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FAST FACTS AND CONCEPTS #191

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Background End stage renal disease (ESRD) is a highly prevalent and rapidly increasing condition. While dialysis prolongs life in patients with ESRD, life expectancy remains only a third to a sixth as long as similar patients not on dialysis. The overall one and five year mortality rates are 25% and 60%, respectively. Approximately 20% of ESRD patient deaths occur after a decision to stop dialysis, highlighting the importance of discussions of prognosis and goals of care with this chronically ill population. This Fast Fact reviews the current data regarding prognostication in patients receiving chronic hemo- and peritoneal dialysis. Note: renal transplantation reduces mortality and the following data do not consider patients with functioning kidney transplants.

Prognostic Factors Several patient-specific factors influence prognosis:

- *Age:* For 1-year increments beginning at age 18, there is a 3 to 4% increase in annual mortality compared to the general population. 1 and 2 year mortality rates go from 10 and 12% at 25-29 years of age, to 25% and 42% at 65-69 years, to 39% and 61% at 80-84 years of age.
- *Functional status:* the relative risk of dying within 3 years of starting dialysis is 1.44 for those with Karnofsky Performance Status scores of <70 compared to those with a score \geq 70 (see Fast Fact #13).
- *Albumin:* a low serum albumin level, both at baseline and during the course of dialysis treatment, is a consistent and strong predictor of death. For example, the 1 and 2 year survival of patients with an albumin of >3.5 g/dL is 86% and 76% respectively, compared to 50% and 17% if one's albumin is less than 3.5.

Prognostic Tools It has long been recognized that patient comorbidity is strongly correlated with prognosis in ESRD. An age-modified Charlson Comorbidity Index (CCI), which stratifies patients based on medical comorbidities and age, has been successfully used to predict mortality in dialysis-dependent patients (8):

Modified Charlson Comorbidity Index: Total score is the sum of the comorbidity points

Comorbidity Points				
1 point each for coronary artery disease, congestive heart failure, peripheral vascular disease, cerebrovascular disease, dementia, chronic pulmonary disease, connective tissue disorder, peptic ulcer disease, mild liver disease, diabetes 1 point for every decade over 40 (e.g. a 65 year old would receive 3 points).				
2 points each for hemiplegia, moderate-to-severe renal disease (including being on dialysis), diabetes with end-organ damage, cancer (including leukemia or lymphoma)				
3 points for moderate-to-severe liver disease				
6 points each for metastatic solid tumor or AIDS				
Modified CCI Score Totals	Low score (≤3)	Moderate (4-5)	High (6-7)	Very High (≥8)
Annual mortality rate	0.03	0.13	0.27	0.49

For example, a 66 year old male on dialysis with a history of CHF, COPD, and diabetes with retinopathy would have a CCI score of 9 and a nearly 50% chance of dying within a year. Using this, a provider could discuss with the patient his prognosis and use this to facilitate further discussion regarding planning for the future, including end-of-life decisions. The Index of Coexistent Disease (ICED), a general illness severity index, has also shown predictive power in ESRD. The scale's complexity and length however (it entails asking over 100 questions) limit its clinical usefulness.

Summary The age-modified CCI, in conjunction with other prognostic factors such as serum albumin and functional status, can be used to help facilitate discussions with dialysis-dependent patients and their families regarding goals of care and end-of-life planning.

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