Update on Peritoneal Dialysis: New Positioning of an Older Therapy

Steven Guest, MD
Director, Medical Consulting Services
Baxter Healthcare Corporation
Deerfield, Illinois, USA
Underutilization of Peritoneal Dialysis

% Prevalent Patients on PD

- Jalisco (Mexico): 49.4%
- New Zealand: 33.2%
- Netherlands: 15.8%
- Denmark: 20.0%
- Canada: 17.1%
- United States: 7.4%

U.S. Renal Data System. USRDS 2013 Annual Data Report.
Peritoneal Clearance

Image courtesy of Steve Guest, MD
Incidence of ESRD

Incident ESRD patients.
Adj: gender/race; ref: 2010 ESRD patients.
Similar Outcomes- PD and HD

ORIGINAL INVESTIGATION

ONLINE FIRST

Similar Outcomes With Hemodialysis and Peritoneal Dialysis in Patients With End-Stage Renal Disease

Rajnish Mehrotra, MD; Yi-Wen Chiu, MD; Kamyar Kalantar-Zadeh, MD; Joanne Bargman, MD; Edward Vonesh, PhD

Background: The annual payer costs for patients treated with peritoneal dialysis (PD) are lower than with hemodialysis (HD), but in 2007, only 7% of dialysis patients in the United States were treated with PD. Since 1996, there has been no change in the first-year mortality of HD patients, but both short- and long-term outcomes of PD patients have improved.

Methods: Data from the US Renal Data System were examined for secular trends in survival among patients treated with HD and PD on day 90 of end-stage renal disease (HD, 620,020 patients; PD, 64,406 patients) in three 3-year cohorts (1996-1998, 1999-2001, and 2002-2004) for up to 5 years of follow-up using a nonproportional hazards marginal structural model with inverse probability of treatment and censoring weighting.

Results: There was a progressive attenuation in the higher risk for death seen in patients treated with PD in earlier cohorts; for the 2002-2004 cohort, there was no significant difference in the risk of death for HD and PD patients through 5 years of follow-up. The median life expectancy of HD and PD patients was 38.4 and 36.6 months, respectively. Analyses in 8 subgroups based on age (<65 and ≥65 years), diabetic status, and baseline comorbidity (none and ≥1) showed greater improvement in survival among patients treated with PD relative to HD at all follow-up periods.

Conclusion: In the most recent cohorts, patients who began treatment with HD or PD have similar outcomes.

Arch Intern Med. Published online September 27, 2010. doi:10.1001/archinternmed.2010.352

Catheter Use at First Outpatient HD

![Bar chart showing catheter use at first outpatient HD.](image)
Medicare Spending Per Patient Year by Type of Renal Replacement Therapy

- Hemodialysis: $87,945
- Peritoneal dialysis: $71,630
- Transplant: $32,922

$49.3 BILLION total costs per year for ESRD patient care
Costs of Caring for Patients with ESRD

1.4% of Medicare patients have ESRD

They account for 7.2% of Medicare spending

ESRD: 429,000 patients

$25.6 billion

1%

TOTAL MEDICARE SPENDING $355 BILLION
Changes in Dialysis Reimbursement to Providers in the USA

REVIEW

HOME DIALYSIS IN THE NEW USA BUNDLED PAYMENT PLAN: IMPLICATIONS AND IMPACT

Thomas A. Golper,1* Steven Guest,2 Joel D. Glickman,3 Joe Turk,4 and Joseph P. Pulliam5

Vanderbilt University Medical Center,1 Nashville, Tennessee; Baxter Healthcare,2 McGaw Park, Illinois; University of Pennsylvania,3 Philadelphia, Pennsylvania; NxStage Medical,4 Lawrence, Massachusetts; Fresenius North America,5 Portland, Oregon, USA

