

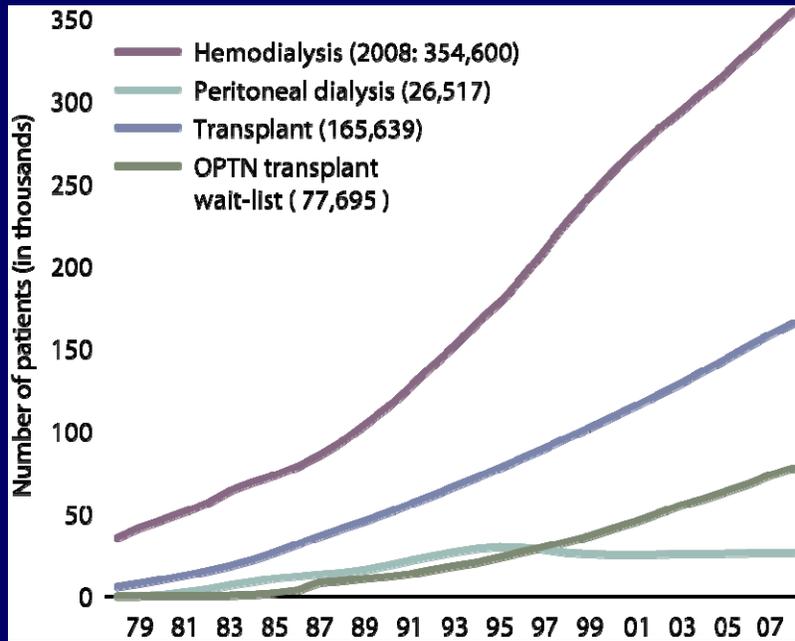
Organization and Structure of a Peritoneal Dialysis
Program:
an important ingredient for success

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Overview of Presentation

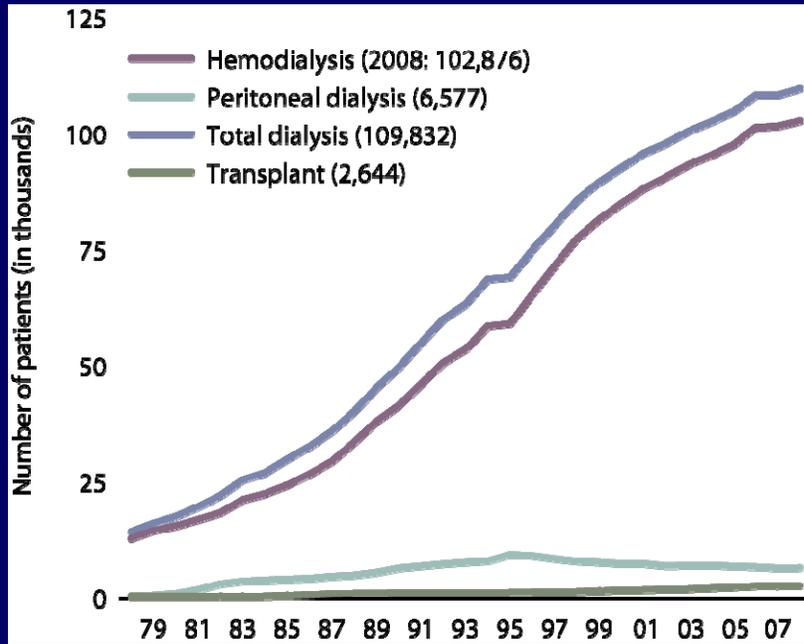
- Review of current status of PD in North America
- Review of recent changes in our understanding of the role of PD in managing patients with ESRD
- Review of the structural requirements for a successful PD program

USRDS 2010: PREVALENT ESRD PATIENTS



% of prevalent patients on PD remains low; data from USRDS

USRDS 2010: INCIDENT ESRD PATIENTS



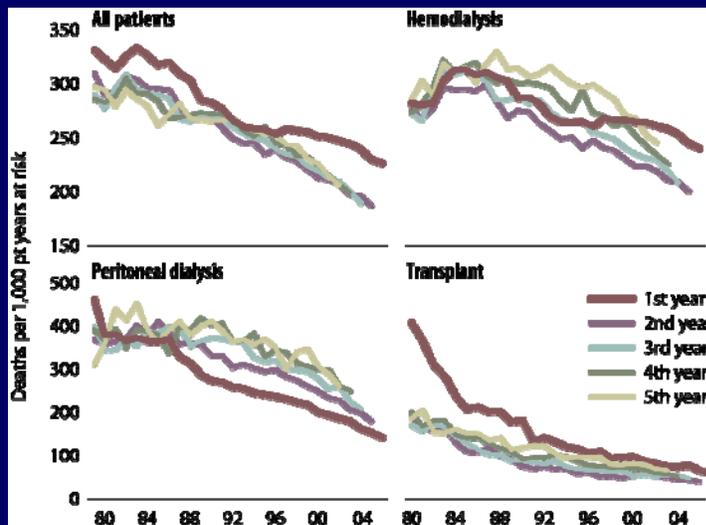
% of incident patients starting PD remains low. Data from USRDS

Changes in Our Understanding of the Role of PD as Treatment for ESRD

- A renewed interest in PD as bundled payment model of reimbursement approaches
- Reduced mortality with PD vs HD for the initial year(s) of therapy
- Recent improvement in 1 year PD outcomes with strategies being developed to further improve the outcomes of PD patients
- The problem of the change in relative mortality rates of PD vs HD with time and problems with encapsulating peritoneal sclerosis

