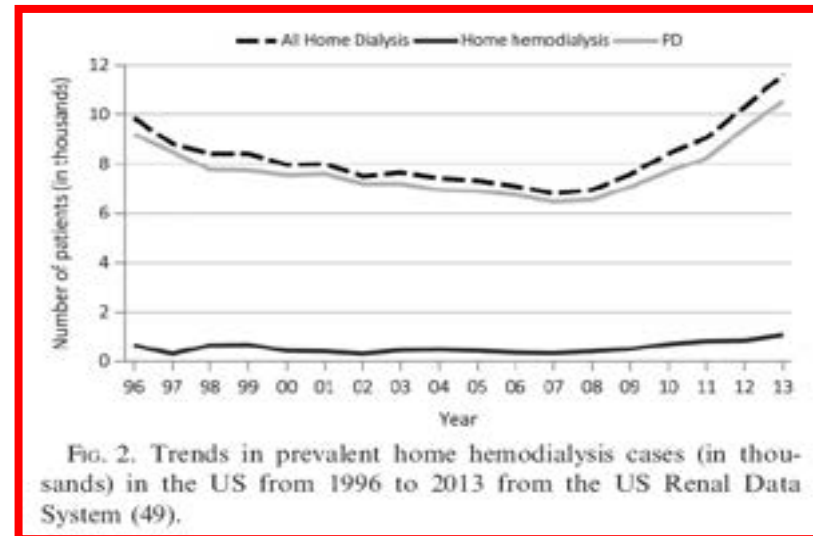


# History of HHD

- 1961: first clinic (Seattle)
- 1962-1971: “Life and Death” committees
- 1964: first home hemo
- 1970: 90% WA patients on home hemo
- 1973: Medicare covers ESRD on ICHD
- 1973-1980: home hemo declined from 40% to 4.6%
- Recently risen in US
  - 1481 at the end of 2004 → 4836 at the end of 2009
  - Periodicity of daily home hemodialysis(DHHD) may be efficacious
  - Increased attention to hygiene techniques for vascular access and equipment maintenance
  - modern renaissance began in [2005](#), when equipment that was designed for easy installation and use in the home was cleared by the FDA



Drake-Willock machine  
with Kiil dialyzer early 1960s



# Hemodialysis in the Home—13 Months' Experience

CONSTANTINE L. HAMPERS, M.D., and JOHN P. MERRILL, M.D., F.A.C.P.

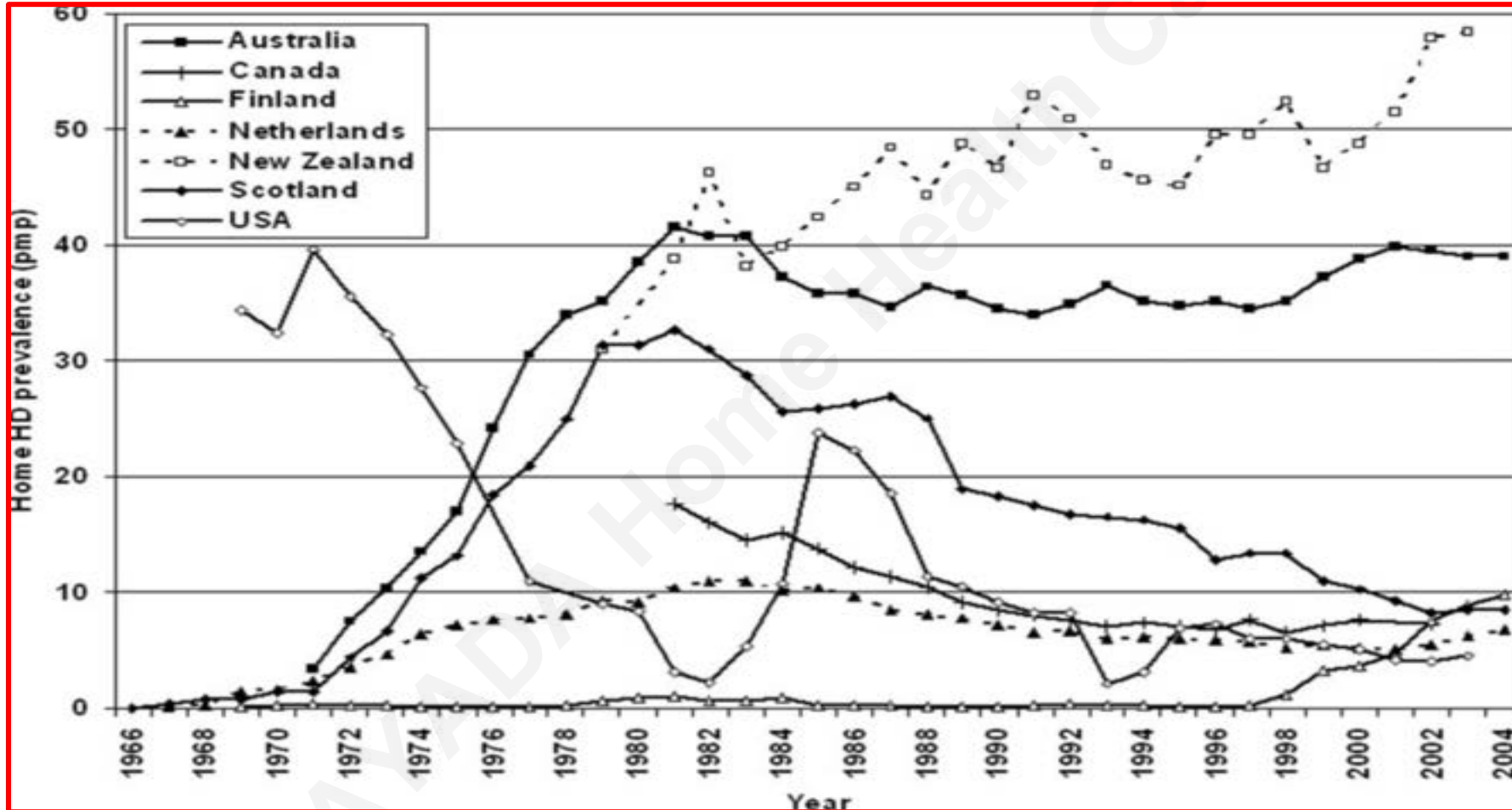
*Boston, Massachusetts*



TABLE 2. Cost of Home Dialysis

Expenses	Price	
	Per Dialysis	Per Year
Artificial kidney* and installation		\$1,700.00
Other permanent equipment		257.00
	Total	\$1,957.00
Additional operating expense:		
Using regular twin coil	\$75.11	\$7,842.64
Using "chronic" coil	\$46.41	\$4,826.64

# The prevalence of HHD in 7 OECD countries from 1966 to 2006



- In 1973, ~33% of all US HD pts were on HHD
- In 1980, ~45% (Australia) and >50% (New Zealand) were on HHD
- Through to 2000, HHD all but disappeared

# REASONS FOR THE DECLINE IN HHD

- 1) Increasing **older or seriously ill, diabetes or severe CVD pts**
- 2) Rapid increase of **OPD dialysis units for-profit**
- 3) Concern that patients should not dialyze **without direct supervision** by staff
- 4) Lack of knowledge of the **advantages of the HHD** modalities
- 5) Lack of patient and family **motivation**, patient fears of technical aspects of hemodialysis, risk of social isolation, and **fear of dealing with their blood access and equipment**
- 6) Lack of interest and experience with **HHD among practicing nephrologists**
- 7) The small number of experienced **dialysis programs available to train patients in HHD**

**Table 1.** Prevalence of HHD among all dialysis patients in selected countries, 2008–2010

Country	HHD, %	Registry	Country	HHD, %	Registry
USA	1.0	USRDS 2010 <sup>1</sup>	Italy	2.7	ERA-EDTA 2009
Argentina	0.0	USRDS 2010	Japan	0.1	JSDT Registry 2010 <sup>2</sup>
Australia	9.3	ANZDATA 2010 <sup>3</sup>	Malaysia	1.0	USRDS 2010
Austria	0	ERA-EDTA 2009 <sup>4</sup>	Mexico	0	USRDS 2010
Bangladesh	0.3	USRDS 2010	New Zealand	16.3	ANZDATA 2010
Belgium	0.7	ERA-EDTA 2009	Philippines	0	USRDS 2010
Canada	3.5	CORR 2011 <sup>5</sup>	Poland	0	ERA-EDTA 2009
Denmark	2.7	ERA-EDTA 2009	Spain	0.1	ERA-EDTA 2009
Finland	1.6	ERA-EDTA 2009	Serbia	1.3	USRDS 2010
Norway	0.1	ERA-EDTA 2009	Taiwan	0	USRDS 2010
Sweden	1.2	ERA-EDTA 2009	Thailand	0	USRDS 2010
Netherlands	1.0	ERA-EDTA 2009	UK	1.2	ERA-EDTA 2009
Hong Kong	0.41	USRDS 2010	Uruguay	0	USRDS 2010