On 1 January 2011, a new payment system for Medicare patients will be implemented in the United States. This new system bundles services previously charged separately and under a “fee for service” environment. The authors discuss the implications of this approach. Over the next several pages is a response by American physicians and dialysis innovators to a federal initiative to change the way dialysis is paid for in the United States. Peter Blake, the Editor-in-Chief of Peritoneal Dialysis International, invited Thomas Golper to articulate physicians’ concerns with this new payment scheme. After the government of the USA closed its comment period over the new payment methodology, called rate adjusted for both geographic location of the dialysis unit and patient characteristics, and (2) an “add on” portion for separately billable medications administered intravenously during the dialysis session. Dialysis facilities caring for peritoneal dialysis (PD) patients receive a daily per treatment payment, which over a week is equivalent to three times the applicable HD composite rate. Facilities are also entitled to submit for reimbursement of separately billable intravenous, subcutaneous, and intraperitoneal drugs administered at the facility, as well as patients’ self-administered erythropoiesis-
The “Bundle”

Dialysis Reimbursement in 2011 Environment of a full bundle
inclusion of the separately billable drugs and services

Profitability will be influenced by efficiencies and resources
sparing therapies to better manage provider costs.
Underutilization of Peritoneal Dialysis

% Prevalent Patients on PD

<table>
<thead>
<tr>
<th>Country</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Jalisco (Mexico)</td>
<td>49.4%</td>
</tr>
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<td>Canada</td>
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</tr>
<tr>
<td>United States</td>
<td>7.4%</td>
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</tbody>
</table>

U.S. Renal Data System. USRDS 2013 Annual Data Report.
Most Patients Are Medically Eligible for PD

>1000 ESRD Patients Starting Dialysis

<table>
<thead>
<tr>
<th></th>
<th>% Medically Eligible for PD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netherlands¹</td>
<td>83%</td>
</tr>
<tr>
<td>U.S.²</td>
<td>76%</td>
</tr>
</tbody>
</table>

The prevalence of medical contraindications to PD (23% to 24%) is similar to the 17% to 21% reported ... from other parts of the world.²

# Surveys of Nephrologists

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>% of ESRD patients nephrologists feel should be on PD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA(^1)</td>
<td>2006</td>
<td>29%</td>
<td>59</td>
</tr>
<tr>
<td>USA(^2)</td>
<td>2001</td>
<td>33%</td>
<td>240</td>
</tr>
<tr>
<td>Canada(^3)</td>
<td>1999</td>
<td>37%</td>
<td>192</td>
</tr>
<tr>
<td>British Isles(^4)</td>
<td>2002</td>
<td>38%</td>
<td>108</td>
</tr>
</tbody>
</table>

Lifestyle Considerations of PD

Home based
Avoids needles
With cycler machines- exchanges done at night time
Travel, portability
Flexible scheduling, day to day to allow for dialysis to revolve around the life schedule, not life revolving around HD schedule

Challenges
• Storage of product
• Fear of doing medical procedure at home
Patient Response - “I could never do that”

Driving analogy
The Importance of Patient Education

After Pre-ESRD Education, 45% Chose PD and 33% Actually Started PD

The National Pre-ESRD Education Initiative Survey

Effect of an In-Hospital Chronic Kidney Disease Education Program among Patients with Unplanned Urgent-Start Dialysis

Jean-Philippe Rioux, Harpaul Cheema, Joanne M. Bargman, Diane Watson, and Christopher T. Chan

Summary
Background and objectives The effect of in-hospital education on the adoption of home dialysis (peritoneal dialysis [PD] and home hemodialysis [HHD]) after an unplanned dialysis start is unknown.

Design, setting, participants, & measurements Clinical demographics of consecutive patients acutely initiating hemodialysis (HD) from January 2005 to December 2009 were abstracted using institutional electronic records. All patients received multimedia chronic kidney disease education by the same advanced care nurse practitioner before discharge from the hospital. Clinical characteristics of patients choosing home dialysis or staying on in-center HD were compared.

