

**Urgent-Start Peritoneal Dialysis: A Multicenter Study**

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**Introduction**

- Peritoneal dialysis (PD) is an attractive but underutilized option for renal replacement therapy among end-stage renal disease patients in the United States. A major barrier is the perceived need for advanced planning before patients can start PD, which precludes offering PD as an initial modality to unplanned patients, who account for up to 65% of all new dialysis starts.

- Several single-center studies have demonstrated the safety and feasibility of "urgent-start PD"—which includes PD catheter placement, rapid production of the modality, and concurrent patient training in unplanned patients.1 4

- An Urgent-Start PD pilot undertaken at a large dialysis organization (LDO) demonstrated the safety and feasibility of urgent-start PD, which includes PD catheter placement, rapid initiation of the modality, and concurrent patient training in unplanned patients.1 4

**Objectives**

- **Objective 1**—To compare rates of mortality, hospitalization, and infection between Urgent-Start PD patients and matched controls who initiated in-center hemodialysis (HD) via a central venous catheter (CVC).

- **Objective 2**—To compare rates of mortality, hospitalization, infection, peritonitis, bloodstream infection, and morbidity failure between Urgent-Start PD patients and matched controls who initiated traditional planned PD.

**Methods**

**Staff Education**

- Specific study protocols, guidelines, and processes to standardize the urgent-start process across different clinics were created and PD was trained in their use. These included:

  - Protocol to determine appropriate timing of dialysis initiation after PD catheter placement
  - Standardized initial urgent-start PD prescription (small volume, in-center, supine PD with volumes, and timing of treatment and renal function)
  - Standardized process for patient PD training, delivery of in-center urgent-start PD, and transition to home PD after the urgent-start period
  - Guidelines for management of early complications

**Populations**

- Eligible patients were those who initiated dialysis at the LDO between April 2012 and March 2014: Urgent-Start PD patients: Enrolled in Urgent-Start PD program patient enrollment records.

  - In-center HD controls: Began in-center HD via CVC at the LDO within 7 days of first-ever dialysis.

  - Traditional PD controls: Began PD at the LDO as an incident modality but were not part of the Urgent-Start PD program.

**Properity Matching**

- Urgent-Start PD patients were propensity score matched 1:1 separately with HD controls and with PD controls, using variables age, sex, race, diabetes, chronic lung disease, hypertension, heart failure, coronary artery disease, cerebrovascular disease, peripheral vascular disease, and Charlson Comorbidity Index score.

**Results**

- **Results**

  - **Table 2. Comparative Incidence Rate Ratios Between Urgent-Start PD Patients and Matched Controls**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Urgent-Start PD</th>
<th>Matched Controls</th>
<th>Matched tradition controls</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Infection</td>
<td>0.49 (0.29, 0.84)</td>
<td>0.96 (0.52, 1.79)</td>
<td>1.44 (0.88, 2.36)</td>
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<td>Mortality</td>
<td>1.45 (1.13, 1.87)</td>
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<td>Hospitalizations</td>
<td>145.95</td>
<td>8.04</td>
<td>381</td>
<td>54</td>
<td>21</td>
</tr>
</tbody>
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**Discussion**

- **Compared to HD controls, Urgent-Start PD patients had:**

  - 51% lower mortalities (p < 0.001)
  - 39% lower hospitalizations (p < 0.001)
  - 51% lower mortality (p = 0.009)
  - 45% higher hospitalizations (p = 0.004)

- **Compared to traditional PD controls, Urgent-Start PD patients had:**

  - Equivalent mortality (p = 0.91) (p = 0.91)
  - 40% higher hospitalizations (p = 0.354)
  - No significant differences were found. (p > 0.15)

- In both groups bloodstream infection rates were extremely low.

- Urgent-Start PD patients were more likely than HD controls to have morbidity failure:

  - This effect was greater among low-volume Urgent-Start PD centers than high-volume Urgent-Start PD centers

- The reason for the morbidity failure are currently being investigated.

**Table 1. Patient Characteristics Among Propensity Score Matched Urgent-Start PD Patients and Matched Controls**

<table>
<thead>
<tr>
<th>Race</th>
<th>Urgent-Start PD</th>
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<tr>
<td>Black</td>
<td>369 (98.1)</td>
<td>369 (98.1)</td>
<td>369 (98.1)</td>
</tr>
<tr>
<td>Other/unknown</td>
<td>7 (1.9)</td>
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**Table 3. Comparative Incidence Rate Ratios Between Urgent-Start PD Patients and Matched Controls**

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**Conclusions**

- Urgent-Start PD, as part of a structured program, provides superior short-term survival, fewer hospitalizations, and lower infection rates compared to HD with central venous catheter.

- Urgent-Start PD provides similar short-term survival and infections and hospitalization rates compared to traditional planned PD, despite a higher rate of technique failures.

- Urgent-Start PD could be more broadly implemented, allowing more unplanned end-stage renal disease patients the option of starting PD while optimizing outcomes.