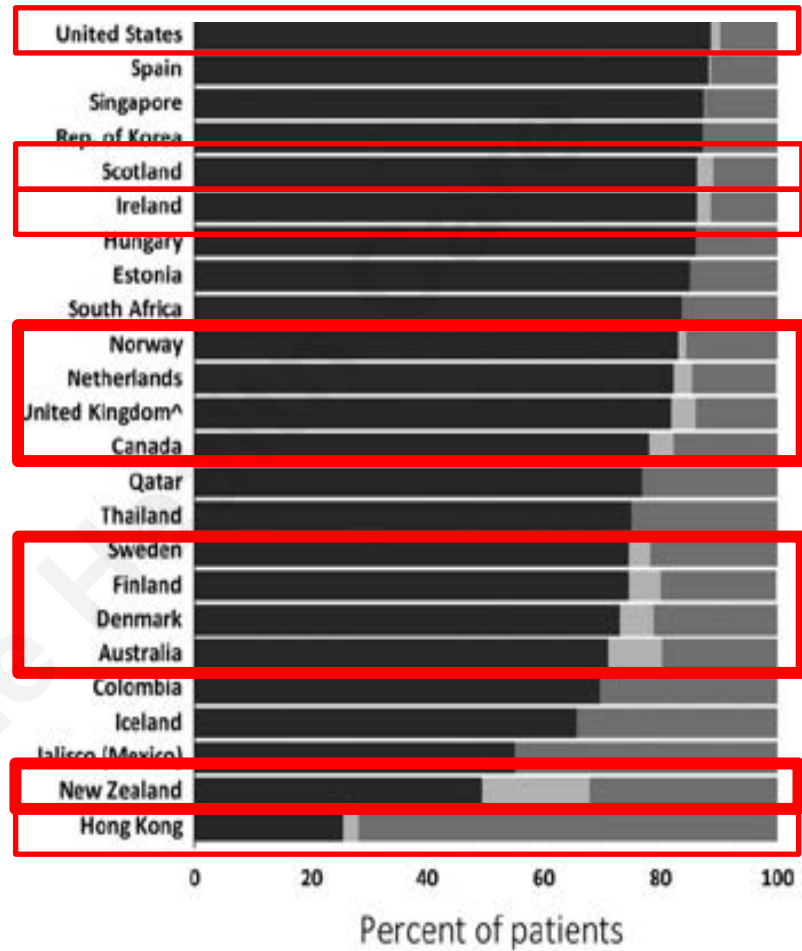
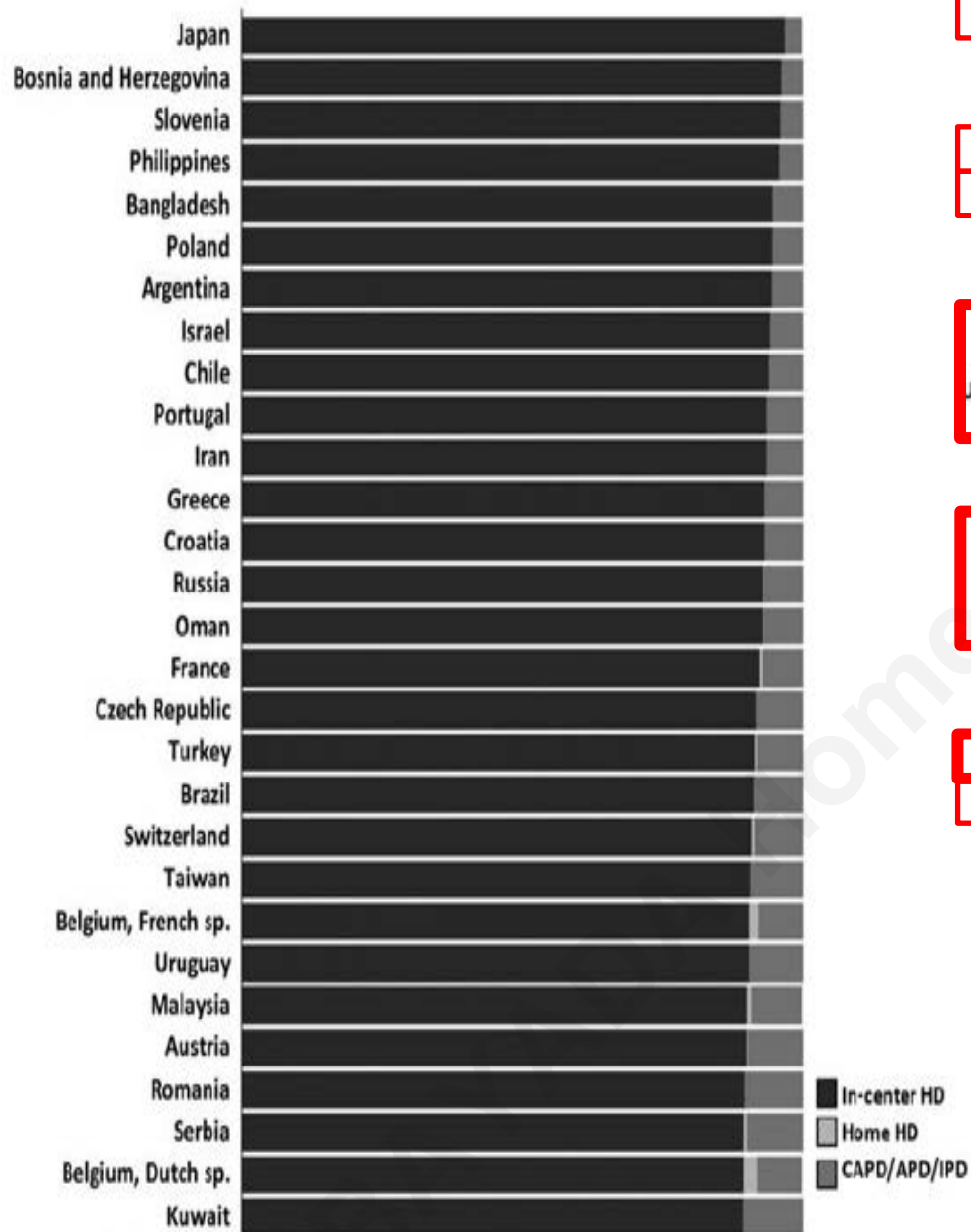
<sup>1</sup> 2008 data as reported from the United States Renal Data System (USRDS) 2010.

<sup>2</sup> Japanese Society for Dialysis Therapy, present status of chronic dialysis in Japan on December 31, 2010.

<sup>3</sup> Australia and New Zealand Dialysis and Transplant 2010 Registry.

<sup>4</sup> European Renal Association-European Dialysis and Transplantation Association Annual Report 2009 Registry.

<sup>5</sup> Canadian Renal Replacement (CORR) 2011 Registry.



(+correlation): prevalence of PD population/  
 percent of patients who were employed full  
 or time/ younger patient population, the  
 number of years the facility had been  
 certified by Medicare

International variations in percentage of prevalent dialysis patients, by type, in 2013 from the USRDS

# Challenges and Opportunities in Expanding Home Hemodialysis for 2025

Martin J. Schreiber, Dinesh K. Chatoth, and Page Salenger

The Advancing American Kidney Health Initiative has set an aggressive target for home dialysis growth in the United States, and expanding both peritoneal dialysis and home hemodialysis (HHD) will be required. While there has been a growth in HHD across the United States in the last decade, its value in controlling specific risk factors has been underappreciated and as such its appropriate utilization has lagged. Repositioning how nephrologists incorporate HHD as a critical renal replacement therapy will require overcoming a number of barriers. Advancing education of both nephrology trainees and nephrologists in practice, along with increasing patient and family education on the benefits and requirements for HHD, is essential. Implementation of a transitional care unit design coupled with an intensive patient curriculum will increase patient awareness and comfort for HHD; patients on peritoneal dialysis reaching a modality transition point will benefit from Experience the Difference programs acclimating them to HHD. In addition, the potential link between HHD program size and patient outcomes will necessitate an increase in the size of the average HHD program to more consistently deliver quality dialysis results. Addressing the implications of the nursing shortage and need for designing in scope staffing models are necessary to safeguard HHD growth. Seemingly, certain government payment policy changes and physician documentation requirements deserve further examination. Future HHD innovations must result in decreasing the burden of care for HHD patients, optimize the level of device and biometric data flow, facilitate a more functional centralized patient management care approach, and leverage computerized clinical decision support for modality assignment.