Results Between 2005 and 2009, 228 patients acutely started renal replacement therapy (RRT) at the center. Seventy-one patients chose home dialysis (49 patients adopted PD and 22 adopted HHD), 132 chose to remain on in-center HD, and 25 died before discharge from the hospital. Patients adopting home dialysis tended to be younger than in-center HD patients (55 ± 18 [home dialysis] versus 59 ± 16 [in center] years; P = 0.09) and were similar in gender distribution (49% [home dialysis] versus 56% [in center] male; P = 0.2). Patients adopting home dialysis were more likely to have a failed kidney transplant (24% [home dialysis] versus 12% [in center]; P = 0.045) and less likely to have ischemic nephropathy (9% [home dialysis] versus 21% [in center]; P = 0.03). The distribution of comorbid conditions was different between patients adopting home dialysis and in-center HD.

Conclusions Home dialysis is feasible after urgent dialysis start. Education should be promoted among patients experiencing acute-start dialysis.

Patients’ flow through the study

228 Acute Start Between 2005-2009

Education program before discharge

132 In-center HD
71 Home
25 Died (before discharge)

49 PD
22 HHD

Physician Preference For Modality

Insights into nephrologist training, clinical practice, and dialysis choice

Joseph R. MERIGHI,1 Dorian R. SCHATELL,2 Jennifer L. BRAGG-GRESHAM,2 Beth WITTEN,2 Rajnish MEHROTRA3,4
1School of Social Work, Boston University, Boston, Massachusetts, USA; 2Medical Education Institute, Inc., Madison, Wisconsin, USA; 3Los Angeles Biomedical Research Institute at Harbor-UCLA, Torrance, California, USA; 4David Geffen School of Medicine at UCLA, Los Angeles, California, USA

Abstract
There is variable emphasis on dialysis-specific training among US nephrology fellowship programs. Our study objective was to determine the association between nephrology training experience and subsequent clinical practice. We conducted a national survey of clinical nephrologists using a fax-back survey distributed between March 8, 2010 and April 30, 2010 (N = 629). The survey assessed the time distribution of clinical practice, self-assessment of preparedness to provide care for dialysis patients at the time of certification examination, distribution of dialysis modality among patients, and nephrologists' choice of dialysis modality for themselves if their kidneys failed. While respondents spent 28% of their time caring for dialysis patients, 38% recalled not feeling very well prepared to care for dialysis patients when taking the nephrology certification examination. Sixteen percent obtained additional dialysis training after fellowship completion. Only 8% of US dialysis patients use home dialysis; physicians very well prepared to care for dialysis patients at the time of certification or who obtained additional dialysis training were significantly more likely to provide care to home peritoneal dialysis patients. Even though 92% of US dialysis patients receive thrice weekly in-center hemodialysis, only 6% of nephrologists selected this for themselves; selection of therapy for self was associated with dialysis modalities used by their patients. Nephrology training...
Distribution of nephrologists’ modality choice for themselves

What is current status of PD in USA?

Select practice advances
Infectious complications
Surgical approaches
PD in the late-referred patient
Integrated care approach
Tenckhoff Modifications to Boen Technique

Figure 7 – Modification of Boen’s peritoneal dialysis system developed by Dr. H. Tenckhoff at the University of Washington in Seattle.

Boen’s Portable Cycler—U Washington

Home Peritoneal Dialysis

Baxter Museum, Largo Florida
Older Cyclers- PAX Extra
Current Cycler Machines

Rx Only. For safe and proper use of these devices refer to respective operator’s manual.
Dialysis Completed at Night
Univ. of Pittsburgh-Infection Rates Reduced In PD As Innovations and Protocols Are Introduced

**Mupirocin Prophylaxis**

<table>
<thead>
<tr>
<th>Study</th>
<th>Reduction in Relative Risk of Exit-Site Infection*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perez 1993</td>
<td>-67%</td>
</tr>
<tr>
<td>Thodis 1998*</td>
<td>-86%</td>
</tr>
<tr>
<td>Crabtree 2000</td>
<td>-60%</td>
</tr>
<tr>
<td>Thodis 1998†</td>
<td>-10%</td>
</tr>
<tr>
<td>Overall</td>
<td>-62%†</td>
</tr>
</tbody>
</table>

*Risk of exit-site infection, mupirocin : without mupirocin.
†P < 0.01 vs. placebo or no treatment.

