AREP Home Dialysis Workshop

Home Webinar Series:
Urgent Start Peritoneal Dialysis

2/23/21
Who is the ESRD Network of Texas

Network 14 is a non-profit organization incorporated in Texas and provides services on behalf of the Centers for Medicare & Medicaid Services (CMS) to kidney patients and their providers since 1977.

Our Mission
To support equitable patient- and family-centered quality dialysis and kidney transplant health care through the provision of patient services, education, quality improvement, and information management.
Network’s Home Dialysis Rate

2020 Modalities QIA:
- Jan – October 2020
- Included 156 facilities
- Added 3,277 home patients
Prevalent Patients by ESRD Setting

Only 12% of dialysis patients in 2019 were in a **home modality**.

While 88% of dialysis patients were **in-center**.

![Bar chart showing count of prevalent ESRD patients by treatment/setting in 2019](chart.png)

**Network 14: Count of Prevalent ESRD Patients by Treatment/Setting 2019**

- In-Center Dialysis: 47,905
- Home Dialysis: 6,501
- Total Dialysis Patients: 54,406
- Transplant: 17,560
- Total ESRD Patients: 71,966

Total Dialysis Patients = In-Center Dialysis + Home Dialysis
Total ESRD Patients = Transplant + Total Dialysis
SNF dialysis patients are not shown due to small numbers.
Source of data: CROWNWeb May 2020
Only 11.97% of incident patients in 2019 were initiated in a home modality.

While 85.47% of patients were initiated in-center.
What is the Main Barrier?

<table>
<thead>
<tr>
<th>Home Barriers</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility lack of staff training and time constrains</td>
<td>14</td>
</tr>
<tr>
<td>Facility staff perception about patients not being a good candidate</td>
<td>28</td>
</tr>
<tr>
<td>Facility physician’s bias towards home modality</td>
<td>14</td>
</tr>
<tr>
<td>Patients lack of education or misconceptions</td>
<td>80</td>
</tr>
<tr>
<td>Patients lack of socioeconomic or financial means</td>
<td>83</td>
</tr>
<tr>
<td>Patients lack of eligibility</td>
<td>106</td>
</tr>
<tr>
<td>Patients lack of motivation or family support</td>
<td>189</td>
</tr>
<tr>
<td>Lack of home dialysis program near by</td>
<td>15</td>
</tr>
<tr>
<td>Constraints due to poor or lack of surgical placements</td>
<td>23</td>
</tr>
<tr>
<td>Lack of communication between home dialysis clinic and facility</td>
<td>12</td>
</tr>
</tbody>
</table>
Home Change Package

- NCC’s Universal Staff Education
- Network’s Home Dialysis Coalition
- Home Hero Interactive Events
Contact Us:
Maryam Alabood 469-916-3803
Visit: www.esrdnetwork.org
WELCOME
Home Dialysis Workshop Webinar Series
Urgent Start PD

Tuesday, February 23, 2021
<table>
<thead>
<tr>
<th>Title</th>
<th>Status</th>
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</thead>
<tbody>
<tr>
<td>Home Therapies: Current State and Future Potential</td>
<td>Completed</td>
</tr>
<tr>
<td>Working With The PD Prescription</td>
<td>Completed</td>
</tr>
<tr>
<td>Good Nutritional Practices for Hemodialysis Patients</td>
<td>Completed</td>
</tr>
<tr>
<td>Pharmacological Intervention and Outcomes in Hyperphosphatemia and Mineral Bone Disorder</td>
<td>Completed</td>
</tr>
<tr>
<td>Fluids, Electrolytes, Acids and Bases</td>
<td>Completed</td>
</tr>
</tbody>
</table>
Dr. Anjali Saxena

Director of Peritoneal Dialysis,
Santa Clara Valley Medical Center, San Jose, CA
Clinical Associate Professor of Medicine,
Stanford University, Stanford, CA
Urgent Start
Peritoneal Dialysis
Course Disclosure

- This educational program has been developed by the Medical Information and Communication Office of the Fresenius Medical Care Renal Therapies Group.

- It is intended to provide pertinent data to assist health care professionals in forming their own conclusions and making decisions.

- It is not intended to replace the judgment or experience of the attending physician or other medical professional.

- The treatment prescription is the sole responsibility of the attending physician.