2021 Annual Report

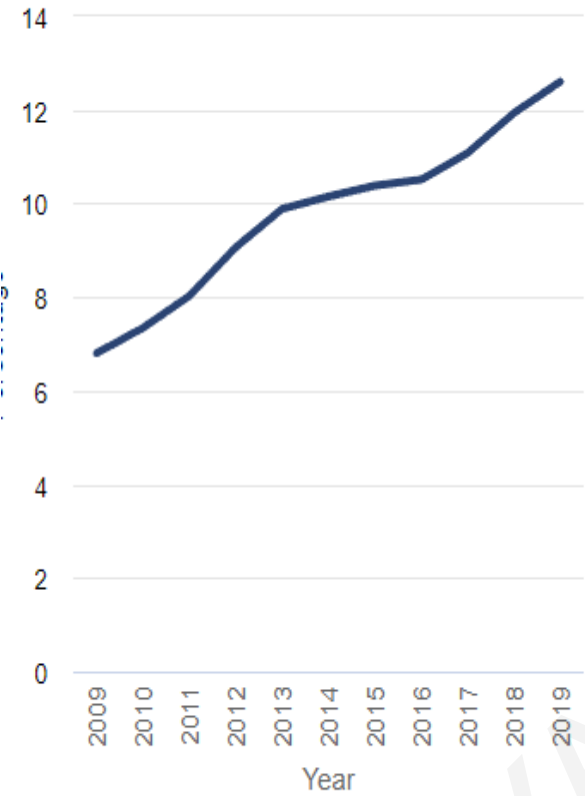
- Introduction
- Navigating the 2021 ADR
- Chronic Kidney Disease
- End Stage Renal Disease >
- 1. Incidence, Prevalence, Patient Characteristics, and Treatment Modalities
- 2. Home Dialysis**
- Highlights
- Introduction
- Methods
- Figure 2.1a Home dialysis utilization, 2009-2019
- Figure 2.1b Home dialysis utilization, by payer, 2009-2019
- Figure 2.2 Access to home dialysis, 2019
- Figure 2.3 Home dialysis patients per facility, 2019
- Figure 2.4 Home dialysis patient characteristics, 2019**
- Figure 2.5 Duration of ESRD at home dialysis initiation, 2019
- Figure 2.6 Training sessions, 2019
- Figure 2.7 APD utilization, 2009-2019
- Figure 2.8a HHD treatments per week, 2019
- Figure 2.8b HHD session duration, 2019
- Figure 2.8c HHD hours per week, 2019
- Figure 2.8d Medicare-covered HHD treatments per week, 2019
- Figure 2.9 Complications on PD, 2009-2019
- Figure 2.10 Complications on HHD, 2009-2019
- Figure 2.11 Conversion from home dialysis to in-facility hemodialysis, 2009-2018
- Figure 2.12 Hospitalization before technique failure, 2009-2019
- Figure 2.13 Mortality after home dialysis initiation, 2009-2018
- Figure 2.14 Kidney transplantation after home dialysis initiation, 2009-2018
- Figure 2.15 Wait-listing prevalence, 2009-2019

- ✓ From 2009 to 2019, the percentage of incident dialysis patients performing home dialysis increased from 6.8% to **12.6%**
- ✓ From 2009 to 2019, the percentage of patients performing home dialysis at 1 year after dialysis initiation increased from 10.5% to **18.2%**
- ✓ From 2009 to 2019, the percentage of prevalent patients performing home dialysis increased from 8.9% to 13.1%. Those 13.1% of patients in 2019 included **1.9% who performed home hemodialysis and 11.2% who performed peritoneal dialysis.**
- ✓ In 2019, 45% of Medicare-certified dialysis facilities were not certified to offer either home dialysis modality; 8% were certified to offer at least 1 home dialysis modality but had no active patients; and **47% were certified to offer at least 1 home dialysis modality and had active patients**



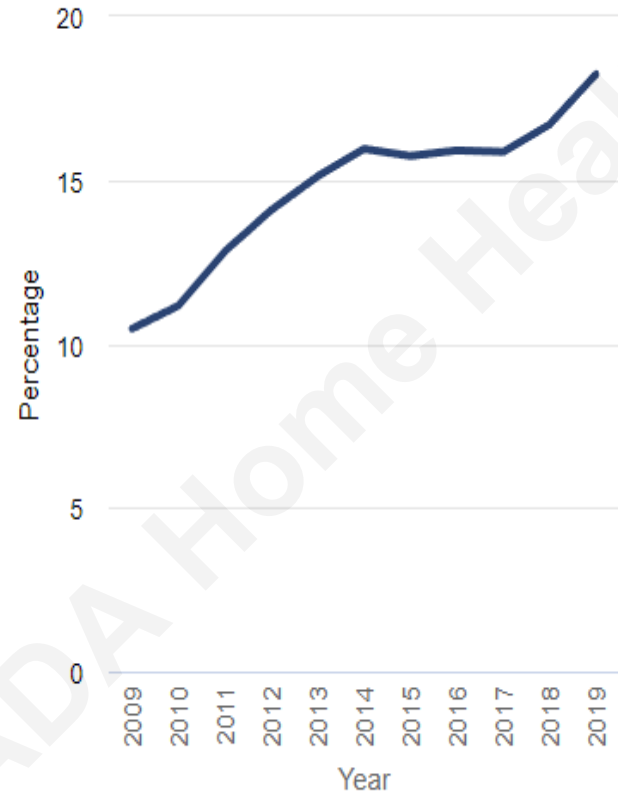
Home Dialysis
  Home Hemodialysis
  Peritoneal Dialysis