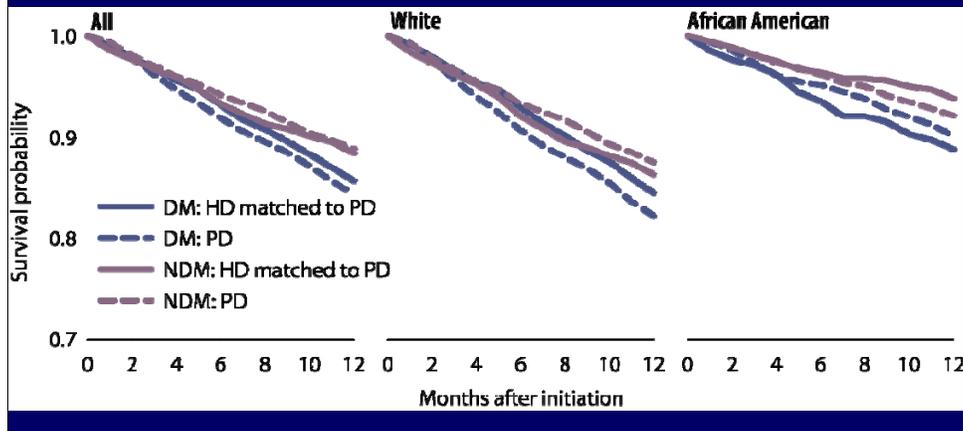
Recent changes in our understanding of PD – covered in other lectures in this series but briefly summarized in subsequent 4 slides. These observations makes the low PD utilization somewhat perplexing and should stimulate an interest in the growth of PD and an interest in how PD programs are organized.

Decline in Mortality Over Time: Striking Decline in Mortality of PD Patients in Recent Years USRDS 2010



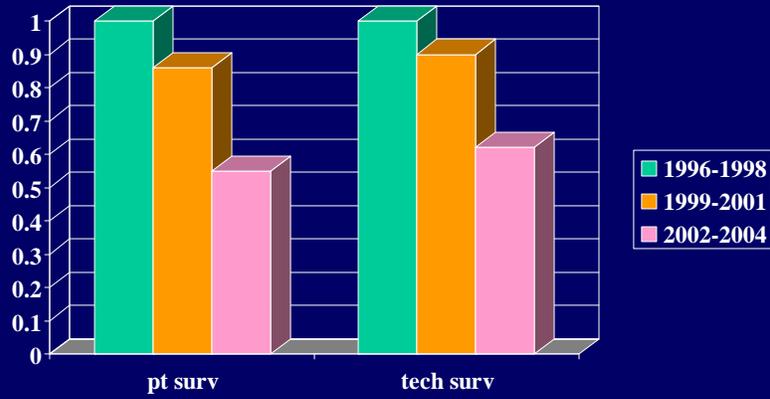
Dramatic drops in mortality over time for PD in recent years— more dramatic than for HD patients.

Unadjusted survival in 2007 dialysis patients, using propensity-matched modality data, by race & diabetic status: USRDS 2010



Propensity matching data from USRDS suggesting no significant differences in mortality in PD vs HD

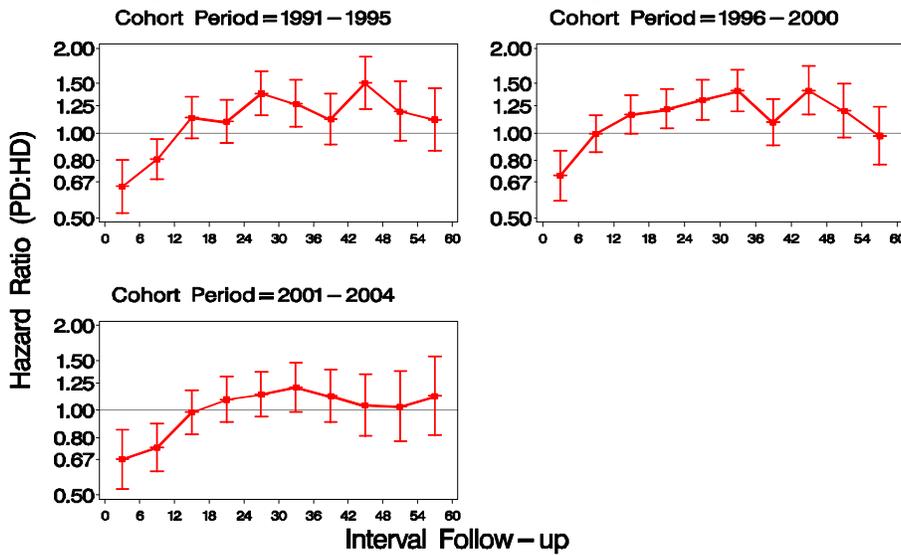
Relative Patient and Technique Survival,
Intent-to-Treat Model USRDS Database
42,803 CAPD and 23,345 APD patients
(Mehrotra, KI 76:97, 2009)



Relative risk of patient survival and technique failure in patients from different time frames. Note marked drop in risk of death and technique failure in the more recent years.

Canadian Registry: Yeates et al: Presented at NAC (ISPD) Meeting Vancouver, 8/09: PD: N =14,308 ; HD: N = 32,531

ITT Adjusted Hazard Ratios by Cohort Period



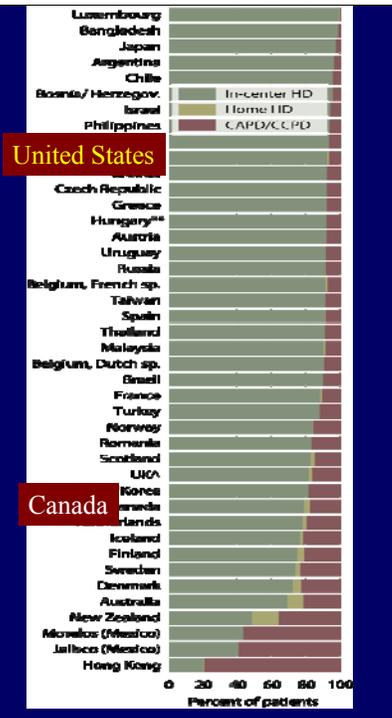
Change in relative risk of death with duration of therapy from the Canadian Dialysis Registry. Note the lower RR of death in the initial months of therapy with PD and a relative improvement in the increased mortality with PD vs HD with increasing duration of therapy in the most recent cohort.