- The presenter is AREP faculty under contract with the Fresenius Medical Care Renal Therapies Group.
Course Objectives

✓ Describe history of dialysis initiation and define urgent start PD
✓ Understand the outcomes, potential benefits, and risks associated with urgent start PD
✓ Review logistic and prescriptions considerations of urgent start PD
✓ Examine the use of PD for acute kidney injury
* Training if home modality is chosen
Unplanned Dialysis Initiation

40 – 60% of patients have a “suboptimal” dialysis start

Suboptimal initiation:
- In-hospital dialysis initiation
- Initiation with a CVC
- Not initiating with chosen modality
Pre-ESRD Care Does Not Prevent Suboptimal Initiation

### Study 1: Nephrology Care

**>12 months**

56% Suboptimal Initiation\(^1\)

- Patient-related delays
- Acute-onset CKD
- Surgical delays
- Late decision making by nephrologist

### Study 2: Nephrology Care

**> 4 months**

45% Suboptimal Initiation\(^2\)

- Lack of referral or time waiting for access creation
- Rapid decline of RRF
- Missed or cancelled appointments

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Another Option for Dialysis Initiation

Peritoneal dialysis is possible in both planned or unplanned, and urgent or non-urgent start situations.
**Urgent Start vs. Early Start vs. Acute**

**Urgent Start PD**
- Option for patients with advanced CKD who urgently and unexpectedly need dialysis are treated with PD
- Catheters are used within 48-72 hours of placement

**Early Start PD**
- More elective variant
- PD is initiated 3-14 days after catheter insertion

**Acute PD**
- Renal replacement therapy for patients with AKI
- Generally, temporary until renal function resumes

Polling Question

Which of the following have you experienced in your practice?

(select all that apply)

A. Planned Start PD
B. Urgent Start PD
C. Early Start PD
D. Acute PD
Outcomes, Potential Benefits, and Risks with Urgent Start PD
Patients who initiate dialysis with urgent start PD* tend to stay on PD in the first year.

*Mean time between catheter insertion and PD initiation was 3.5 ± 2.3 days, range 0 - 8 days, n=35.

Wojtaszek E, et al. Front Physiol. 2019;10(JAN)
Complication Rates with Urgent Start PD

Except for catheter leaks, urgent start* and elective start PD have similar rates of catheter complications

* In the urgent start group, dialysis was started within 48 hrs of catheter placement.

**Catheter Complications in Urgent Start and Elective Start PD**

<table>
<thead>
<tr>
<th>Complication</th>
<th>Elective (%)</th>
<th>Urgent (%)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exit site infection</td>
<td>5.2</td>
<td>3.5</td>
<td>0.683</td>
</tr>
<tr>
<td>Peritonitis</td>
<td>15.1</td>
<td>27.6</td>
<td>0.092</td>
</tr>
<tr>
<td>Catheter malfunction</td>
<td>28.4</td>
<td>17.2</td>
<td>0.203</td>
</tr>
<tr>
<td>Catheter leak</td>
<td>3.3</td>
<td>13.8</td>
<td>0.011</td>
</tr>
<tr>
<td>Primary leak</td>
<td>1</td>
<td>3.5</td>
<td>0.256</td>
</tr>
<tr>
<td>Hernia</td>
<td>4.3</td>
<td>10.3</td>
<td>0.159</td>
</tr>
<tr>
<td>Hematoma or bleeding</td>
<td>2.8</td>
<td>0</td>
<td>0.358</td>
</tr>
<tr>
<td>Bowel perforation</td>
<td>0.5</td>
<td>0</td>
<td>0.710</td>
</tr>
</tbody>
</table>

[Graph showing the proportion of catheters remaining complication-free over time with Logrank p = 0.4152]
Urgent Start PD vs Hemodialysis

Survival and outcomes are comparable for urgent start PD and urgent start HD

### Outcomes with Urgent Start PD and Urgent Start HD

<table>
<thead>
<tr>
<th>Outcome</th>
<th>PD (%)</th>
<th>HD (%)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection</td>
<td>35.4</td>
<td>44.0</td>
<td>0.10</td>
</tr>
<tr>
<td>Mechanical complication</td>
<td>24.7</td>
<td>37.4</td>
<td>0.06</td>
</tr>
<tr>
<td>Readmission within 30 days of discharge</td>
<td>35.4</td>
<td>44.0</td>
<td>0.10</td>
</tr>
<tr>
<td>Death</td>
<td>19.9</td>
<td>29.6</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Risks with Urgent Start PD

Urgent start PD is associated with an increased risk for catheter complications, mostly catheter migration and leaks, compared to planned start PD.