Among Incident Patients



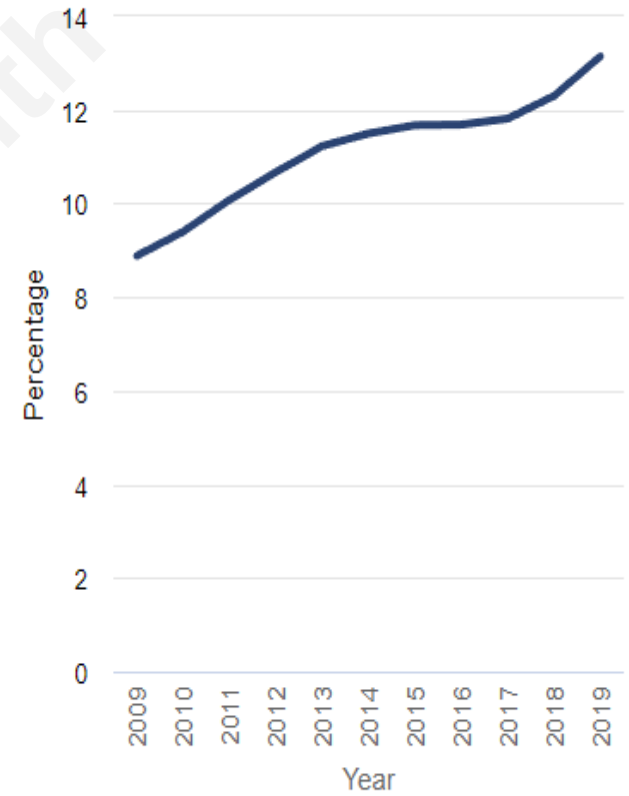
- Overall

At 1 Year After Dialysis Initiation



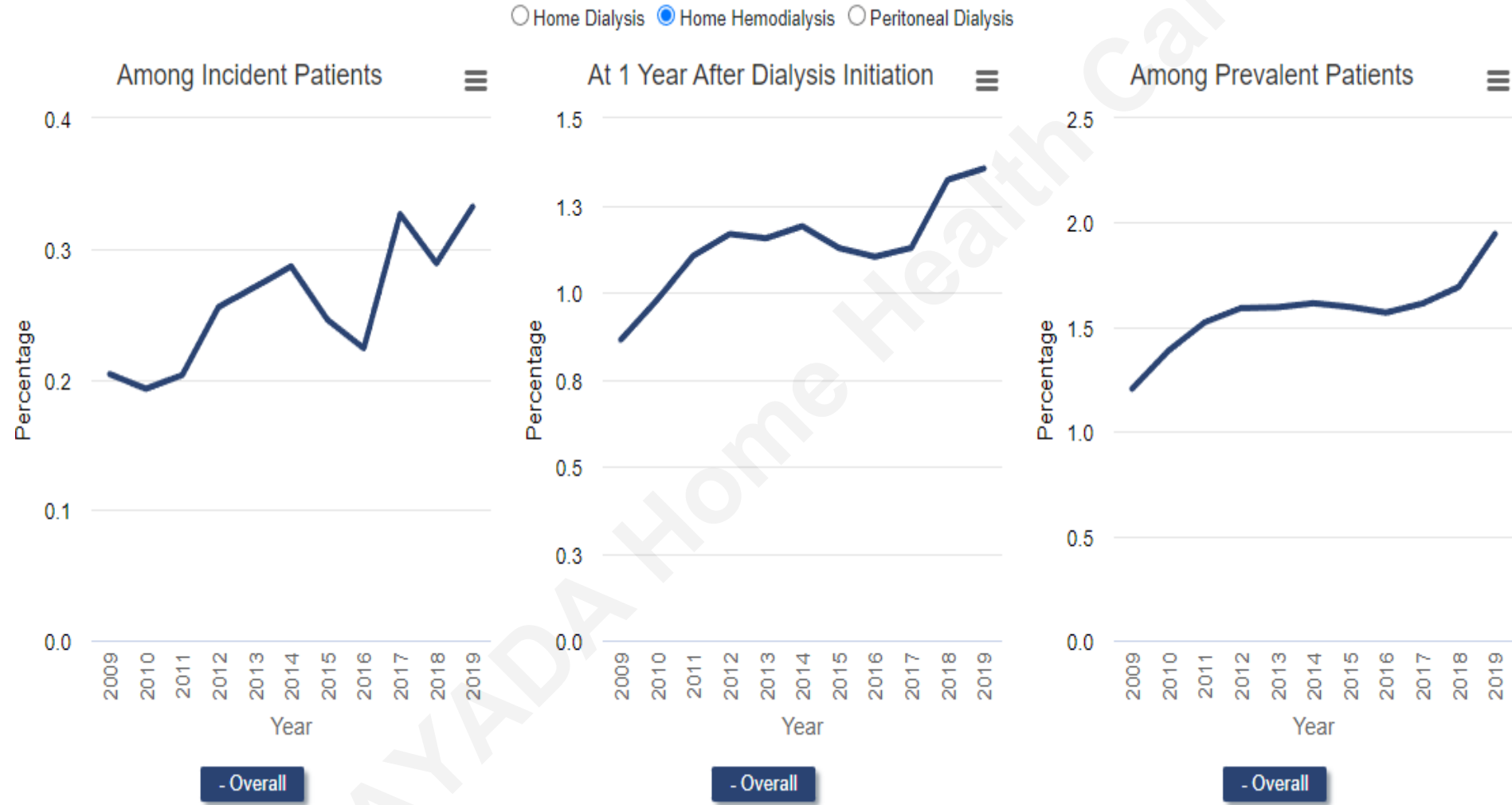
- Overall

Among Prevalent Patients



- Overall

BAYADA Home Health Care



For home hemodialysis in 2019, 39.1% of patients were prescribed at least 3.5 treatment sessions per week (i.e., every-other-day dialysis) and fewer than 5.0 sessions per week. Another 38.0% of patients were prescribed at least 5.0 and fewer than 6.0 sessions per week (Figure 2.8a).

Medicare covered 3.8 home hemodialysis treatment sessions per week in 2019 (Figure 2.8d).  
 → *“Regardless of the prescribed frequency of home hemodialysis, Medicare reimburses providers for additional sessions only if medical justification is provided.”*

Among patients who initiated home hemodialysis in 2017-2018, the 2-year cumulative incidence of conversion from home dialysis to in-facility hemodialysis was 25%. The corresponding incidence with peritoneal dialysis was 24% (Figure 2.11).

Among patients who initiated home hemodialysis in 2017-2018, the 2-year cumulative incidence of kidney transplantation was 10%. The corresponding incidence with peritoneal dialysis was 11% (Figure 2.14).

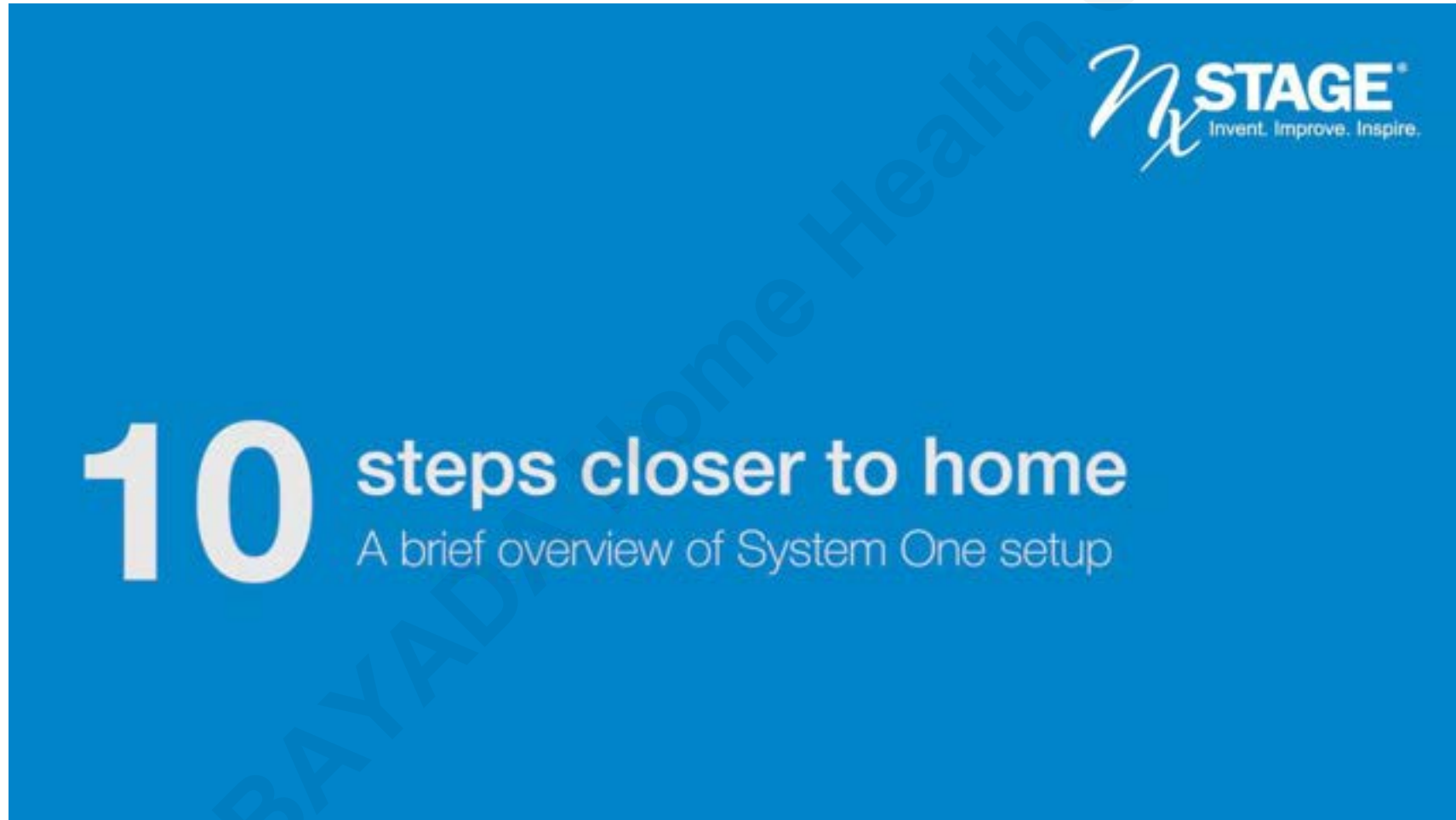
In 2019, the prevalence of kidney transplant waitlisting was 28% with home hemodialysis and 30% with peritoneal dialysis (Figure 2.15).