The Low Level of PD Utilization is Puzzling:
additional reasons

- International comparisons
- National variations
- Nephrologists perceptions of what the patient distribution should be
- Patient perceptions of what they want

International Comparisons:
% of patients on peritoneal dialysis

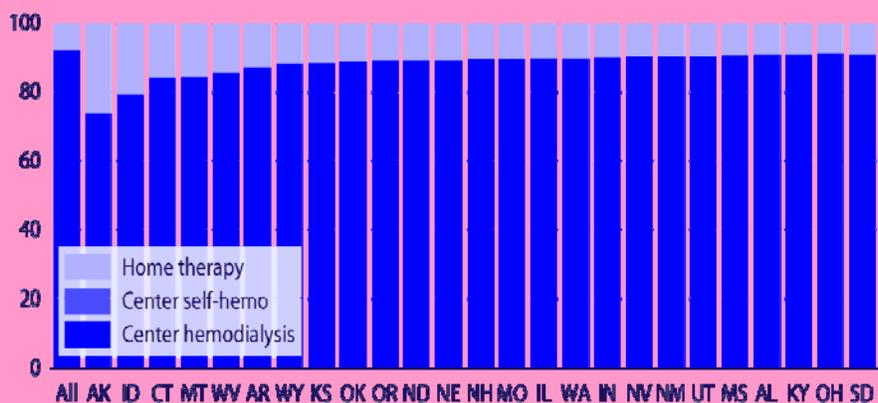
USRDS: 2010



% of prevalent patients maintained on PD is much higher in many countries

Percent distribution of prevalent dialysis patients in the top 25 states for home therapy, 2005

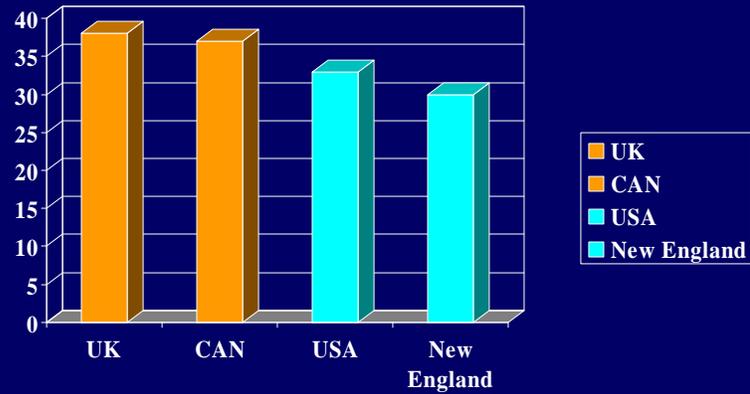
USRDS, 2007



December 31 point prevalent patients, 2005. Excludes patients on other forms of peritoneal dialysis, those whose type of dialysis is unknown, & those residing in Puerto Rico & the Territories. Home therapy: home hemodialysis, CAPD, & CCPD combined.

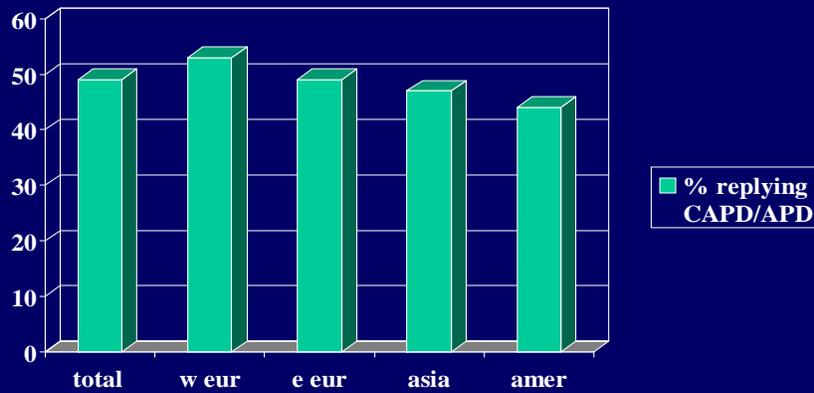
Great variability in % of ESRD patients maintained on PD in different states in the United States

THE % OF ESRD PATIENTS THAT SHOULD BE ON CPD: THE NEPHROLOGISTS VIEW



Data taken from 4 different studies from 2000 to 2010. Nephrologists are asked what % of ESRD patients should be maintained on PD

Nephrology Staff Replying CAPD/APD to the Question: *What do you consider to be the best dialysis initial treatment for a 65 year old patient with 1 comorbidity*
Lebedo and Ronco: NDT Plus, 2008



