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## Peritoneal Dialysis and the Interventional Nephrologist

By Anil Agarwal

The incidence of ESRD is increasing, with a current prevalence of over half a million patients in the United States. Most ESRD patients are treated with hemodialysis (HD) and the number of patients receiving peritoneal dialysis (PD) has steadily declined over the past several decades. According to the U.S. Renal Data System 2011 annual report, approximately 7 percent of patients were being treated with PD at the end of 2009, reflecting gross underuse of this form of therapy (1). Of the incident patients, dialysis was initiated using PD in only 6.1 percent.

The growth in the number of interventional nephrologists during the past decade has established a new paradigm of approach to vascular access and to PD catheter placement. The safety of these procedures and the growth of the PD patient population in the interventional nephrology programs that perform PD catheter placement have been well documented. Interventional nephrologists are uniquely poised to improve the use of PD by highlighting and capitalizing on the following attributes.

### Biological benefits of PD

PD offers several advantages over HD including better autonomy, improved patient satisfaction, superior volume control, and better initial survival. The mortality and morbidity in incident HD patients is much higher than in incident PD patients. Inasmuch as HD is started with a catheter in nearly 80 percent of patients, almost all of this early mortality has been attributed to catheters (2). Improving processes to achieve nephrology care early to avoid catheter use will be needed to decrease this early disparity in the future. Meanwhile, the ready placement of PD catheters by interventional nephrologists to initiate dialysis using PD or as a bridge access will remain an easy approach to curtail high incident mortality.

### Financial benefits

The recent enactment of a prospective payment system (popularly known as the “bundle”) offers even greater incentive to providers if PD is used instead of HD. Furthermore, PD catheter placement is now reimbursed at a much more favorable rate,

especially if imaging is used. Given that interventional nephrologists use a peritoneoscopic or fluoroscopic approach, the financial gain should provide impetus to improve PD use.

### Counteracting challenges to offering PD

Late referral, poor modality education or offering to patients, lack of new physician training in PD, and delay in PD catheter placement often result in missed opportunities. By offering PD and expeditiously placing the PD catheter without delays in scheduling, interventional nephrologists have the ability to increase PD use. Indeed, PD catheter placement by interventional nephrologists has been reported to improve PD use. Gadallah et al. reported a significant increase in the fraction of incident patients choosing PD from 19 percent to 76 percent with placement of the PD catheter by interventional nephrologists, almost tripling the prevalent PD population (3). The results were confirmed by a multicenter study that showed not only an increase in the PD population at centers providing PD catheter placement by interventional nephrologists but also a decline in the PD population when interventional nephrologists discontinued placing PD catheters (4). Perhaps the fact that the PD population increased is also a testament to the dedication of the providers of this modality.

### Improving awareness and training

PD catheter placement by interventional nephrologists is also likely to result in increased awareness and interest by the provider and in better education of trainees. Because the nephrologist is likely to provide significant continuity of care to the patient, better outcomes are likely.

### Technical aspects

Interventional nephrologists can place PD catheters with ease using peritoneoscopy or fluoroscopy. As opposed to open surgical dissection or laparoscopic placement, peritoneoscopic placement uses a much smaller scope (2.2 mm in diameter), a small puncture size, one peritoneal puncture site, local rather than general anesthesia, and freedom from scheduling delays, making out-

patient same-day placement a possibility. As mentioned earlier, the reimbursement policy for PD catheter placement is now more favorable.

### Safety of PD catheter placement by interventional nephrologists

Published data on PD catheter placement by interventional nephrologists does not indicate a higher incidence of complications than with those placed by surgeons. A randomized trial compared the peritoneoscopic and surgical techniques and found that early peritonitis episodes (occurring within 2 weeks of catheter placement) and exit-site leaks were higher in the surgical group than in the peritoneoscopic group (5). PD catheter survival with peritoneoscopic placement was significantly better at 12, 24, and 36 months, and the overall catheter failure rate was higher in the surgical group. Similar results were shown in a separate randomized study (6). The avoidance of various complications by peritoneoscopic placement may relate to the decreased tissue dissection required with this technique.

Interventional nephrologists can also manage most of the complications. Bowel perforation can be a serious complication of the peritoneoscopic technique. However, a study of 750 PD catheter insertions performed by nephrologists using this technique found a low incidence (0.8 percent) of bowel perforations. All of these events were diagnosed and managed by the nephrologists (7). When a Veress needle (blunt, self-retracting end, smaller gauge) was used instead of a trocar, a study of 82 consecutive PD catheter insertions showed no bowel perforation (8). This technical modification deserves consideration.

A PD catheter that has migrated to the upper part of the abdomen can often be repositioned with use of a Foley catheter, or a new catheter can be reinserted during the same procedure, avoiding transfer to HD, placement of a hemodialysis catheter, and interruption of PD. Catheter insertion has also been shown to be successful in patients with a history of abdominal surgery and intraperitoneal adhesions. Thus, patients with previous abdominal surgery should not be summarily denied this procedure.

The peritoneoscopic technique is able to identify intraperitoneal adhesions and determine a patient's suitability for catheter placement.

In conclusion, interventional nephrologists can safely perform PD catheter insertion using imaging. This paradigm of care has great potential to improve the use of PD. ●

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