

# Chapter 20: Hemodialysis in Elderly Patients

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When dialysis was a scarce resource worldwide, patients of advanced age were often excluded. However, this has changed dramatically. Hemodialysis (HD) of elderly patients has become routine, just as selected nonagenarians and centenarians now undergo invasive procedures such as coronary bypass or valve repair. As a consequence of the aging of the dialysis population, new issues have emerged. HD in elderly and very elderly patients has important differences from younger patients, and an understanding of these issues is critical in effectively guiding their care.

Before summarizing the available data, there is an important caution that applies to many studies describing elderly patients. Until recently, many studies used a cut-off of 65 yr old (or even younger) as a definition of elderly, grouping all patients over that age. However, the medical and social issues are clearly very different for a patient in her late 60s in comparison to another in her late 90s. Attention to the age of the study group is important when considering how study results might apply to an individual patient.

## EPIDEMIOLOGY

Older patients are now the rule rather than the exception in HD. According to USRDS data from 2006, nearly one half of incident dialysis patients in the United States are senior citizens, with the median age at dialysis initiation at 64.4 yr old.<sup>1</sup> Furthermore, the elderly are the fastest-growing group of incident dialysis patients, meaning that this median age will continue to increase.<sup>2,3</sup> Nearly all of these elderly patients employ HD, with only 3 to 5% using peritoneal dialysis (PD).

The rapid growth in this population will presumably be accompanied by a rise in per-patient dialysis expenditures, because costs for HD in a person over 65 yr average 10 to 35% more than for a person under 65.

## WHAT IS THE LIFE EXPECTANCY OF ELDERLY HD PATIENTS?

Unsurprisingly, mortality is considerably higher for elderly patients on dialysis than for elderly patients who are not. For example, the actuarial life expectancy of a 75-yr-old patient on dialysis is approximately 3 yr, as opposed to 11 yr for one not on dialysis.<sup>1</sup> A Canadian database study from the late 1990s found that patients older than 75 had survival at 1 and 5 yr of 69.0 and 20.3%, respectively, after HD initiation.<sup>4</sup> For the very old, such as those 90 yr and older when starting dialysis, survival is <50% at 1 yr.<sup>3</sup>

However, it is important to note that survival is influenced strongly by comorbidities such as vascular disease and cardiac disease. Once these are taken into account, the age of elderly patients is not an independent risk factor for increased mortality in some models.<sup>5</sup> This is consistent with the approach that the characteristics of an individual patient are more important than numerical age. Dialysis should not be withheld on the basis of age alone if otherwise appropriate.

## WHEN SHOULD HD BE INITIATED IN THE ELDERLY AND WHAT MORTALITY BENEFIT DOES IT CONFER?

The ideal timing of dialysis initiation for slowly progressive chronic kidney disease (CKD) in the elderly is not known, and this is likely to remain uncertain given the impossibility of randomization. For now, there are no criteria that are specifically tailored for elderly patients. In practice, elderly patients are actually started at a higher level of remaining kidney function than younger patients, although selection

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bias and errors in estimating GFR presumably confound this.<sup>6</sup> In addition, as time goes on, the trend is for elderly patients to be initiated at earlier and earlier stages of kidney dysfunction.<sup>3</sup> This will likely complicate comparisons between studies because some of these new patients being started on dialysis would have died before starting dialysis in prior years.

There are no randomized trials to assess the benefit of HD in the elderly once initiated. It is reasonable to conjecture that the benefit of dialysis might be limited when the risk of death from other causes is high. One registry study found that older patients with advanced CKD were more likely to die than to have dialysis, although it is unclear how many declined dialysis.<sup>7</sup> Another study in the United Kingdom followed a cohort of elderly patients who were offered dialysis when estimated GFR fell below 15 ml/min per 1.73 m<sup>2</sup>. The patients who accepted dialysis lived longer than those who declined it, but notably this difference was not found in those who had the highest comorbidities.<sup>8</sup> Selection bias and small sample size prohibit general conclusions from this study.

## HOW DOES HD COMPARE WITH PD IN ELDERLY PATIENTS?

As noted, only about 4% of elderly dialysis patients in the United States use PD. The rationale for this is not clear, because the proportion is much higher in other countries. Quality of life and mortality seem to be about the same between HD and PD in this age group in several studies,<sup>9,10</sup> although selection bias may confound this and others have found that subgroups (such as diabetics) may do better with HD.<sup>11</sup> A recent study reported poorer long-term survival among older patients on PD than on HD. However, this study defined old rather liberally as >60 yr of age, and differences between modalities only appeared several years after initiation.<sup>12</sup>

Overall, differences are not likely to be large. PD is likely an underused modality<sup>13</sup> and should still be offered freely to elderly patients. This topic is discussed in more detail in a separate chapter.