Similar answers from different parts of the world

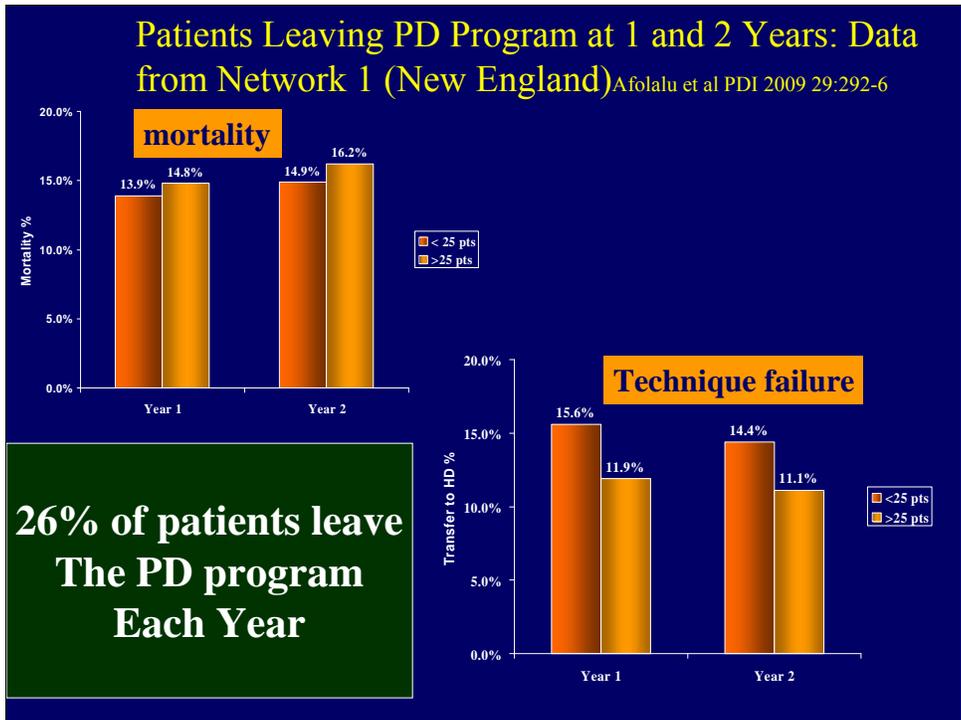
**The Problem of low PD
Utilization, at least in part,
Relates to Problems with the
Structure and Organization of PD
Facilities**

Let's Review the Key Issues

Structural Requirements For A Successful CPD Program (Finkelstein: Kidney Int Suppl. 2006 103:S118-21)

- Development of robust and effective CKD education programs

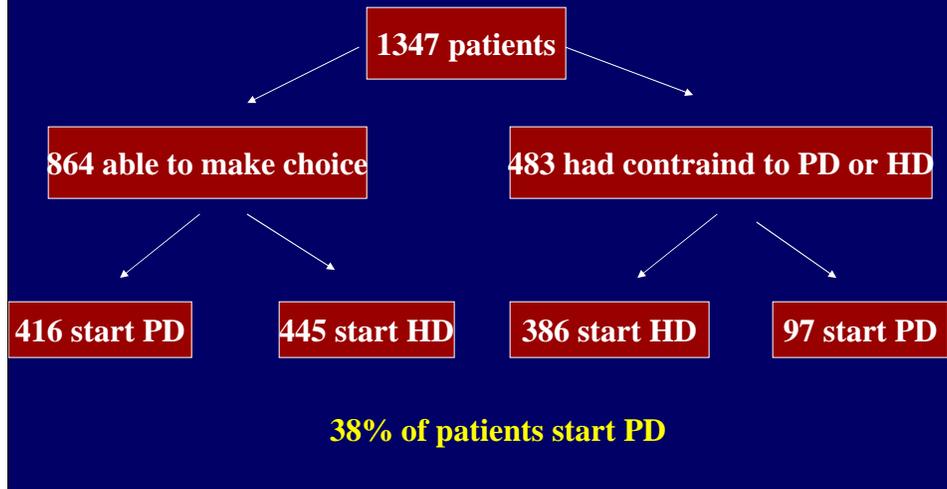




Remember that 26% of patients leave the PD program each year because of mortality, transplant or technique failure. Thus, you need a continuous influx of new patients to maintain census size.

PATIENT PREFERENCE IN DIALYSIS SELECTION: NECOSAD 1997-2001

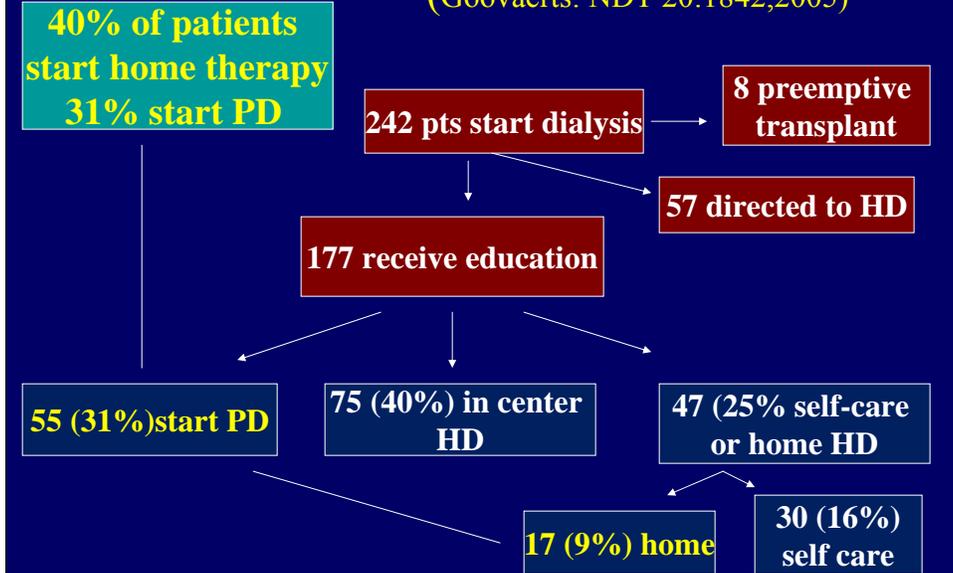
(Jager: AJKD 43:891,2004)