Complications Within 4 Weeks of PD Commencement

- **Leak**: 12% in Urgent Start vs. 3% in Planned Start
- **Catheter blockage**: 4% in Urgent Start vs. 0% in Planned Start
- **Catheter migration**: 12% in Urgent Start vs. 1% in Planned Start
- **Exit-site infection**: 15% in Urgent Start vs. 6% in Planned Start
- **Peritonitis**: 0% in Urgent Start vs. 9% in Planned Start

Risk of leaks can be mitigated with low volume, supine, intermittent exchanges.

*Median time between catheter insertion and PD initiation was 4 days, range 1 - 7 days.

Why Utilize Urgent Start PD?

- Avoid the need for two access types in patients who wish to eventually do PD
- Avoids use of CVC and unnecessary HD exposure
- Can be a safe and effective option for renal replacement therapy
- Increases PD utilization
- Possible preservation of residual renal function

Logistic Considerations for Urgent Start PD
Logistic Considerations for Urgent Start PD

Infrastructure and protocols to support:

- Identifying appropriate candidates
- Patient education
- PD catheter placement
- Trained nursing staff & Available equipment
- PD Prescription
Identifying Candidates

- Patients who require urgent, but not emergent dialysis
- Could wait 24 – 48 hours before initiating

- Patients requiring emergent dialysis should initiate with hemodialysis.
- Particularly patients required immediate treatment for:
  - Critical illness
  - Volume overloaded
  - Hyperkalemia
  - Acidotic
  - Overdose
Polling Question

Which of the following patients is a potential candidate for urgent start PD? (select one option)

A. New patient
   - Shortness of breath
   - Hb 12.5, Cr 13.6, K 7.2

B. Known CKD patient
   - No SOB, normotensive
   - Hb 11, Cr 6, GFR 10, K 4

C. New patient, increasing fatigue over last 4 weeks
   - Ankle edema
   - Hb 10.9, Cr 8.4, K 5.8

D. New patient
   - Liver cirrhosis, history of social instability
   - Active drug abuse confirmed
   - Hb 9, Cr 7.2, K 4, Alb 2.4

SOB: shortness of breath
### Identifying Candidates

Survey to quickly evaluate possible candidates:

<table>
<thead>
<tr>
<th>Work/Home</th>
<th>Medical/Surgical</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Do you plan to work while on dialysis?</td>
<td></td>
</tr>
<tr>
<td>• Do you have a place you consider home?</td>
<td></td>
</tr>
<tr>
<td>• Do you have an accessible restroom for handwashing and effluent disposal?</td>
<td></td>
</tr>
<tr>
<td>• Do you have storage space?</td>
<td></td>
</tr>
<tr>
<td>• Can your home be kept clean?</td>
<td></td>
</tr>
<tr>
<td>• Do you have caregiver responsibilities?</td>
<td></td>
</tr>
<tr>
<td>• What medical problems do you have?</td>
<td></td>
</tr>
<tr>
<td>• Do you suffer from any psychiatric disorders or memory problems?</td>
<td></td>
</tr>
<tr>
<td>• What abdominal surgeries have you had?</td>
<td></td>
</tr>
<tr>
<td>• Can you walk without the help of others?</td>
<td></td>
</tr>
<tr>
<td>• Can you lift 10-20 lb bag of fluid?</td>
<td></td>
</tr>
<tr>
<td>• Do you have any vision or hearing problems?</td>
<td></td>
</tr>
</tbody>
</table>
Patient Education

- Many urgent start patients have little to no knowledge of dialysis or therapy options
- In-hospital education should allow patients make an informed decision about their therapy choice

- Provide support and empathy
- Patient centered
- Basic knowledge of kidney function
- Therapy options available
- Discuss benefits, risks, and challenges
- Use of visual and written teaching aids

Identifying Candidates

Patient Education

PD Catheter Placement

Staff and Equipment

PD Prescription

Urgent Education Influences Modality Choice

- In-hospital education programs for urgent starters are feasible and effective
- Following an in-hospital education program, most patients pursued a home dialysis option

