Urgent-start peritoneal dialysis (PD) can be defined as initiation of PD within 2 weeks of catheter insertion. Urgent-start PD can be offered to patients who are referred late to a nephrologist and who would typically be initiated on hemodialysis with a temporary vascular access. An urgent-start PD capability requires expedited options education, catheter placement, unique change in the PD unit infrastructure, and new processes of care.

This report describes the urgent-start PD program established by a nephrology private practice in the United States. Operational aspects of the program and initial clinical results are described.

Key words
Urgent start, automated peritoneal dialysis, recumbent, supine, low-volume

Introduction
Initiating peritoneal dialysis (PD) urgently in the late-referred patient with end-stage renal disease is a viable option and avoids the use of central venous hemodialysis (HD) catheters, which expose the patient to the risks of bacteremia, sepsis, and repeated procedures before permanent access can be achieved. In 2011, the U.S. Renal Data System reported that 82% of U.S. patients initiating HD with no prior nephrology care initiated dialysis with a central venous catheter (1).

Late-referred end-stage renal disease patients are typically not considered for urgent initiation of PD because of the difficulties involved in obtaining urgent surgical catheter placement, a belief that the catheter cannot be used for 2 – 4 weeks after surgical placement, and less familiarity among caregivers about the initiation of an urgent-start PD prescription.

From: 1DaVita East, Fort Lauderdale, Florida, and 2Baxter Healthcare Corporation, Deerfield, Illinois, U.S.A.
To initiate PD urgently, patients are dialyzed initially in the recumbent position with lower volumes of dialysate. The administrators agreed to the purchase of two chairs that could be lowered into a more supine position (Champion 54: Champion Manufacturing, Elkhart, IN, U.S.A.). In the existing PD unit, a wall was removed to expand the space, allowing the reclining chairs to be stationed and an automated cycler to be positioned next to each chair. The chairs were placed so that the PD nurse could see the patients, but could continue to work with other patients in the unit as part of the routine daily schedule.

Recognizing that an urgent-start PD capability would represent a new nursing responsibility, an additional nurse was hired so that the PD program could accommodate the expected growth in census. This concept of “staff to grow” was felt to be preferable to “grow, then staff” to prevent undue stress on the existing nursing staff.

A new approach to dialysis options education was created. Once reversibility of any kidney function was excluded, patients were educated in dialysis options by the nephrologist and explained the need for urgent catheter placement—either a permanent PD catheter or a temporary vascular access catheter that would be followed by additional procedures to establish a permanent vascular access. The lifestyle implications of home-based compared with in-center therapies were reviewed with the patients and the available family members. The patients, with the nephrologist, then decided on their dialysis modality.

Urgent-start PD prescription
Whenever possible, the urgent-start PD was initiated in the outpatient setting using a 6-hour treatment schedule. The treatments were delivered intermittently—typically Monday, Wednesday, and Friday for the first 2 weeks (2). During those initial 2 weeks, patients reviewed several videos relevant to chronic kidney disease education and were given lesson plans to complete at home and return at the subsequent session. After the initial 2 weeks, patients were formally trained to perform self-care. To begin home therapy, most patients were trained initially to continuous ambulatory PD ($n = 10$); 1 patient was trained directly to automated PD.

The initial dwell volume was 1 L in all patients. As mentioned, the patients were kept in the recumbent position with fluid in the abdomen. If the patient needed to sit or stand, they were drained completely before changing position. The HomeChoice cycler (Baxter Healthcare Corporation, Deerfield, IL, U.S.A.) was programmed for 6-hour sessions with 1-L exchanges, which resulted in 47-minute dwell times in 6 exchanges. This program was termed the “modified prescription plan” to differentiate it from other programs. The dextrose concentrations were determined based on the ultrafiltration requirements for the session. Patients felt to be more uremic or to have more significant ultrafiltration requirements were initiated on urgent-start PD in the hospital setting with prolonged treatments and were then transitioned to the outpatient unit. Otherwise, hospitalized patients were discharged within 24 hours of catheter placement and urgent-start PD was initiated in the outpatient setting.