CKD education influences modality selection. Dutch Database examining patient selection – well developed CKD education programs

CKD Education and Modality Selection: Belgium: 40% of patients Start Home Dialysis

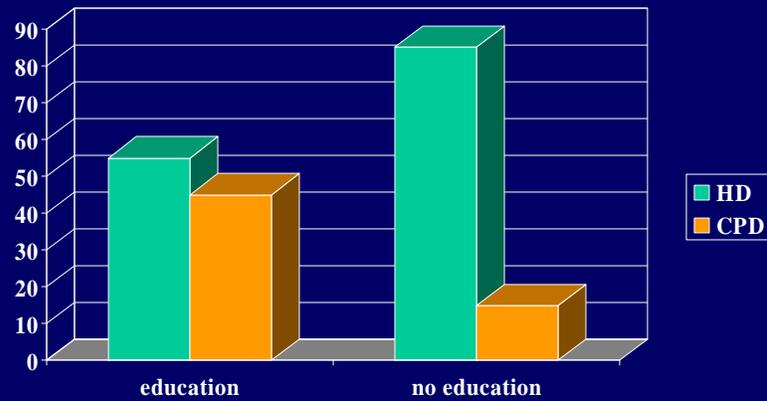
(Goovaerts: NDT 20:1842,2005)



CKD education influences modality selection. Belgium: another example of well developed CKD education programs and % of patients opting for home dialysis

PATIENT MODALITY SELECTION: THE IMPACT OF CKD EDUCATION

(New Haven CAPD-2002-2006: 50% of New Dialysis starts
Receive CKD education)



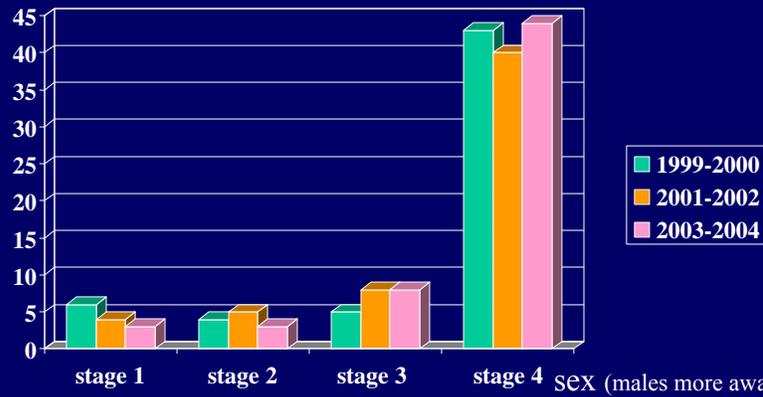
CKD education influences modality selection. New Haven Experience (unpublished): Education results in much higher % of patients starting PD

There are Major Deficiencies in Providing CKD Education

- Lack of knowledge of CKD patients that they even have CKD
- Lack of knowledge about CKD
- Lack of knowledge about modality selection

Patient Awareness of CKD: NHANES Data

Plantinga et al: Arch Int Med 108:2268, 2008



Factors Impacting on Awareness: race (AA, Hisp more aware), sex (males more aware), diabetes (diab more aware), BP (incr BP more aware), obesity (obese pts more aware)
Factors Not Impacting Awareness: education, age, health insurance

Few patients with Stage 3 CKD realize they have CKD and less than 1/2 of Stage 4 CKD patients realize they have CKD. Note the lack of improvement in patient knowledge over time.

**CKD PATIENT KNOWLEDGE:
The CRIOS Study: 7 Sites in Canada and U.S.**
(Finkelstein et al: *Kidney Int*, 74:1178-84, 2008)

- CKD patients (25% stage 3, 56% stage 4, 19% stage 5) were asked to complete a self administered questionnaire of 30 questions to determine knowledge of CKD and renal replacement therapies.
- 708 patients completed the questionnaire and had clinical and laboratory data available to analyze
- The median age was 65.8 years, 73.4 % were Caucasian, 45.3% were diabetic.
- Patients had been seeing their Nephrologist for a mean of 5.2 years and 65% were seen by a Nephrologist for > 1 year

Study examining the degree of knowledge of CKD patients about CKD and Modality Selection

Percent of CKD Patients With No Knowledge of Various ESRD Therapies

No knowledge of HD	43%
No knowledge of CAPD	57%
No knowledge of APD	66%
No knowledge of transplantation	56%
No knowledge of Any modality	35%

From Finkelstein et al: Kidney Int, 74:1178-84, 2008

Frequency of Nephrology Visits and Number of Patients with Knowledge of ESRD Therapies

# of Visits in Preceding Year				
	0-1	2-3	>=4	p-value
Knowledge of HD	40.4%	58.4%	64.3%	<0.001
Knowledge of CAPD	25.2%	43.2%	50.8%	<0.001
Knowledge of Transplant	45.2%	55.9%	63.7%	0.003

From Finkelstein et al: *Kidney Int*, 74:1178-84, 2008. Many patients seeing nephrologists for 4 or more visits in preceding year had little knowledge of various modalities.