## WHAT IS THE OPTIMAL VASCULAR ACCESS STRATEGY?

There are several concerns regarding vascular access in the elderly, particularly that applying guidelines designed for the general population may lead to unnecessary procedures.<sup>14</sup> As in younger patients, the observation remains that catheters are definitely associated with higher mortality than other types of access. Unfortunately, the data on other aspects of vascular access in elderly patients are conflicting, with studies not reaching consensus on the preferred location or type of access. This topic is discussed in more detail in a separate chapter.

## WHAT FACTORS INFLUENCE QUALITY OF LIFE FOR ELDERLY PATIENTS ON HD?

Independent of mortality, quality of life is an important factor in decisions regarding HD in elderly patients. One survey found that most elderly patients would elect dialysis if offered but that relief of symptoms was a major goal rather than survival alone.<sup>15</sup> Overall, patients on HD rate their quality of life as poorer than age-matched controls.<sup>16</sup> This difference may be particularly dramatic for the elderly, who are at more risk of intradialytic hypotension<sup>17</sup> and may be more exhausted by a dialysis session. These issues do not mean that dialysis is contraindicated in elderly patients, but they are factors that need to be weighed in decisionmaking.

Traveling to an HD unit can be extremely time consuming, especially if independent driving is no longer an option. Furthermore, patients who depend on public or ambulance transportation rather than a car have poorer quality-of-life measures<sup>18</sup> and survival. Home HD addresses this issue but is relatively rare.

Overall, the prevalence of functional impairment is high in elderly dialysis patients. Patients on HD have a higher incidence of cognitive impairment than similarly aged patients with less severe CKD.<sup>19,20</sup> Almost all have some sort of functional disability.<sup>21</sup> Of particular concern is a lack of independent mobility, which is associated with a higher death rate.<sup>3</sup>

Hospitalization rates are high, with approximately 2 hospitalizations/yr; however, this is not appreciably different from that seen in younger dialysis patients,<sup>1</sup> although the duration of stay may be longer.

## WITHDRAWAL FROM HD

Sometimes HD in elderly patients is initiated with the understanding that it is a time-limited trial. Even if this is not the case, elderly HD patients are in general quite ill, and consideration should be given to the possibility of a short lifespan. It is worth noting that being on HD is associated with poor outcomes after cardiopulmonary resuscitation: in one series, only 8% of dialysis patients receiving CPR survived to hospital discharge and only 3% were alive 6 mo later.<sup>22</sup>

About 30% of patients aged 75 and over withdraw from their dialysis at the end of life.<sup>1</sup> On the other hand, withdrawal may not be required even when undergoing palliative care. Medicare hospice benefits apply to patients who continue on HD as long as the imminent cause of death is nonrenal, although the details of availability vary locally.<sup>23,24</sup>

## TAKE HOME POINTS

- The elderly dialysis population is growing, and nearly all use HD as a modality
- HD is not substantially different from PD in outcomes and both should be offered

- The mortality benefit of initiating HD is likely reduced in patients with the most comorbidities
- Life expectancy is short for many elderly patients after dialysis initiation, but this varies widely and is based more on comorbidities than on numerical age

## DISCLOSURES

None.

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## REVIEW QUESTIONS: HEMODIALYSIS IN ELDERLY PATIENTS

1. Hemodialysis initiation in the elderly:
  - a. Generally occurs at a later stage of kidney disease (lower eGFR) than in younger patients
  - b. Has leveled off in rate, after an increase over the last 10 yr
  - c. Is being started earlier (*i.e.*, at higher eGFRs) than in the past
  - d. Is governed by specific KDOQI guidelines covering this age group
2. Elderly patients on hemodialysis:
  - a. If over 90 yr old, are likely to survive less than 1 yr
  - b. If 75 or older, on average live 3 yr
  - c. Have life expectancy governed more strongly by comorbidities than by numerical age
  - d. Have life expectancies much less than elderly patients not on dialysis
  - e. c and d
  - f. All of the above
3. Regarding quality of life and disabilities for the elderly on hemodialysis:
  - a. Hemodialysis is associated with a high incidence of cognitive dysfunction
  - b. Approximately 15% of elderly hemodialysis patients have some sort of functional disability
  - c. Travel time to dialysis centers is not associated with decreased quality-of-life ratings
  - d. Hospitalization rate is approximately double that of non-elderly dialysis patients
4. Which of the following is true for elderly patients?
  - a. Hemodialysis is associated with shorter survival than peritoneal dialysis in observational studies
  - b. More than 95% of elderly patients use hemodialysis as their dialysis modality in the United States
  - c. Unlike in younger patients, catheters are not associated with worsened mortality compared with other access types
  - d. Dialysis must be discontinued for a patient to be eligible for hospice