Rates of Exit-Site Infection (ESI) in PD

Gentamicin Prophylaxis

Reduced Gram-negative Infections in PD

*P < 0.01 vs. mupirocin
Peritonitis Outcomes

Percent (%) of All Episodes (N = 666)

CoagNS = coagulase-negative staphylococci; nP-GNR = non-pseudomonal gram negative

Reduce Infections

- Adequate training time
- Protocols (Hand washing, masks)
- Flush before fill
- Exit site topical antibiotics
- Exit site location
- Alcohol based hand washes or dilute bleach solutions
Probability of Remaining Free of Mechanical Flow Obstruction At 24 Months Significantly Increased by Newer Techniques

High Catheter Survival In PD

- Open Laparomy: 82.5%
- Basic Laparoscopic: 87.2%
- Advanced Laparoscopic: 99.5%

P < 0.0001 vs. open or basic technique
Adjunctive Laparoscopic Procedures

Rectus sheath tunneling before entering the peritoneal cavity
Rectus Sheath Tunneling
Redundant Omentum

Omental Wrap

Pelvis

Redundant Omentum

Courtesy of John Crabtree MD
Omentopexy
Minimally Invasive Surgery
Effective use of laparoscopy for long-term peritoneal dialysis access

John H. Crabtree, M.D.\textsuperscript{a,}* Raoul J. Burchette, M.S.\textsuperscript{b}

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Table 1  Demographics and clinical details of laparoscopically implanted peritoneal dialysis catheters

<table>
<thead>
<tr>
<th>Patient demographics (n = 428)</th>
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<tbody>
<tr>
<td>Age (mean ± SD) (y)</td>
<td>54.8 ± 14.1</td>
<td></td>
</tr>
<tr>
<td>Male (%)</td>
<td>215 (50.2)</td>
<td></td>
</tr>
<tr>
<td>Body mass index (mean ± SD) (kg/m(^2))</td>
<td>29.5 ± 6.6</td>
<td></td>
</tr>
<tr>
<td>Previous intra-abdominal surgery (%)</td>
<td>244 (57.0)</td>
<td></td>
</tr>
<tr>
<td>Postsurgical follow-up (mean ± SD) (mo)</td>
<td>21.6 ± 18.8</td>
<td></td>
</tr>
</tbody>
</table>

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Figure 3  Cumulative revision-free and assisted catheter survival probabilities for loss from mechanical complications. Censored subjects appear as data point symbols on the flat part of the curves.

Laparoscopy Permits Diagnosis of Unsuspected Hernias

- Patent Processus Vaginalis (Male)
- Recurrent Direct Inguinal Hernia
- Patent Processus Vaginalis (Female)
- Spigelian Hernia

Courtesy of John Crabtree MD
Exit Site Location to Suit Special Needs

- Body habitus
- Occupations or responsibilities that require bending at the waist
- Factors affecting infection risk: stoma, fecal incontinence
Chronic Infection - Poor Exit-Site Location
Extended Dialysis Catheter System

A. Missouri catheter is standard with kit
B. Presternal extension tube
C. Substituted Tenckhoff catheter
D. Titanium connector
Catheters cut to appropriate length

Joined with titanium connector and 2-0 polypropylene suture.