Realities in the Current World of CKD Education

- Over 1/3 of incident ESRD patients, when questioned, report not knowing they had kidney disease
- The majority of CKD patients report not knowing they have kidney disease
- CKD patients seeing nephrologists know surprisingly little about CKD or ESRD treatment options
- 80% of incident HD patients start dialysis with a catheter
- Most dialysis patients do not understand the key factors impacting on outcomes

CKD Education: CMS Guidelines for Stage IV CKD Patients

- Educator services “are designed to provide beneficiaries with comprehensive information regarding management of co-morbidities, including for purpose of delaying the need for dialysis; prevention of uremic complications; and each option for renal replacement therapy (advantages and disadvantages).”
- “... the beneficiary .. (should) actively participate in his/her choice of therapy.”
- “(Educators) will develop outcome assessments ... To measure beneficiary knowledge about CKD and its treatment.”
- Individual or group sessions funded but no more than 6 sessions in a patient’s lifetime

CKD education is now covered by CMS in the United States. An exciting opportunity for CKD centers and nephrologists in the U.S.

Educational Interventions in ESRD and CKD Patients (Mason et al: AJKD 51:933, 2008)

- Comprehensive search for randomized trials of structured educational interventions in CKD and ESRD patients
- 22 studies identified
- The majority involved diet and/or fluid status in dialysis patients: nothing more
- **Only one study** involved long term study of CKD patients not on dialysis (Devins et al, AJKD 2003, 2005)

Review article concerning CKD education.

Purpose of Patient CKD Education: what are we trying to accomplish?

- Improve outcomes of CKD:
 - a) slow progression
 - b) reduce CV risk
- Improve outcomes after the start of dialysis
- Provide information about modality selection concerning ESRD

Remember the purpose of CKD education

Communication Breaks Down

- Patients do not hear or understand what the physician is saying
- The physician does not hear what the patient is saying

**The Problem With CKD Education Is
Not Just That It Is Not Offered BUT
That Is Not Done Effectively**

- Traditional response to problems with patients about communication and change: give information and knowledge and expect patients to learn
- Current challenge: Revamp CKD education programs, focusing on change – addressing the issues of how individuals change their behavior or cope with changes in their living situation

**PHYSICIAN (Nephrologist) BARRIERS TO
REFERRAL TO CKD EDUCATION PROGRAM**

(New Haven Experience)

- Concern about patient fear and denial –
 - refusal to go
 - referred and did not make contact
- Late referral by primary care physician
- Physicians perception that referrals were not necessary

Patient Barriers to Education

Munch: the Scream: 1896

- What do patients hear when ESRD care is discussed?
- It is easy to speculate
- But, to date, no studies have critically examined this question



THE SCREAM

Newer Approaches

- Recognition that modifying or changing behavior is a challenge
- Learn techniques that enhance an individual's motivation to change.
- Apply techniques from motivational interviewing and cognitive behavioral therapy (logical and decision making analysis)

Empowering the Patient: The techniques enhance the individual's ability to better understand their decision making and problem solving

Structural Requirements For A Successful CPD Program

- Development of robust and effective CKD education programs
- Development of appropriate support systems
 - nursing
 - social work
 - dietary

NURSE'S ROLE: CRITICAL FOR SUCCESS

- Adequate nursing support to handle basic problems
- Adequate expertise in managing PD related problems
- Nursing coordination of various aspects of care, such as peritonitis, catheter and exit site care, anemia management, etc
- *Adequate nursing staff to take night and weekend call*
- Bernadini et al: (PDI 26:658, 2006) North/South America, Europe, South Africa, HK) reports on various aspects of nursing care, including site of training, training time for patients, timing of training, etc

Well trained, competent, dedicated, independent nurses are the key to a successful PD program

SOCIAL WORK ROLE:

An Integral Role in the Program

(Wuerth: Seminars in Dialysis,2006)

- Assess family functioning
- Assess caregiver burden
- Assess patient's ability to cope with demands of home therapy
- Provide patient/family support and assess for possible areas of psychosocial intervention, e.g. clinical depression
- Function as a liaison between the medical care team and the patient and family system

Must play an integral role in the program and this involves addressing the psychosocial needs of patients



RISK OF PERITONITIS IN CPD PATIENTS

(based on 281 BDI scores – peritonitis episodes in 6 months after each BDI) (Wuerth et al AJKD 42:350, 2003)

Variable	Relative risk*	95% confidence intervals
BDI \geq 11	2.7	1.23-6.03
Age \geq 65	0.8	0.29-1.88
Diabetes	1.0	0.46-2.13
CAD	0.6	0.39- 1.23

* Multivariate analysis

An example of how psychosocial factors impact on outcomes of PD patients. Patients with high BDI scores have a 2.7 fold greater chance of developing peritonitis.

BDI = Beck Depression Inventory

DIETICIAN'S ROLE

- Dietary instruction
- Critical role of sodium restriction in maintaining cardiovascular health
- Tracks and advises patients concerning:
 - a) albumin levels/protein intake
 - b) phosphate levels
 - c) potassium levels
 - d) weight gain or loss

Structural Requirements For A Successful CPD Program (Finkelstein: Kidney Int Suppl. 2006 103:S118-21)

- Development of robust and effective CKD education programs
- Development of appropriate support systems
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- Development of appropriate CQI programs to monitor a variety of domains (discussed in PD K/DOQI guidelines, 2006, AJKD, 2006)

It is essential to track individual facility outcomes and compare them to local, national and international outcomes.

DEVELOPMENT OF EFFECTIVE CQI PROGRAM (K/DOQI PD Guidelines, AJKD, 2006)

- Morbidity and mortality
- Peritonitis rates
- Exit site infection rates
- Catheter problems
- Quality of life of patients and their family
- Patient satisfaction with care
- Other domains

It is essential to track individual facility outcomes and compare them to local, national and international outcomes.