Clinical results
From January 2011 to December 2011, 11 patients entered into the urgent-start PD clinical pathway. Table I details the clinical characteristics of those patients. All patients received laparoscopic surgical catheter placement. The surgeon placed a purse-string suture at the rectus fascia to secure the deep cuff in 2 patients; the remaining 9 patients did not have rectus sutures. Dialysis was initiated within 24 hours in 9 patients and within 2 days of surgery in 2 patients. As mentioned, the patients were placed in the recumbent position with 1-L fill volumes. Treatment began in the hospital (first two treatments), for 2 patients; outpatient treatments then followed. The other 9 patients started as outpatients. In 2 patients with larger ultrafiltration requirements, we prescribed a combination of 2.5% dextrose and 4.25% dextrose to achieve daily ultrafiltration of 2 – 2.5 L. In those patients, the ultrafiltration occurred over 6 hours, and the dwell volume did not exceed 1.42 L.

No leaks and no episodes of peritonitis occurred during the urgent-start initiation. One patient experienced initial catheter dysfunction and required catheter revision. The revised catheter functioned properly, and the patient was subsequently discharged on PD. All 11 patients completed 2 weeks of urgent-start PD, completed training, and transitioned to home therapy. One patient subsequently received a renal graft, and one patient failed PD in the 5th month because of psychosocial factors. No peritonitis occurred during the reporting period of 30 days after PD initiation.
Discussion

Ideally, patients requiring renal replacement therapy are educated about their dialysis and transplant options, undergo elective outpatient surgery to prepare for dialysis access, and initiate dialysis electively. Unfortunately, that situation is not common in the United States.

According to the U.S. Renal Data System, 82% of dialysis patients initiate dialysis with a temporary central venous catheter (1). Current efforts to propagate a “fistula first” policy have not had a significant impact on the rate of catheter use to initiate dialysis.

Patients requiring dialysis but presenting late to a nephrologist are rarely offered PD. The PD modality is usually not considered for the late-referred patient because of inability to obtain a surgical catheter insertion, a belief that the catheter must heal for 2 – 4 weeks before PD initiation, and infrastructure issues that prevent the urgent training of patients so that they can begin therapy at home. Yet urgent-start PD would allow many late-referred patients to take advantage of a dialysis modality that can provide for independence, travel, and other lifestyle benefits, and also for the initiation of dialysis on a modality associated with better preservation of residual kidney function. Initiating dialysis with a PD catheter would allow for a single surgical procedure that creates not only an urgent access, but then matures into a chronic access—that is, a single procedure instead of the repeated vascular access procedures needed for HD (3).

The urgent-start PD program that we described (summarized in Table II) was initiated in a private nephrology practice to be able to give the late-referred patient the option of starting dialysis with PD. The program has allowed for the successful initiation of PD in these late-referred patients. Similar experiences have recently been published. Ghaffari described an urgent-start PD program initiated at the University of Southern California, Los Angeles County Hospital (4). He reported on clinical outcomes in 18 patients initiating PD urgently. In his experience, the patients received urgent PD catheter placement by an interventional radiologist in the interventional radiology suite. The patients were then initiated on recumbent, low-volume PD on an intermittent schedule for 2 weeks. After 2 weeks, the patients were trained on home therapy. In his report, patients treated in this urgent-start program had a lower peritonitis risk, increased reports of leaks that were managed conservatively, and clinical outcomes at 90 days that were similar to those in standard-start patients. No leaks occurred in our case-series, and we were strict to maintain the recumbent position. We used surgical catheter placement rather than the interventional radiology approach, which may have affected leak occurrence.