Courtesy of John Crabtree MD
Obese Abdomen with Exit-Site Out of Sight and Under Belt Line

Preoperative

Postoperative

Courtesy of John Crabtree MD
Presternal Exit-Site is Easily Visualized and Remote from Urostomy
Presternal Exit-Site
Advanced Planning
Instructional DVD, 2nd Edition

Implantation Techniques for Peritoneal Dialysis Catheters
An Instructional Program for Healthcare Providers

John Crabtree MD
Kaiser Permanente Bellflower, CA
Funded and Distributed by Baxter Healthcare Corporation
Peritoneal Dialysis University for Surgeons
www.pdusurgeons.com

Didactic Instruction:
• Introduction for surgeons to concepts, issues and economics of PD
• Preoperative assessment, planning, and preparation
• Implantation techniques
• Salvage procedures for infectious and mechanical complications

Surgical Laboratory:
• Preoperative mapping for catheter type and exit-site
• Laparoscopic simulator for rectus sheath tunneling
• Laparoscopic simulator for omentopexy
• Simulator for extended catheter placement
• Simulator for embedding catheters
Laparoscopic Simulator

Reusable laparoscopic port sites (to accept 5 mm ports).

Umbilicus

Two reusable holes through this port site for laparoscope or omentopexy needle (one hole to accept 5 mm port and 2nd to accept omentopexy needle.

Reusable rectus sheath tunneling port site (to accept 7-8 mm port).
Probability of Remaining Free of Mechanical Flow Obstruction At 24 Months Significantly Increased by Newer Techniques

High Catheter Survival In PD

- Open Laparomy: 82.5%
- Basic Laparoscopic: 87.2%
- Advanced Laparoscopic: 99.5%

P < 0.0001 vs. open or basic technique
Ultrasound / Fluoroscopic Placement
Peel-away Sheath In Place
Tunnel Creation
Final View
Urgent Start PD Program

Femoral Catheter
IJ temporary or tunneled catheter
Urgent HD

BUN 120
Cr 14
Urgent Start PD

Femoral Catheter
IJ temporary or tunneled catheter
Urgent HD

BUN 120
Cr 14

Urgent PD catheter placement
Urgent-Start Peritoneal Dialysis: A Quality Improvement Report

Arshia Ghaffari, DO, MA, MBA

**Background:** Compared with hemodialysis, peritoneal dialysis (PD) is a cost-effective and patient-centered option with an early survival advantage, yet only 7% of patients with end-stage renal disease in the United States receive PD. PD underutilization is due in part to nephrologists’ unfamiliarity with directly starting PD in patients who present with kidney failure requiring urgent initiation of dialysis.

**Design:** Quality improvement report.

**Setting & Participants:** Single-center study whereby 18 patients who presented urgently with chronic kidney disease stage 5 without a plan for dialysis modality were offered PD as the initial modality of dialysis. Concurrently, 9 patients started on PD therapy nonurgently were included as the comparative group.

**Quality Improvement Plan:** An urgent-start PD program was developed to support and standardize the process by which patients without a plan for dialysis modality were started on PD. This included rapid PD access placement, PD nursing education, and administrative support. Standardized protocols were created for modality selection, initial prescription, and prevention and management of complications.

**Measures:** Short-term (90-day) clinical outcomes (Kt/V, hemoglobin, iron saturation, parathyroid hormone, phosphorus, calcium, and albumin) and complications (peritonitis, exit-site infections, leaks, and catheter malfunction) were compared between the urgent-start and non-urgent-start PD groups.

**Results:** Short-term clinical outcomes were similar between the 2 groups for all parameters except uncorrected serum calcium level, which was lower in the urgent-start group \( (P = 0.02) \). Peritonitis, exit-site infection, catheter-related complications, and other complications were similar between the 2 groups, although the number of minor leaks was higher in the urgent-start group.

**Limitations:** This is a single-center nonrandomized study with a small sample size.

**Conclusions:** Our structured program shows safety and feasibility in starting PD in patients with kidney failure who present without a plan for dialysis modality. The steps laid out in this report can provide the framework for creating local urgent-start PD programs.

“...at our center, the interventional radiology group is the main group placing urgent tunneled HD catheters and therefore was the ideal service for placing urgent PD catheters, essentially substituting one procedure for another...”