# Survival in Daily Home Hemodialysis and Matched Thrice-Weekly In-Center Hemodialysis Patients





- A matched-cohort design to assess relative mortality
  - SDHHD and thrice-weekly in-center hemodialysis patients between 2005 and 2008.
- The US Renal Data System database
  - 1873 vs. 9365 (1:5)



# NxStage System One Setup Overview



# Home Hemodialysis Machines

<ul style="list-style-type: none"> <li>■ AK 95S or</li> <li>■ AK 200ULTRA S</li> </ul>	<p><b>CHD/NHHD/SDHD</b> 모두 가능 P.R/O 필요 , 한국 시장 사용 경험(+)</p>	
<ul style="list-style-type: none"> <li>■ NxStage Therapy System (NxStage)</li> </ul>	<p><b>SDHD</b> 작고 이동이 가능 Water Tx 불필요 ( P.R/O 불필요 ) 카트리지가입으로 장착 쉽고 사용 편리. 미국/영국 사용량 증가</p>	
<ul style="list-style-type: none"> <li>■ 2008K @Home (Fresenius)</li> </ul>	<p><b>CHD/NHHD/SDHD</b> 모두 가능 P.R/O 필요</p>	
<ul style="list-style-type: none"> <li>■ Allient system (Renal Solution, Inc)</li> </ul>	<p><b>CHD/SDHD</b> P.R/O 불필요. 환자에게 제거된 성분을 다시 특수한 카트리지를 통해 유해 물질 제거 후 재사용</p>	
<ul style="list-style-type: none"> <li>■ Quanta, Physidia, Inc</li> </ul>	<p>All are single-pass, normal DFR machines (unlike NxStage which utilizes low dialysate flow rates) Home Hemodialysis: What Is Old Is New Again, 2017 Sem dial</p>	

# Australian and New Zealand Outcomes

## Effect of modality on mortality

AJKD

*Home Hemodialysis and Mortality Risk*

**Table 2.** Dialysis Treatment and Laboratory Characteristics in a Restricted Cohort of HD Patients Without PD Exposure

	Conventional Facility HD	Conventional Home HD	Frequent/Extended Facility HD	Frequent/Extended Home HD
No.	11,695	1,454	207	597
HD session length <sup>a</sup>				
<3.5 h	463 (4)	38 (3)	76 (37)	42 (7)
3.5-3.9 h	460 (4)	25 (2)	3 (1)	10 (2)
4.0-4.4 h	6,263 (54)	320 (22)	58 (28)	71 (12)
4.5-4.9 h	1,784 (15)	180 (12)	23 (11)	43 (7)
≥5.0 h	2,717 (23)	891 (61)	47 (23)	431 (72)
Kt/V <sup>a</sup>	1.33 (1.19, 1.44)	1.33 (1.21, 1.44)	1.21 (1.07, 1.37)	1.37 (1.21, 1.53)
HD session frequency <sup>a</sup>				
<3×/wk	307 (3)	17 (1.2)	0 (0)	0 (0)
3×/wk	11,380 (97)	1437 (98.8)	7 (3)	149 (25)
3-4.9×/wk	0 (0)	0 (0)	110 (53)	346 (58)
≥5×/wk	0 (0)	0 (0)	90 (44)	102 (17)
HD angioaccess <sup>a</sup>				
Arteriovenous fistula	6,847 (59)	994 (68)	165 (80)	512 (86)
Arteriovenous graft	1,058 (9)	155 (11)	14 (7)	54 (9)
Central venous catheter	2,076 (18)	29 (2)	23 (11)	10 (2)
Hemodialyzer flux <sup>a</sup>				
High	8,407 (72)	1,100 (76)	90 (44)	337 (56)
Low	3,059 (26)	348 (24)	113 (55)	257 (43)
Hemoglobin <sup>a</sup> (g/dL)	11.5 (10.3, 12.6)	11.6 (10.4, 12.7)	12.0 (11.0, 12.8)	11.8 (10.7, 13.0)
Erythropoietin use <sup>a</sup>	7,976 (68.2)	817 (56.10)	180 (86.96)	482 (80.70)
Serum ferritin <sup>a</sup> (ng/mL)	355 (187, 592)	240 (117, 441)	407 (173, 704)	284 (136, 486)
Serum phosphorus <sup>a</sup> (mg/dL)	5.17 (4.06, 6.47)	5.26 (4.21, 6.32)	5.23 (4.03, 6.23)	4.89 (3.84, 6.16)
Serum calcium <sup>a</sup> (mg/dL)	9.26 (8.70, 9.82)	9.66 (9.14, 10.14)	9.46 (8.94, 9.90)	9.82 (9.30, 10.3)

# Mortality, Hospitalization, and Technique Failure in Daily Home Hemodialysis and Matched Peritoneal Dialysis Patients: A Matched Cohort Study



Eric D. Weinhandl, PhD.<sup>1</sup> David T. Gilbertson, PhD.<sup>1</sup> and Allan J. Collins, MD<sup>1,2</sup>

**Table 2.** Absolute Rates and RRs of Death for Daily HHD Patients in Intention-to-Treat and On-Treatment Analyses

	All Patients				ESRD Duration < 6 mo on Index Date			
	Daily HHD	PD	RR <sup>a</sup> (95% CI)	P	Daily HHD	PD	RR <sup>a</sup> (95% CI)	P
<b>Intention-to-treat</b>								
All-cause mortality	12.1	15.1	0.80 (0.73-0.87)	<0.001	11.5	11.8	0.95 (0.80-1.13)	0.6
Cause-specific mortality								
Cardiovascular disease	5.0	6.2	0.81 (0.70-0.93)	0.002	4.4	4.9	0.87 (0.66-1.14)	0.3
Infection	1.5	2.1	0.71 (0.55-0.91)	0.006	1.5	1.4	1.04 (0.64-1.70)	0.9
Cachexia/dialysis withdrawal	1.4	2.1	0.62 (0.48-0.80)	<0.001	1.3	1.7	0.75 (0.46-1.21)	0.2
Other specified cause	1.9	1.9	1.04 (0.82-1.32)	0.8	2.0	1.6	1.27 (0.81-1.98)	0.3
Unknown cause	2.3	2.8	0.81 (0.66-1.00)	0.05	2.3	2.3	0.94 (0.64-1.39)	0.8
Interval-specific mortality								
Year 1	12.3	15.7	0.78 (0.69-0.88)	<0.001	11.8	11.0	1.05 (0.83-1.32)	0.7
Year 2	12.0	14.5	0.81 (0.69-0.96)	0.01	11.2	12.2	0.89 (0.66-1.21)	0.5
Years 3-4	11.6	13.9	0.84 (0.68-1.04)	0.1	10.8	13.8	0.80 (0.53-1.20)	0.3
<b>On-treatment</b>								
All-cause mortality	12.2	15.0	0.81 (0.73-0.90)	<0.001	12.1	11.4	1.03 (0.85-1.26)	0.8
Cause-specific mortality								
Cardiovascular disease	5.3	6.4	0.83 (0.70-0.97)	0.02	5.0	5.2	0.93 (0.69-1.26)	0.6
Infection	1.6	2.1	0.71 (0.53-0.95)	0.02	1.7	1.2	1.40 (0.78-2.50)	0.3
Cachexia/dialysis withdrawal	1.3	1.9	0.68 (0.50-0.93)	0.02	1.5	1.5	0.95 (0.54-1.66)	0.8
Other specified cause	1.9	1.9	0.99 (0.75-1.32)	0.9	1.9	1.4	1.28 (0.74-2.22)	0.4
Unknown cause	2.2	2.7	0.78 (0.61-1.01)	0.06	2.0	2.1	0.92 (0.57-1.49)	0.7
Interval-specific mortality								
Year 1	12.2	15.2	0.80 (0.70-0.91)	<0.001	11.9	10.6	1.10 (0.85-1.42)	0.5
Year 2	12.5	14.1	0.87 (0.70-1.07)	0.2	11.7	10.3	1.10 (0.74-1.64)	0.6
Years 3-4	11.4	16.0	0.73 (0.53-1.01)	0.05	14.2	19.8	0.68 (0.40-1.16)	0.2



