

# Chapter 23: Assisted Peritoneal Dialysis in Elderly Persons

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Peritoneal dialysis (PD) utilization is on the decline in many regions around the world. There are multiple potential contributors, but the role of barriers to self-care PD in an aging population is likely an important factor to consider. Providing home care assistance to support elderly persons on PD may help to overcome these barriers and increase the number of individuals that can be safely treated in the home. This chapter will cover the following issues: (1) what is home care assisted PD (HCAPD); (2) who is a candidate for HCAPD; (3) what are the logistical considerations when providing HCAPD; (4) how do patient outcomes on HCAPD compare with other dialysis modalities; and (5) is HCAPD a cost-effective therapy?

## DEFINING ASSISTANCE

Providing assistance to PD patients involves identifying and training an individual other than the patient to perform dialysis-related tasks. These tasks may include connecting the patient to a cycler, setting up the cycler, disconnecting from a cycler, or performing continuous ambulatory peritoneal dialysis (CAPD) exchanges. Spouses or other family members, paid caregivers, or visiting health care professionals in the home can provide assistance. Assisted PD can also be provided by staff in other settings including rehabilitation centers, retirement homes, nursing homes, and complex continuing care facilities. The reliance of PD patients on others for assistance in the home is often underappreciated and is borne out by studies showing that married individuals are more likely to receive PD and that patients who live alone are less likely to be treated by this modality. Evidence from the French PD Registry suggested that one in five patients required some form of assistance.<sup>1</sup> In the French ex-

perience, 8% of patients were assisted by family members and 14% received regular visits by home care nurses. For the remainder of this chapter, we will focus on the role of assistance provided by visiting home care nurses in the management of the elderly persons with end-stage kidney disease (ESKD). This specific form of assistance is HCAPD.<sup>2</sup>

HCAPD can be a valuable form of therapy for a number of reasons. First, the offer of home care support can provide reassurance to elderly persons and their families when considering PD as a treatment option. In this way, assistance may act as an incentive to some individuals to choose PD regardless of whether it is actually required. Second, HCAPD is a form of ongoing training or mentoring that allows patients to gain confidence performing PD-related tasks in a supervised setting. Cognitive impairment is common in the elderly dialysis population and may make it difficult for patients to learn what they need to know to perform PD independently during a traditional training program. With ongoing home care support and education by nurses, some patients eventually reach a point over weeks to months to feel comfortable enough to graduate to self-care PD. Third, HCAPD can act as a bridge therapy in individuals performing self-care PD who develop an intervening illness that makes it temporarily difficult to continue on PD. These individuals can be provided with home care support for as long as is required. The support can then be withdrawn as indicated when the patient recovers. In those that develop permanent barriers to self-

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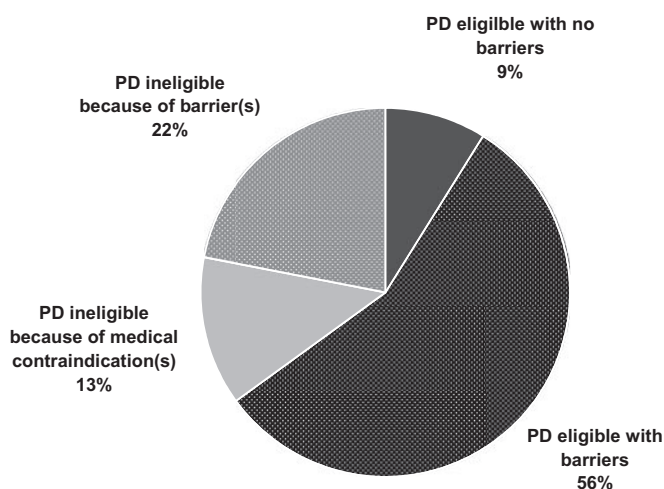
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care dialysis, the provision of home care assistance can mean averting PD technique failure. If assistance was not available, these patients would be forced to switch to in-center hemodialysis (HD). Fourth, HCAPD can function as a form of respite care for families or friends who are providing assistance to loved ones. If they are experiencing provider burnout and need a break, or would like to travel, home care nurses can temporarily provide much needed support to the patient. Elderly persons may not choose PD because they do not want to burden their families, and the availability of HCAPD can alleviate this concern. In addition, family members that wish to maintain employment but assist with PD when they are available can be supported with additional visits from a home care nurse during the work week. Finally, HCAPD can provide chronic assistance to elderly persons that have permanent mental or physical disabilities. This subgroup is the most resource intensive and requires the most care but represents only a portion of the spectrum of patients treated with HCAPD. This is important to remember when considering the economic and logistical impact of providing home care assistance to patients in a dialysis program.