Urgent Start PD Program

- Femoral Catheter
  - IJ temporary or tunneled catheter
  - Urgent HD

- BUN 120
- Cr 14

- Urgent interventional or surgical PD catheter
Urgent Start PD

- Femoral Catheter
  - IJ temporary or tunneled catheter
  - Urgent HD

- BUN 120
  - Cr 14

- Hospitalized- low volume, recumbent PD
- Outpatient- low volume, recumbent PD

- Urgent interventional or surgical PD catheter
Urgent Start PD Program

BUN 120
Cr 14

Urgent interventional or surgical PD catheter

Femoral Catheter
IJ temporary or tunneled catheter
Urgent HD

Hospitalized- low volume, recumbent PD
Outpatient- low volume, recumbent PD

Chronic IPD M-W-F for 2 weeks
Then
Train for Home

65
The Influence of Dialysis Treatment Modality on Remaining RRF

The difference persists after adjustment for age, sex, hypertensive status and the use of ACEI.
Benefits of Residual Kidney Function

- Fluid removal
- Sodium removal
- Phosphate removal
- Middle molecule clearance
- Vitamin D production
- Erythropoietin production
- Reduced Left ventricular hypertrophy
- Survival benefit
5 L/wk per 1.73 m² GFR
• 12% decrease in relative risk (RR) of death

250 mL increment in urine volume
• 36% decrease in the RR of death

Probability of Anuria

Adapted from:
ARBS Preserve RRF

Diuretics in Peritoneal Dialysis Patients

61 CAPD patients

Urine volume, mL/24 hours

Time, months

Furosemide 250 mg daily

Control

+48.8 mL

−305 mL

Possible Membrane Preservation
Mesothelial RAS System

Ang II

↑

ACE

Ang I

↑

Renin

Angiotensinogen

Glucose

TGFB1

VEGF
Effect of Valsartan Versus Lisinopril on Peritoneal Sclerosis in Rats

S. Duman, S. Sen, C. Duman, D.G. Oreopoulos
Fig. 1 - Morphology of peritoneum in control (A), hypertonic dextrose alone (B), hypertonic dextrose plus valsartan (C) and hypertonic dextrose plus lisinopril (D) (hematoxylin - eosin, arrow 37 micron).

A. Normal
B. PD Solution
C. Valsartan
D. Lisinopril
The renin-angiotensin-aldosterone system in peritoneal dialysis: is what is good for the kidney also good for the peritoneum?

Sharon J. Nessim¹, Jeffrey Perl² and Joanne M. Bargman³

¹Division of Nephrology, Department of Medicine, Jewish General Hospital, McGill University, Montreal, Quebec, Canada; ²Division of Nephrology, Department of Medicine, St Michael’s Hospital, Toronto, Ontario, Canada and ³Division of Nephrology, Department of Medicine, University Health Network, Toronto General Hospital, Toronto, Ontario, Canada

Morphological changes of the peritoneal membrane that occur over time among patients on peritoneal dialysis include fibrosis and neoangiogenesis. While the pathophysiologic mechanisms underlying these changes are not fully understood, the activation of the renin-angiotensin-aldosterone system (RAAS) may have an important role. Components of the RAAS are constitutively expressed within peritoneal mesothelial cells, and are upregulated in the presence of acute inflammation and chronic exposure to peritoneal dialysate. The high glucose concentration, low pH, and the presence of glucose

The renin-angiotensin-aldosterone system (RAAS) has long been an important focus in nephrology because of its involvement in renal injury across all stages of chronic kidney disease. Its role in peritoneal membrane changes that occur over time in patients on peritoneal dialysis (PD) is an area of increasing interest. In this review, we will discuss the changes that occur in the peritoneal membrane of patients on PD, provide evidence for the presence of a local peritoneal RAAS, and highlight its potential role in the pathogenesis of progressive peritoneal membrane damage. We will also discuss potential therapeutic strategies for the prevention of
INTEGRATED CARE

Simon J. Davies,1 Wim Van Biesen,2 Johan Nicholas,1 Norbert Lameire2

Department of Nephrology,1 North Staffordshire Hospital, Stoke-on-Trent, U.K., and Department of Internal Medicine,2 Renal Division, University Hospital Gent, Gent, Belgium

The use of dialysis and transplantation as complementary therapies in the provision of renal replacement therapy (RRT) is well established. On the other hand, peritoneal dialysis (PD) and hemodialysis (HD) are commonly seen as competitive therapies. But many reasons exist to consider them as being complementary. Those reasons include not just the medical aspects, but also the logistic, financial, and psychosocial aspects of RRT.