Polling Question

How are your PD catheters placed today?
(choose all that apply)

A. Open surgical insertion
B. Percutaneous needle-guidewire
C. Basic laparoscopy
D. Laparoscopy with adjunctive procedures
Urgent Start PD Catheter Placement

A major limiting factors in urgent start PD is the availability of willing surgeons, nephrologists, or interventional radiologists to place PD catheters competently on short notice\(^1\)

### Catheter Outcomes in Urgent Start PD\(^2\)

<table>
<thead>
<tr>
<th></th>
<th>Surgical</th>
<th>Laparoscopic</th>
<th>Percutaneous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Patients</td>
<td>374</td>
<td>33</td>
<td>103</td>
</tr>
<tr>
<td>Catheter Leaks</td>
<td>9 (2.5%)</td>
<td>3 (9%)</td>
<td>8 (8%)</td>
</tr>
<tr>
<td>Catheter Migration</td>
<td>18 (5%)</td>
<td>2 (6%)</td>
<td>9 (9%)</td>
</tr>
<tr>
<td>Catheter Revision</td>
<td>11 (2%)</td>
<td>2 (6%)</td>
<td>9 (9%)</td>
</tr>
</tbody>
</table>

- Studies are limited, but placement technique in urgent start PD does not appear to influence catheter mechanical outcomes
- In planned start PD, laparoscopic placement with adjunctive procedures has been shown to have better catheter function outcomes compared to surgical and percutaneous placement methods\(^3\)

Staffing Requirements

Program coordinators are typically used to run urgent start programs and coordinate between nephrologist, surgeon, social workers, and outpatient clinic staff.

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**Hospital**

- Social worker or nurse to provide counseling and education to the patient and family
- Nurses with PD experience who have been trained specifically on urgent start PD, PD equipment, and post-operative catheter care
- Nephrologists with know-how to prescribe urgent start PD

**Clinic**

- PD nurses with availability to administer outpatient, intermittent PD to an untrained patient in the clinic or patient’s home
- Nurses with flexibility to train patients who come in urgently

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Manual exchanges (CAPD) or PD cyclers (APD) can be used for urgent start PD

- Hospitals should have a ready supply of equipment and disposables:
  - PD Catheters
  - Catheter extension sets compatible with stocked supplies/equipment
  - Dialysate options
  - Cyclers
  - Ancillaries (caps, drain bags, adapters, etc)
### Urgent Start PD Prescription Considerations

**Identifying Candidates**
- Evaluate patient for uremic symptoms to determine if dialysis is needed urgently or if early start PD is more appropriate (wait 3-14 days).

**Patient Education**
- If patient is not overtly uremic, delaying initiation or doing intermittent PD 3–5 days/week may be considered.

**PD Catheter Placement**
- Initial PD prescription administered by hospital or clinic nurses until patient is trained.

**Staff and Equipment**
- Prescription modeling can assist in determining an adequate prescription for urgent start.

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Ghaffari A. UpToDate; 2019:Topic 95328, Version 11.0.
Urgent Start PD Prescription

There are currently no consensus guidelines or best practice recommendations regarding urgent start PD prescriptions.

- Balance benefits of initiating urgent start PD with risk of early catheter leaks
- Adjust prescription to reduce risk of pericatheter leaks and other complications related to early use of the catheter
- Lower volume and supine positioning keep intraperitoneal pressure low
- Dry periods allows the incision site to heal

General suggestions from the literature:

✓ Lower volume
✓ Supine positioning
✓ Dry periods
# Urgent Start PD Prescription

## Example 1: Based on BSA and GFR

### Identifying Candidates

### Patient Education

### PD Catheter Placement

### Staff and Equipment

### PD Prescription

<table>
<thead>
<tr>
<th>GFR &gt;7 mL/min</th>
<th>BSA ≤1.7 m²</th>
<th>BSA &gt; 1.7 m²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>750 mL</td>
<td>1000 mL</td>
</tr>
<tr>
<td></td>
<td>4 cycles 5:00 hrs/day</td>
<td>5 cycles 6:40 hrs/day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GFR ≤ 7 mL/min</th>
<th>BSA ≤1.7 m²</th>
<th>BSA &gt; 1.7 m²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1000 mL</td>
<td>1250 mL</td>
</tr>
<tr>
<td></td>
<td>6 cycles 8:00 hrs/day</td>
<td>6 cycles 8:00 hrs/day</td>
</tr>
</tbody>
</table>