## A comparison of technique survival in Canadian peritoneal dialysis and home hemodialysis patients

Emilie Trinh<sup>1</sup>, James A. Hanley<sup>2</sup>, Annie-Claire Nadeau-Fredette<sup>3</sup>, Jeffrey Perl<sup>4</sup> and Christopher T. Chan<sup>5</sup>

<sup>1</sup>Division of Nephrology, Department of Medicine, McGill University Health Center, McGill University, Montreal, Quebec, Canada, <sup>2</sup>Department of Epidemiology, Biostatistics, and Occupational Health, McGill University, Montreal, Quebec, Canada, <sup>3</sup>Division of Nephrology, Department of Medicine, Hôpital Maisonneuve-Rosemont, Université de Montreal, Montreal, Quebec, Canada, <sup>4</sup>Division of Nephrology, Department of Medicine, St Michael's Hospital and the Keenan Research Center in the Li Ka Shing Knowledge Institute, St Michael's Hospital, Toronto, Ontario, Canada

**Table 1. Patient characteristics at home dialysis initiation, 2000–12**

Characteristics	PD	HHD
<i>n</i>	14 461	853
Age, years, %		
<50	23	36
50–65	31	41
≥65	46	23
Male gender, %	59	67
Race, %		
Caucasian	68	72
Asian	9	6
Black	4	7
Other	20	14
Cause of ESKD, %		
Diabetes	36	28
Glomerulonephritis	19	23
Renal vascular disease	18	11
Polycystic kidney disease	5	13
Other	19	23
Unknown	3	2
BMI category, kg/m <sup>2</sup> , %		
<18.5	3	3
18.5–24.9	35	28
25–29.9	32	26
>30	23	34
Unknown	7	9
Access type at initiation of dialysis, %		
Arteriovenous fistula/graft	N/A	39
Central venous catheter	N/A	32
Unknown	N/A	29
Time of starting therapy, %		
Incident, months	72	22
<3	14	28
3–6	8	23
6–12	6	27
Prior IHD	27	74
PD type, %		
CAPD	71	N/A
APD	29	N/A
HHD type, %		
Conventional	N/A	52
Short daily	N/A	14
Slow nocturnal	N/A	34

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1년까지는 HHD의 TF가 많은 경향이나 그 이후로는 유의하게 HHD에서 TF가 더 적다

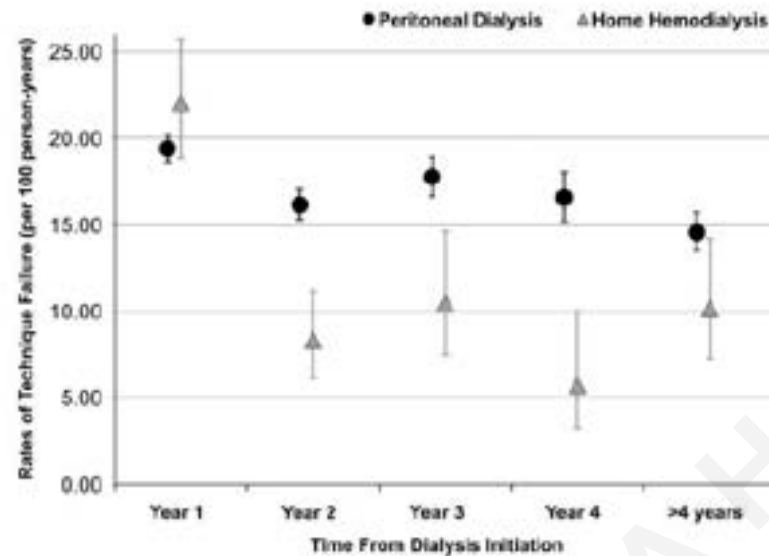


FIGURE 1: Crude rates of technique failure by time from dialysis initiation in HHD and PD.

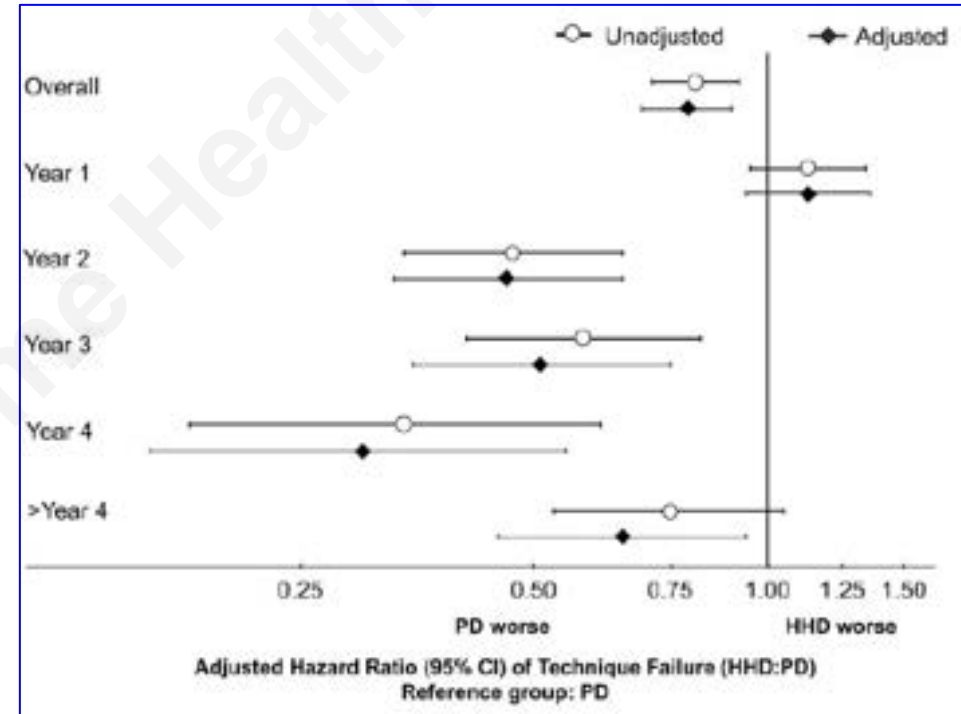


Table 4. Technique failure event rates by different cut-off definitions

Days	PD			HHD		
	Events	Events/100 person-year	Proportion returning to PD within 1 year (%)	Events	Events/100 person-year	Proportion returning to HHD within 1 year (%)
30	6066	18.3	9.4	306	14.9	16.0
60	5874	17.4	6.5	281	13.3	8.5
90	5729	16.7	4.1	273	12.8	5.8
180	5569	16.0	1.3	265	12.3	3.0
365	5494	15.6	N/A	257	11.7	N/A

## A comparison of technique survival in Canadian peritoneal dialysis and home hemodialysis patients

Emilie Trinh<sup>1</sup>, James A. Hanley<sup>2</sup>, Annie-Claire Nadeau-Fredette<sup>3</sup>, Jeffrey Perl<sup>4</sup> and Christopher T. Chan<sup>5</sup>

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**Table 3. Causes of technique failure in PD and HHD patients**

Cause	PD (%)	HHD (%)
Peritonitis	13	N/A
Other abdominal complications	7	N/A
Inadequate dialysis	18	6
Social	23	33
Insufficient resources	2	17
Other	28	21
Unknown	9	23

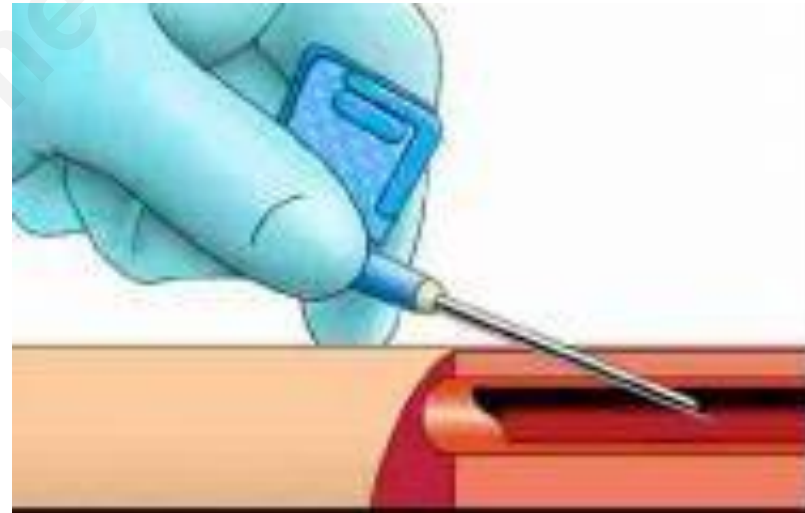
N/A, not applicable.