The need for RRT has an enormous impact on the life expectancy and psychosocial life of a patient. It also has a substantial cost to society in money and labor. In addition, the increasing number of patients in need of RRT, combined with the potential benefits of an earlier start to RRT, should prod the nephrology community to consider the best way to optimize delivery of RRT in a cost-effective way. In providing RRT, the aim of the integrated care approach is to use the three treatment modalities—transplantation.

THE CASE FOR INTEGRATED CARE

The principle arguments in support of an integrated approach to dialysis provision are these:

- Given the choice, patients will opt for varying treatment modalities to support varying lifestyles.
- PD and HD differ in medical terms regarding what they have to offer, to the point that logical reasons exist for using them in sequence ("PD first").
- Evidence exists that patients who have experienced more than one therapy have a survival advantage.
- Different costs are associated with the different modalities.

THE IMPORTANCE OF PATIENT CHOICE

ESRD Life Plan

Design a SEQUENCE To Maximize Survival

CKD → ESRD: Initial → Continuing Care → Late

Hemodialysis → Peritoneal Dialysis → Home HD → Transplant

“Transition Points”

MD → Nurse Educator → Renal Dietitian → Social Worker

Monthly Visit
Acute Visits
Post Hospitalization
Acute Transition Points

Death/Treatment Withdrawal

HomeTherapies Institute
ESRD Life Plan

Home based
Initial survival advantage
Preserve RRF
Preserve arms

CKD  →  ESRD: Initial  →  Continuing Care  →  Late

MD  Nurse Educator  Renal Dietitian  Social Worker

Peritoneal Dialysis

Monthly Visit
Acute Visits
Post Hospitalization
Acute Transition Points

Death/Treatment Withdrawal

Home Therapies Institute
PD Is Not Just a Viable RRT Option

Home based
Initial survival adv.
Preserve RRF
Preserve arms

CKD

ESRD: Initial

Continuing Care

Late

Home HD
Peritoneal Dialysis

MD
Nurse Educator
Renal Dietitian
Social Worker

Monthly Visit
Acute Visits
Post Hospitalization
Acute Transition Points

Death/Treatment Withdrawal
PD Is Not Just a Viable RRT Option

Home based
Initial survival adv.
Preserve RRF
Preserve arms

CKD → ESRD: Initial → Continuing Care → Late

- Transplant
- Home HD
- Peritoneal Dialysis

MD → Nurse Educator → Renal Dietitian Social Worker

Continuing Care:
- Monthly Visit
- Acute Visits
- Post Hospitalization
- Acute Transition Points

Late:
- Death/Treatment Withdrawal
ESRD Life Plan

Home based
Initial survival adv.
Preserve RRF
Preserve arms

CKD

ESRD: Initial

Continuing Care

Late

Transplant

Home HD

Peritoneal Dialysis

In Center Hemodialysis

Monthly Visit
Acute Visits
Post Hospitalization
Acute Transition Points

Death/Treatment Withdrawal

MD
Nurse Educator
Renal Dietitian
Social Worker

Home Therapies Institute
Conclusion

- The ESRD population continues to rise
- Financial constraints dictate that we consider cost effective therapies
- Patient education on the home option is critical
- Survival studies indicate similar long term survival HD vs PD
- Peritonitis rates have decreased
- Novel surgical approaches have improved long-term catheter function
- PD offers many lifestyle benefits for the appropriate patient population
- “Life Plan” approach for integrated care
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