Structural Requirements For A Successful CPD Program (Finkelstein: Kidney Int Suppl. 2006 103:S118-21)

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- Development of appropriate CQI programs to monitor a variety of domains (discussed in PD K/DOQI guidelines, 2006, *AJKD*, 2006)
- **Appropriate size of PD program**

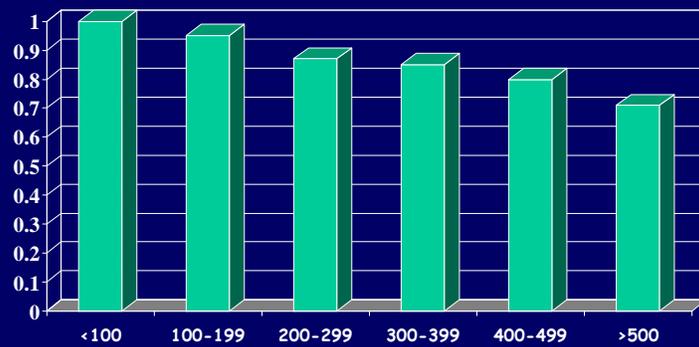
NUMBER OF PD PATIENTS IN A TYPICAL U.S. DIALYSIS CENTER

Total # Pts In Unit	# of Units	% of total	# Pts in group	% of total Pts
>50 pts	59	4.4%	4,158	19.6%
21 to 50 pts	290	21.6%	9,323	44.1%
11 to 20 pts	370	22.8%	4,588	21.7%
6 to 10 pts	249	18.5%	1,938	9.2%
1 to 5 pts	439	32.7%	1,156	5.5%
1,407 units with at least 1 PD patient			36% of pts in units with <20 pts	

(data from Baxter-2009)

Most units in the U.S. are small with less than 10 patients

Adjusted relative risk of death by
cumulative number of PD patients treated
in an individual facility

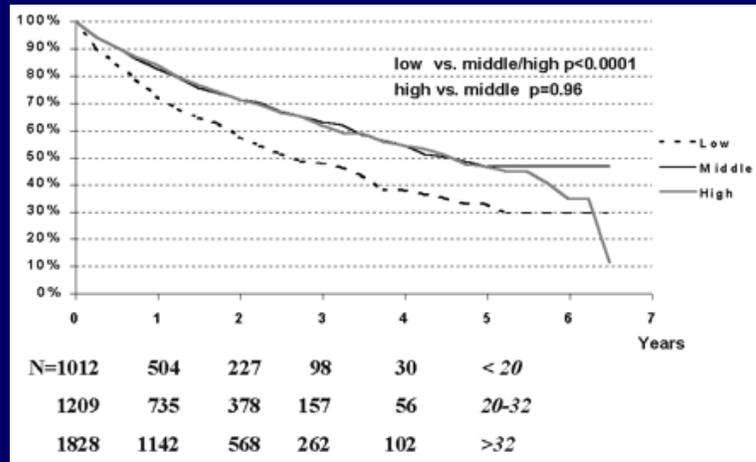


Schaubel KI 2000 60:1517-1524

The greater the experience the lower the mortality rate

Center Size and Technique Failure (Dutch Registry)

Huisman Nephrol Dial Transplant 2002; 17: 1655-1660

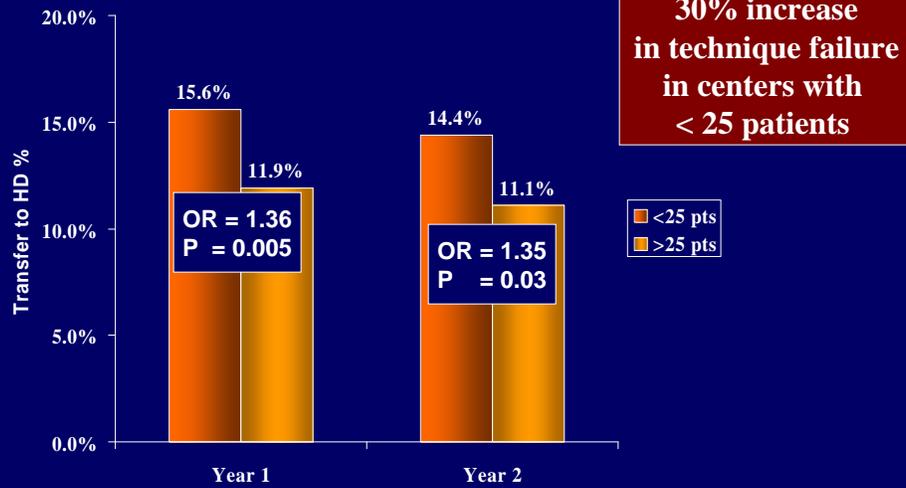


Low: <20 pts, n=1012 Medium 20-32 pts n=1209,
High >32 patients, n=1142

Technique failure rate correlates with size of the program— centers with < 20 patients had highest technique failure rates

Technique Failure at 1 and 2 Years in Network 1 (New England) By Center Size (\geq or $<$ 25 patients)

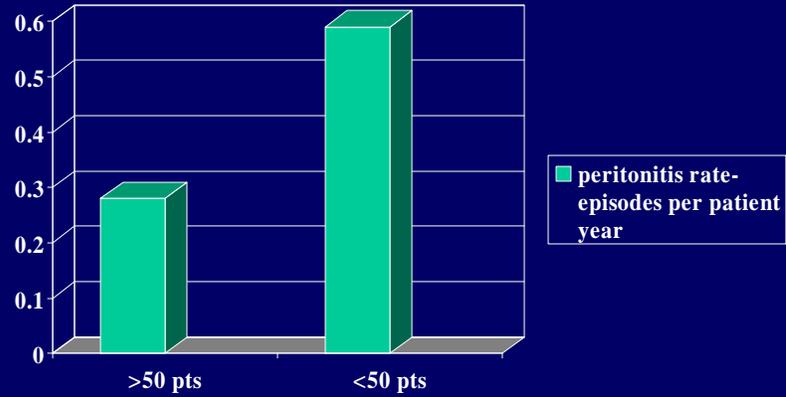
(Afolalu et al: PDI 29:292, 2009)