In other reports in the literature, Povlsen and Iversen described 52 patients that initiated PD urgently within 24 hours of surgical catheter placement (5). Their patients received 12-hour low-volume exchanges overnight using automated PD. The authors

### Table I: Clinical characteristics of 11 patients entering the urgent-start peritoneal dialysis pathway

<table>
<thead>
<tr>
<th>Sex</th>
<th>Comorbidities</th>
<th>Age</th>
<th>Weight (kg)</th>
<th>Start date</th>
<th>Catheter placement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>DM, HTN, gout</td>
<td>52</td>
<td>113</td>
<td>February 24, 2011</td>
<td>Laparoscopic</td>
</tr>
<tr>
<td>Male</td>
<td>HIV, HTN</td>
<td>35</td>
<td>78</td>
<td>February 28, 2011</td>
<td>Laparoscopic</td>
</tr>
<tr>
<td>Male</td>
<td>HTN</td>
<td>38</td>
<td>108</td>
<td>April 29, 2011</td>
<td>Laparoscopic</td>
</tr>
<tr>
<td>Female</td>
<td>HTN</td>
<td>57</td>
<td>73</td>
<td>May 27, 2011</td>
<td>Laparoscopic</td>
</tr>
<tr>
<td>Male</td>
<td>IgA nephropathy</td>
<td>46</td>
<td>58</td>
<td>July 18, 2011</td>
<td>Laparoscopic</td>
</tr>
<tr>
<td>Female</td>
<td>HTN, DM</td>
<td>56</td>
<td>40</td>
<td>July 29, 2011</td>
<td>Laparoscopic</td>
</tr>
<tr>
<td>Male</td>
<td>HTN, DM</td>
<td>52</td>
<td>86</td>
<td>August 18, 2011</td>
<td>Laparoscopic</td>
</tr>
<tr>
<td>Female</td>
<td>HIV, HTN</td>
<td>40</td>
<td>68</td>
<td>September 30, 2011</td>
<td>Laparoscopic</td>
</tr>
<tr>
<td>Female</td>
<td>Sickle cell anemia</td>
<td>38</td>
<td>48</td>
<td>October 3, 2011</td>
<td>Laparoscopic</td>
</tr>
<tr>
<td>Male</td>
<td>DM, CHF</td>
<td>66</td>
<td>114</td>
<td>November 2, 2011</td>
<td>Laparoscopic</td>
</tr>
<tr>
<td>Male</td>
<td>DM, HTN</td>
<td>63</td>
<td>61</td>
<td>November 28, 2011</td>
<td>Laparoscopic</td>
</tr>
</tbody>
</table>

DM = diabetes mellitus; HTN = hypertension; IgA = immunoglobulin A; CHF = congestive heart failure.
matched these urgent-start PD patients with elective-start patients for 3-month outcomes comparisons. Urgent-start patients more often developed catheter complications requiring revision, but PD technique success at 3 months did not differ between the groups. Lobbedez and colleagues described 34 “unplanned dialysis” patients who required temporary vascular access placement, but who then quickly transitioned to PD instead of tunneled HD catheters (6). The patients underwent recumbent low-volume intermittent PD using a pre-programmed automated PD prescription. The authors concluded that PD proved to be an alternative to urgent HD, avoiding the need for tunneled vascular catheters. Additional small case series of urgent-start PD experiences in the United States were presented in poster presentations at the 2012 Annual Dialysis Conference in San Antonio, Texas.

**Conclusions**

Urgent-start PD is an acceptable alternative for the late-referred dialysis patient. It avoids the need for temporary vascular access and repeated vascular procedures to establish a permanent access. Urgent-start PD allows for the better preservation of residual kidney function and for the lifestyle benefits that can be achieved with a home-based therapy. Urgent-start PD regimens are based on timely catheter placement followed by lower dwell volumes instilled while the patient is in the recumbent position. Staff-assisted intermittent regimens allow for acceptable clearance and catheter maturation before training and transition to the home setting. Developing an urgent-start PD capability should be a priority in PD programs dedicated to offering the full range of treatment options for the late-referred patient deemed appropriate for PD therapy.

**Disclosures**

CG and SG are employees of Baxter Healthcare Corporation.

**References**


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