## IDENTIFYING CANDIDATES FOR ASSISTED PD

In our program, all new dialysis patients and imminent starts are identified, assessed by a multidisciplinary team (physician, nurse, and social worker), and discussed at a weekly multidisciplinary meeting. This process facilitates the identification of important contraindications and barriers to PD therapy, including those that may not be well documented in the medical history (Figure 1). We define contraindications as a condition that make the patient ineligible for PD, in the judgment of the



**Figure 1.** This figure shows that only 13% of incident dialysis patients at Sunnybrook Health Sciences Centre had contraindications to PD therapy, whereas barriers were very frequent, even in those considered eligible for PD. The median age of patients evaluated was 73 yr.

medical team, regardless of available assistance in the home. Conditions that are frequently cited by the medical team as contraindications to PD in our ongoing study include morbid obesity, extensive abdominal scarring, ileostomies, colostomies, ileal conduits, gastric tubes, abdominal aneurysms, hernias, colitis, large polycystic kidneys, or other miscellaneous abdominal conditions.<sup>3-5</sup> Contraindications are somewhat subjective and likely vary among programs and physicians. It is not clear whether contraindications as defined above are more common in elderly persons.

Barriers on the other hand make self-care PD difficult and do seem to be more common in elderly persons.<sup>3-5</sup> They can be classified as physical, cognitive, psychologic, or social. Physical barriers include decreased vision, strength, manual dexterity, or mobility. Cognitive barriers include dementia, psychiatric conditions, learning disabilities, or language barriers. Psychologic barriers include fear of lack of supervision, fear of isolation in the home, or feeling generally overwhelmed by the possibility of performing of home dialysis. In our incident ESKD population with a mean age of 68 yr, the most common barriers were decreased strength (22%), decreased manual dexterity (22%), decreased vision (23%), immobility (8%), decreased hearing (7%), and anxiety (16%). Because barriers are more common in elderly persons, HCAPD patients are significantly older than self-care PD patients are. For example, in the French registry, the mean age of assisted patients was 72.6 yr old compared with 51.1 yr old for self-care PD patients.<sup>1</sup>

If there are no contraindications to therapy and patient barriers have been discussed, the patient's residence is reviewed and the supports available in the home to assist with dialysis are identified. Social barriers are residences that are either unstable (no permanent residence, unclean or unsafe residence) or ones that do not easily permit PD often because of rules and regulations (retirement homes, nursing homes). Considering all these factors, the team makes a final judgment as to whether a patient is eligible for PD. Acutely ill patients and patient with complex social circumstances often require discussion at multiple meetings until these issues are resolved. If a patient chooses PD, barriers are often clarified during the training period when the patient attempts to perform self-care. If home care assistance is required to overcome them, it is arranged.

## LOGISTICS OF PROVIDING ASSISTANCE

To provide HCAPD, the region where it will be available must first be defined, and a critical mass of nurses in that region must be trained. The density of the population, the number of patients requiring assistance that live within a region, and the travel distance between patients are important to consider. Our program was created in the city of North York, Canada, which is a borough in the Greater Toronto Area. North York has a population of approximately 600,000 people, and, at the time, our program served a prevalent PD population of about 80 patients. We worked with a single home care agency to train

20 to 25 nurses to provide up to two visits per days, 7 d/wk to patients that required assistance. Training was conducted by the home care agency educator, the PD nurses in our regional dialysis center, and the PD vendor. Nurses were taught to assess PD patients, disconnect patients from cyclers, set-up cyclers, and perform CAPD exchanges. Assistance was provided liberally at the inception of the program so that recently trained nurses were able to develop and maintain their skills. Visiting nurses reviewed patients with the PD staff in the regional program every week by telephone. Our PD nurses did not regularly supervise the visiting nurses in the patient's home, although studies from the French registry suggest it may reduce peritonitis rates.<sup>1</sup>