Higher technique failure rate in patients coming from units with less than 25 patients; confirming findings from Gao and Mujais (KI 64 S3,2003) indicating higher technique failure rate in units with < 20 patients

Peritonitis Rates in Dialysis Units The CHOICE Study

Plantinga L et al Perit Dial Int, 29: 285-291, 2009



Results are the same when corrected for age, sex, race, comorbidity, BMI, diabetic status

Higher peritonitis rates in patients cared for in units with < 50 patients

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 - dietary
- Development of appropriate CQI programs to monitor a variety of domains (discussed in PD K/DOQI guidelines, 2006, *AJKD*, 2006)
- Appropriate size of PD program
- **Physician training**

Health Care Provider Education

- Expand training options for physicians and nurses:
the poor training of nephrology trainees in PD therapy is now well documented
- Dispel myths and focus on positive aspects of PD
 - a) increased mortality: (already discussed)
 - b) satisfaction with therapy
 - c) problems with PD for the elderly ??

PATIENTS' GLOBAL PERCEPTION OF THEIR CARE: THE CHOICE STUDY

(Rubin et al: JAMA. 2004 291:697-703)

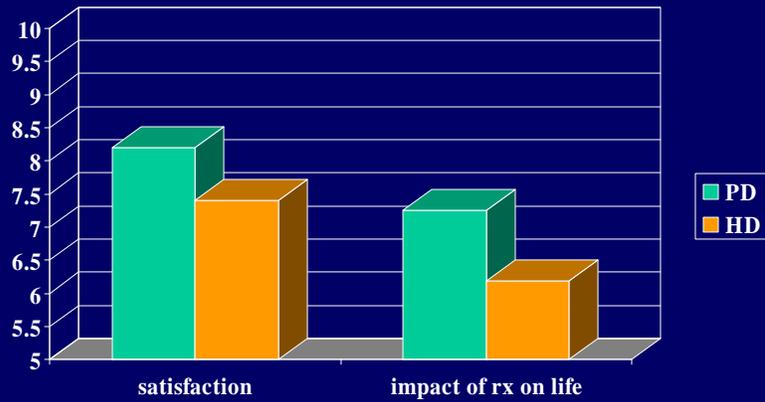
	Quality of dialysis care	How much could be better*	Would you recommend your center
% exc ratings: PD	85%	60%	91%
% exc ratings: HD	56%	39%	75%
Adj prob PD/HD	1.46	1.70	1.20

% of best possible response

HD and PD patients report on their satisfaction with their care: patients are more satisfied with PD than HD

GLOBAL PATIENT SATISFACTION WITH AND IMPACT OF THERAPY

(Juergensen et al: CJASN 2006 1:1191-6)

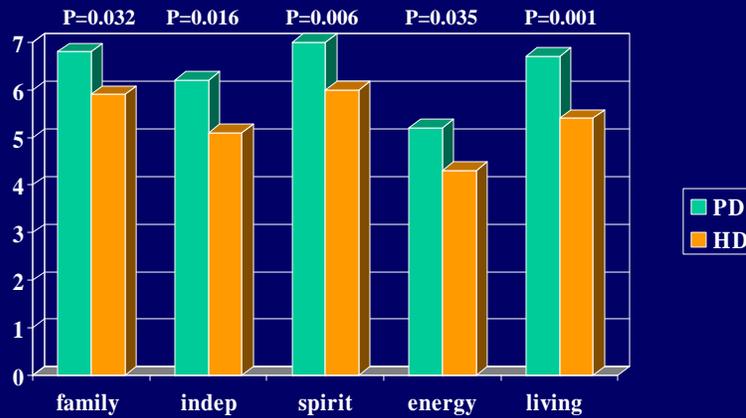


On multivariate analysis, the only significant difference was attributable to modality

150 prevalent patients rate PD as being more satisfying than HD and having less of a negative impact on their life. Patient scores are on a 1-10 Likert scale.

Data from New Haven

DOMAINS WITH SIGNIFICANT DIFFERENCES (Juergensen et al: CJASN 2006 1:1191-6)



PD PATIENTS SCORE HIGHER ON 16 OF 17 DOMAINS

16 different domains evaluated and PD patients rated less of a negative impact of their treatment on these domains than HD patients.

Data from New Haven

Structural Requirements For A Successful CPD Program: Summary

- Development of robust and effective CKD education programs
- Development of appropriate support systems
 - nursing
 - social work
 - dietary
- Development of appropriate CQI programs to monitor a variety of domains (discussed in PD K/DOQI guidelines, 2006, *AJKD*, 2006)
- Appropriate size of PD program
- Physician training

Question #1

- Nephrologists think that what % of ESRD patients should be on PD?
 - A. 10%
 - B. 30-40%
 - C. 60%
 - D. 80%
 - E. None of the above

Question #1 – Answer: B

Question #2

- If patients are have seen nephrologists 4x or more if the last year, what % report knowing about CAPD?
 - A. 10%
 - B. 25%
 - C. 50%
 - D. 75%
 - E. 90%

Question #2 – Answer: C

Question #3

- Which are of the following are associated with an increased frequency of peritonitis in PD patients?
 - A. Beck Depression Inventory scores of 11 or greater
 - B. Presence of CAD
 - C. Presence of diabetes
 - D. Age of 65 or greater
 - E. All of the above

Question #3 – Answer: A