HHD의 TF는 Social + Insufficient resource 가 50%를 차지했다  
Social resources : quality of pre-dialysis education, training approach, training duration, frequency of follow-up care, nurse-to-patient ratios and availability of psychosocial support in case of patient or caregiver burnout

# Buttonhole Technique

- AKA “Constant-site cannulation”
- Described in 1977 (Hospital for Miners, Poland)

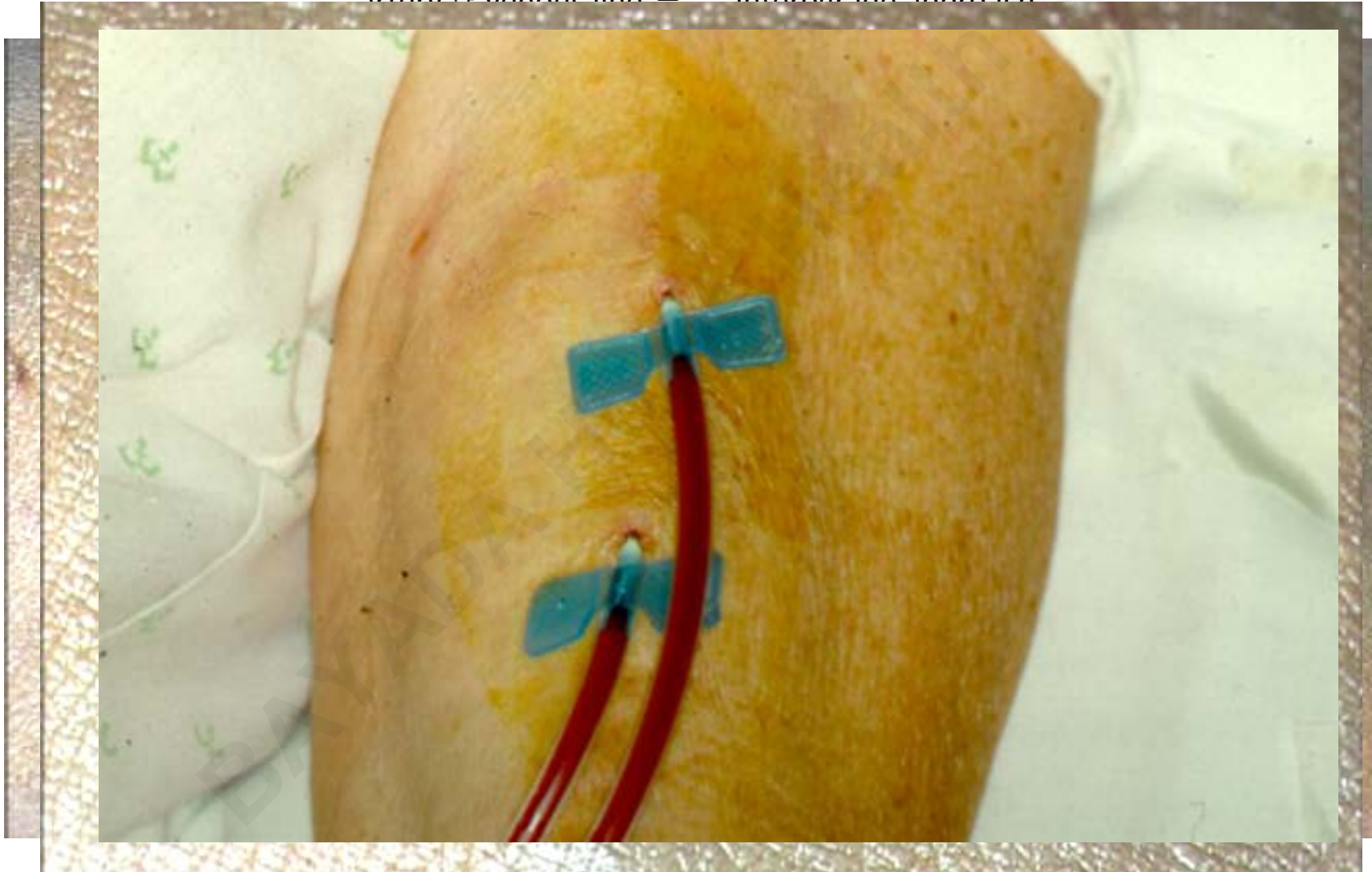
- Cannulation:
  - Same spot
  - Same angle
  - Same depth
  - EVERY TIME



Scar tissue tunnel tract develops

# Buttonholes needles during dialysis

artery ⊙ venous line □ ⊞ anterograde approach



# Adverse Events

studies	population	Variables	Risk
FHN1 trial group (2010, 2013)	RCT, 245 pts	First vascular event(repair, loss or access-related hospitalization)	HR 1.90(1.11-3.25), P=0.017
FHN2 trial group (2011, 2013)	RCT, 87 pts	First vascular event(repair, loss or access-related hospitalization)	HR 1.81(0.94-3.48), P=0.076
Jun et al.(2013)	Retrospective observational study, 286 pts	Survival free of vascular access-related events(infections and interventions) Vascular access-related events	KM curve: shorter survival for intensive group, P<0.001 HR 2.85 per dialysis session(1.14-7.15), P=0.04

# Button hole infection

Studies	Population	Variavles	Risk
Van Eps et al.(2010)	Retrospective observational study, 235 patients	Septic dialysis-related events : BH in NHD compared with CHD	IRR 3.0(1.04-8.66), p = 0.04
Nesrallah et al.(2010)	Retrospective observational pre-post study	Rates of S. aureus bacteremia: Pre/post topical mupirocin , Post-mupirocin compared with CHD patients	OR 6.4(1.3-32.3), P=0.02

## Recent Trends in Home Hemodialysis Therapy in Japan

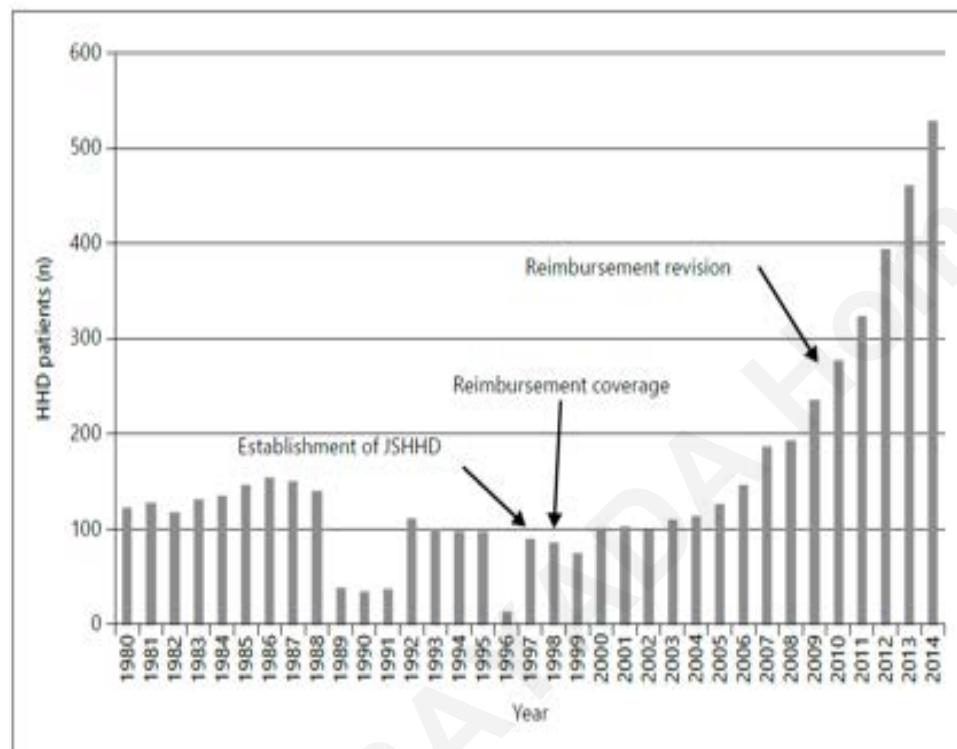
Ikuto Masakane<sup>a</sup> · Norio Hanafusa<sup>b</sup> · Tomoyuki Kita<sup>c</sup> · Kenji Maeda<sup>d</sup><sup>a</sup>Yabuki Hospital, Yamagata, <sup>b</sup>Kidney Center, Tokyo Women's Medical University, Tokyo, <sup>c</sup>Sakai Rumi Clinic, Kobe, and<sup>d</sup>Daiko Sunadabashi Clinic, Nagoya, Japan

Fig. 1. Number of HHD patients in Japan, based on data from the JSDT.