There are additional considerations. Whenever possible, we tried to match patients with a single nurse that would provide consistent care. We also had to make sure that home care visits were not missed and that patients and families knew whom to contact in the event that this did occur. It was also helpful if most patients were capable of disconnecting themselves from a cycler in the event of an emergency or a missed visit. This provides some flexibility for nursing staff as well because they can set up the cycler whenever is convenient during the day and return for an abbreviated visit at night to connect the patient for the evening. At the start of the program, we elected to use registered nurses exclusively for home care visits. Now, registered practical nurses and health care aids are also employed to provide assistance at the discretion of the visiting registered nurse. They primarily provide care to medically stable patients who have permanent physical barriers to PD (e.g., cannot lift bags on to cycler).

## PATIENT OUTCOMES ON ASSISTED PD

The introduction of HCAPD has meant that we have expanded eligibility for PD.<sup>1</sup> By offering HCAPD, we are treating individuals in the home that would not have been candidates for PD otherwise. As a result, it is important to track outcomes in these patients to ensure that this therapy is being provided safely. Relevant outcomes include patient survival, technique survival, peritonitis rates, and rates of hospitalization (Table 1).

Well-designed studies that are adequately powered to examine outcomes in HCAPD patients are currently lacking. However, preliminary evidence suggests that this population may have a relatively high rate of adverse events. HCAPD pa-

tients tend to be older and have a higher burden of comorbid illness (age range in published studies 72.6 to 77.1 yr; Charlson comorbidity index score 7.0 and 4.3 for HCAPD and self-care PD, respectively).<sup>1,6,7</sup> Risk adjustment is important in studies comparing HCAPD to other treatment modalities to account for these differences in case-mix severity but has been incompletely done to date.

Povlsen and Ivarsen<sup>7</sup> found lower patient and technique survival with HCAPD compared with self-care PD after adjustment for age, comorbidity (median number of conditions), and a limited set of baseline laboratory variables (urea, creatinine, albumin). The patient survival for autonomous PD and assisted PD was approximately 83 and 70%, respectively (data not reported, estimated from survival curves). In our unadjusted analysis, HCAPD was associated with a death rate of 0.12 per patient-year, which is on par with other modalities.<sup>1</sup> The limited evidence available to date makes it difficult to draw any conclusions about patient and technique survival among patients on HCAPD or how it compares to traditional, self-care PD.

It is unclear whether rates of peritonitis are higher on HCAPD. Verger *et al.*<sup>1</sup> performed an unadjusted analysis that showed higher peritonitis-free survival in HCAPD patients compared with individuals assisted by family members (70 versus 54%;  $P = 0.04$ ). However, this difference disappeared if visiting home care nurses had closer supervision. The actual peritonitis rates reported in the study were not statistically different between the two groups, although the trend was toward a higher rate in HCAPD patients (one episode every 36 mo versus one episode per 45 mo).

There is also conflicting evidence concerning rates of hospitalization in HCAPD. In a study by Lobbedez *et al.*,<sup>6</sup> 31 of 36 assisted PD patients were hospitalized within 15 mo of starting dialysis. This resulted in a hospitalization rate of 4.8 admissions per patient-year and a total of 45.6 hospital days per patient-year. We reported much lower rates of hospitalization in HCAPD patients (1.4 admissions per patient-year; mean of 23.5 hospital days per patient-year) that were similar to self-care PD and in-center HD.<sup>1</sup>

In summary, the evidence that is currently available does not allow any firm conclusions about the risk of important adverse events in HCAPD patients or how they compare with traditional dialysis modalities. Well-designed, adequately powered studies are required to address this issue. In the meantime, assisted PD patients should be considered a higher-risk population and should be monitored carefully.