### Other considerations:

- **Solutions:**
  - 1.5%: no peripheral edema or SOB
  - 2.5%: presence of edema or SOB
  - 4.25%: for severe volume overload in conjunction with oral diuretic

- **Logistics**
  - All supine exchanges
  - Patient uses restroom before being connected
  - Fluid is completely drained if patient needs to sit or walk
  - Cough suppressants as necessary
  - Avoid eating unless draining
**CAPD Urgent Start Regimen**

<table>
<thead>
<tr>
<th>Day</th>
<th>Fill Volume</th>
<th>Dwell Time</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>500mL (1.5% glucose + 1000 U/L heparin)</td>
<td>3 hours</td>
<td>Supine</td>
</tr>
<tr>
<td>4-6</td>
<td>1000mL</td>
<td>4 hours</td>
<td>Ambulatory</td>
</tr>
<tr>
<td>7+</td>
<td>2000mL</td>
<td>4 exchanges/day</td>
<td></td>
</tr>
</tbody>
</table>

- **Identifying Candidates**
- **Patient Education**
- **PD Catheter Placement**
- **Staff and Equipment**
- **PD Prescription**
Polling Question

How would you initiate PD in this patient?
(select one option)

- 58-year old female
- Presenting with nausea and worsening hypertension
- Peripheral edema, and mild SOB
- Hb 11, Cr 8.4, K 5.6

A. Urgent start PD: Immediate initiation of PD after catheter insertion, 1 L fills, 1-hour dwells, supine, for 24 hours/day

B. Urgent start PD: Initiate PD 24h after catheter insertion with 1 L fills, 2-hour dwells, supine, for 10 hours/day

C. Early start PD: Initiate PD 7 days after catheter insertion with 1 L fills, 2-hour dwells, supine, for 8 hours/day
PD for Acute Kidney Injury
Guidelines for Acute PD

- Published by the International Society of Peritoneal Dialysis (ISPD)

- Includes:
  - Potential advantages and possible challenges
  - Catheter insertion options
  - Solution types for various situations
  - Prescription considerations

- Available from the ISPD website:
  - https://ispd.org/ispd-guidelines/
PD for Acute Kidney Injury

PD should be considered as a suitable method of continuous renal replacement therapy in patients with acute kidney injury

Benefits

- Technically simple
- Minimal infrastructure requirements
- Anticoagulation not necessary
- Gradual solute removal
- Potential for cytokine removal based on peritoneal physiology*  

Challenges

- Risk of peritonitis
- Unpredictable fluid removal rates
- Possibly inadequate solute clearance
- Glucose absorption and protein loss
- Impaired diaphragmatic movement
- Not appropriate for ventilated or proned patients

* No studies have definitively demonstrated this occurs

Outcomes with PD for AKI

Meta-analysis suggests no difference in mortality between PD and extracorporeal RRT

Well-designed studies are limited
Targeting a weekly Kt/V urea of 3.5 provides outcomes comparable to that of daily HD; for many patients with AKI targeting a weekly Kt/V of 2.1 may be acceptable.

During initial 24 hrs of therapy, cycle times should be dictated by clinical circumstances. Initial correction of hyperkalemia, fluid overload, and/or metabolic acidosis requires shorter dwells.

Avoid fluid overload and hypovolemia by adjusting dextrose concentrations.

Monitor levels of medications as clearance may be enhanced.

Acute PD with Standard Dialysate using an APD Cycler

- Continuous therapy
- 2 L fill volumes
- Dwell time:
  - Initially: 1-3 hrs
  - After acidosis, pulmonary edema, and/or hyperkalemia resolved: 4-6 hrs
- 500 U/L IP Heparin
Clinical Takeaways

- Urgent start PD is a safe and effective renal replacement therapy that can achieve similar outcomes to planned start PD and urgent start HD
- Infrastructure and clinical protocols are necessary for successful urgent start programs
- Ensuring low volume, supine exchanges mitigates risk of catheter leaks
- PD can be used to treat AKI in some cases
Audience Q&A
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