Table 1. Reimbursements for HHD

1. Technical fees for facility use	
- Patient education and care in outpatient department	80,000 JPY/month
- Intensive care (first 2 months only)	20,000 JPY × 2/month
- Machine fee	100,000 JPY/month
2. Reimbursable materials	
- Dialyzer, dialysis fluid, anticoagulant, saline	Official price
3. Nonreimbursable materials	
- Needle, antiseptic, disinfectant, endotoxin retentive filter	
4. Nonreimbursable effort and labor	
- Patient education in conditioning stage	
- Home visits for assessment, machine maintenance, water quality test	
- Patient's costs (initial cost, maintenance costs for water, electricity)	

**Recommendation 4:**  
**Emphasize Home Therapies**

---

*Nephrology fellowship training programs must provide more extensive training in home therapies, including home hemodialysis and peritoneal dialysis.*

**Why?**

- Recognizes home-based modalities for renal replacement therapy are often preferred options for people with kidney failure.
- Supports one of the goals of the Advancing American Kidney Health executive order from July 2019.
- Expands nephrologists' expertise in counseling and managing patients on these therapies, which currently lags behind nephrologists' comfort with in-center hemodialysis.

**What?**

- All fellows in all nephrology fellowship training programs must be trained to Level I competence in home therapies, which likely means strengthening the current ACGME Common Program Requirements in this arena. Areas of training must include:
  - Longitudinal care of people with kidney failure treated in the home.
  - Technical aspects of home therapies.
  - Regulatory aspects of home therapies.
  - Emerging technologies and treatments.
- Interested nephrology fellowship training programs may provide training to Level II and III competence. Level III training in home therapies will likely require a third year of fellowship training.
- Consideration should be given to the formal recognition of centers of excellence for home therapies at which a third year of training can be performed. A potential model for such centers of excellence is the American Society of Hematology Hematology-Focused Fellowship Training Program.



처리기관	보건복지부 보건의료정책실 보건의료정책관 의료기관정책과		
담당자(연락처)	[REDACTED]	신청번호	[REDACTED]
접수일	2018-05-30 16:34:11	처리기관 접수번호	[REDACTED]

1. 의료법 제33조제1항제2호에 따르면, 환자나 환자보호자의 요청에 따라 진료하는 경우에는 의료기관 외에서 의료업이 가능한 것으로 알고 있습니다.

그렇다면, 요양급여를 받을 수 있는 건강보험 가입자가 만성신장병으로 진료를 받아야 할 필요성이 있는 경우, 환자가 요청하면 의사 및 간호사가 환자 자택을 방문하여 혈액투석을 실시하는 것이 가능한지요? 보행이 곤란하거나 불가능한 경우에만 예외적으로 가능한 것인지, 그렇다면 어떠한 서류로서 보행 곤란 등을 입증해야 하는지요? 또한, 환자의 요청이 있었음을 입증하는 서류도 별도로 구비해야 하는지요?

2. 요양급여의 적용기준 및 방법에 관한 세부사항과 심사지침에 따르면, 왕진 시 진찰료, 진료료, 기타 비용(교통비 등)외에는 별도 산정하거나 본인부담시킬수 없다고 되어 있습니다. 혈액투석 시에는 행위 수가(자702) 외에 재료대(자702주1) 및 약제비(투석액)가 발생합니다. 보건

복지부 고시 제2009-122호에 따르면 재료대(자702주1) 및 약제비(투석액)는 별도 산정하여 환자에게 부담시킬 수 없는지요?

환자가 해당 치료에 대해 요양급여를 받지 않고 비용 일체를 본인부담하겠다고 할 경우, 보건복지부 고시 제2009-122호를 적용 대상이 아닌지요? 환자가 일체의 비용을 부담해도 법령 위반이 아닌지요?

3. 왕진 시 의사는 처방전을 발행할 수 있는지요? 혈액투석 시에는 혈액투석액이 반드시 필요합니다. 이 때에 자택에서 투석을 실시하므로, 원외처방전을 발행해야 하는 것인지요?

답변일

2018-06-08 09:47:48

처리결과(답변내용)

1. 의료기관에서 수고가 많으십니다.

2. 왕진을 통해 혈액투석이 가능한지 문의하셨으며 이에 대해 회신드립니다.

○ 「의료법」 제33조제1항에서는 “의료인은 이 법에 따른 의료기관을 개설하지 아니하고는 의료업을 할 수 없으며, 다음 각 호의 어느 하나에 해당하는 경우 외에는 그 의료기관내에서 의료업을 하여야 한다.”라고 규정하고 있으며 응급환자 진료 및 특별한 사례에 대한 왕진 등에 한하여 예외적으로 의료기관 밖에서의 의료행위를 제한적으로 허용하고 있습니다.

○ 이와 관련 의료법 제33조제1항제2호에 따른 환자나 환자 보호자의 요청에 따라 진료하는 경우란 특정 환자에 대한 개별적이고 구체적인 요청에 응하여 이루어지는 진료로 통상 왕진을 의미하며, 환자가 환자 보호자의 요청에 따라 의료기관 외에서 진료할 수 있다는 동 조항을 근거로 정기적, 계속적으로 불특정 다수의 환자를 진료하는 경우에는 의료법 위반사항이 될 수 있습니다.

- 아울러 문의하신 왕진 신청시 증빙서류 등에 대해서는 의료법에서 별도로 규정하고 있지 않음을 알려드립니다.

○ 이렇게 의료인이 개설한 의료기관 내에서 의료업을 영위하도록 한 것은 의료행위가 의료기관 외에서 행하여질 경우 의료의 질 저하와 적정 진료를 받을 환자의 권리 침해 등으로 인해 의료질서가 문란하게 되고, 국민의 보건위생에 심각한 위험을 초래하게 되는 것을 사전에 방지하고자 하는 보건의료정책상 필요에 따른 것입니다.(대법원 2011.4.14. 선고 2010두26315 판결 참조)

# 복막투석 재택관리 시범사업 개념도



출처: 건강보험심사평가원



## 비스 제공절차



출처: 건강보험심사평가원

# 일 병행하는 복막투석...올해 말 지원 끝나는데 후속 대책은

<https://mbn.co.kr/news/society/4876727>

기사입력 2022-11-08 19:02 | 최종수정 2022-11-08 19:40



### 회원공간

대한신장학회의  
회원공간입니다.



## 재택투석 연구회

본 연구회는 재택투석에 대한 국내외 연구 및 실제 사례에 대한 탐구와 국내 재택투석 도입에 대한 가능성 제고 및 최적의 방안을 마련하는 것을 목표로 하며, 국내외 연구자 간 활발한 교류를 통한 학문의 발전과 회원 상호간의 친목과 협동을 도모함을 목적으로 한다.

### 신이식연구회

본회는 신장학 중 이식 분야의 진료, 교육, 의 향상을 위하여 국내,외 지식 교류를 통한 발전과 회원 상호간의 친목과 협동을 도모으로 한다.

- 연구회장 채동완 (서울의대)
- 총무 양철우 (가톨릭의대)

• 연구회장 김동기 (서울의대)

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- 총무 이한규 (이한규내과)

창간시점

N 40년

과실 대관



상호간의 친목과 회원의 권익 보호 및 투석의 발전과 투석환자의 건강증진에 이바지하도록 한다.

# 감사합니다.



콩팥 건강 지킴이  
구독자 1.1천명

채널 맞춤설정  
동영상 관리

홈 동영상 재생목록 커뮤니티 채널 정보



만성콩팥병, 간식 드시는건 좋은데 이것만큼은 정말 피하세요!

조회수 11,485회 · 2개월 전

신장내과 전문의가 알려주는 쉬운 콩팥이야기  
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현, 병원연세내과 원장...  
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