**Table 1.** Summary of outcomes in HCAPD reported in the literature

Outcome	Result
Technique survival	58–86% at 1 yr
Peritonitis rate, one episode	One episode per 28–36 mo
Hospitalizations	1.4–4.8 per patient-year
Hospital days	23.5–45.6 per patient-year
Patient survival	83% at 1 yr

## ECONOMIC CONSIDERATIONS

There has been a concern among some that HCAPD is not a cost-saving therapy. It has been argued that the incremental cost associated with providing home care visits eliminates the savings traditionally associated with PD compared with in-center HD.<sup>8</sup> A recent review of European HCAPD programs

estimated that the cost of assisted PD ranged from €5356 to €18,200 for automated peritoneal dialysis (APD) [or continuous cycling peritoneal dialysis (CCPD)] and from €7280 to €23,400 for CAPD.<sup>9</sup> These estimates were based on the reimbursement formula in each country for assisted PD rather than the actual cost of providing care. More importantly, these calculations assumed that all HCAPD patients received the maximum number of home care visits available to them. In practice, this is not the case. In fact, we showed the average assisted patient only required 5.8 visits/wk in our program, resulting in an incremental cost of approximately \$12,000 dollars per PD patient, per year (assuming a cost of \$50 per home care visit). This would suggest that HCAPD is still cost saving compared with in-center HD. An additional consideration is that expanding HD capacity involves a significant capital investment to build or renovate new dialysis units that is not required to expand PD capacity. This has generally not been taken into account in costing studies, but is a relevant consideration for healthcare payers. Better information about the relative effectiveness of HCAPD compared with traditional dialysis therapies is needed. If outcomes on HCAPD are shown to be equivalent or better, a properly conducted cost-effectiveness analysis would be a valuable contribution to the literature. However, cost-effectiveness is not the only consideration when deciding whether to fund HCAPD. Countries may choose to fund it as a chronic disease management strategy because it is viewed as a way to maintain the independence of elderly persons receiving dialysis and to reduce the reliance on in-center HD.

## CONCLUSION

Assistance allows elderly persons with barriers to self-care PD an opportunity to be offered a home-based dialysis modality. The level of assistance required to adequately support elderly PD patients and their families is highly variable. Patients do not always require the maximal number of visits, and support may often be temporary. We outlined several important logistical considerations when starting a program of HCAPD. Successful programs need to develop a rigorous process for identifying appropriate candidates, train and monitor a critical mass of home care nurses, and track the outcomes of patients treated with this form of therapy. It is likely that HCAPD is a cost-saving strategy relative to traditional, in-center HD, but further work is needed to better detail the economic considerations for programs and payors.

## TAKE HOME POINTS

- Home care assistance may increase the number of elderly persons that are candidates for PD by helping to overcome barriers to self-care
- A rigorous multidisciplinary assessment can help to identify important barriers to self-care PD in elderly persons and to determine the need for home care assistance
- There are a number of logistical issues to consider when starting a program of HCAPD including the training of a critical mass of home care nurses in each region and providing them with supervision and support
- Well-designed, adequately powered studies are needed to further evaluate important patient outcomes on HCAPD and to determine the cost-effectiveness of this therapy relative to traditional modalities

## DISCLOSURES

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## REVIEW QUESTIONS: ASSISTED PERITONEAL DIALYSIS IN ELDERLY PERSONS

1. Patients may be provided assistance for peritoneal dialysis from:
  - a. Spouses or common-law partners
  - b. Sons or daughters
  - c. Paid caregivers
  - d. Home care nurses
  - e. All of the above
2. The best person or group to identify patients who are candidates for home care assisted peritoneal dialysis is to
  - a. Physician
  - b. Predialysis nurse
  - c. Multidisciplinary team
  - d. Home care nurse
  - e. Funding agency
3. The majority of individuals with ESRD starting chronic dialysis are:
  - a. Ineligible for PD because of contraindications to PD
  - b. Ineligible for PD because of barriers to self-care PD
  - c. Eligible for PD and have no barriers to self-care PD
  - d. Eligible for PD but have barriers to self-care PD
  - e. Other
4. The cost of home care assisted PD:
  - a. Is primarily determined by the use of CAPD in the PD population
  - b. Is primarily determined by the maximum number of visits available to the PD population
  - c. Is primarily determined the mean number of visits provided to the PD population
  - d. Is greater than in-center HD
  - e. Does not permit the use of registered nurses