

Box 2. Summary of Recommendation Statements**Guideline 1: Timing of Hemodialysis Initiation**

- 1.1 Patients who reach CKD stage 4 ($\text{GFR} < 30 \text{ mL/min/1.73 m}^2$), including those who have imminent need for maintenance dialysis at the time of initial assessment, should receive education about kidney failure and options for its treatment, including kidney transplantation, PD, HD in the home or in-center, and conservative treatment. Patients' family members and caregivers also should be educated about treatment choices for kidney failure. (*Not Graded*)
- 1.2 The decision to initiate maintenance dialysis in patients who choose to do so should be based primarily upon an assessment of signs and/or symptoms associated with uremia, evidence of protein-energy wasting, and the ability to safely manage metabolic abnormalities and/or volume overload with medical therapy rather than on a specific level of kidney function in the absence of such signs and symptoms. (*Not Graded*)

Guideline 2: Frequent and Long Duration Hemodialysis**In-center Frequent HD**

- 2.1 We suggest that patients with end-stage kidney disease be offered in-center short frequent hemodialysis as an alternative to conventional in-center thrice weekly hemodialysis after considering individual patient preferences, the potential quality of life and physiological benefits, and the risks of these therapies. (*2C*)
- 2.2 We recommend that patients considering in-center short frequent hemodialysis be informed about the risks of this therapy, including a possible increase in vascular access procedures (*1B*) and the potential for hypotension during dialysis. (*1C*)

Home Long HD

- 2.3 Consider home long hemodialysis (6-8 hours, 3 to 6 nights per week) for patients with end-stage kidney disease who prefer this therapy for lifestyle considerations. (*Not Graded*)
- 2.4 We recommend that patients considering home long frequent hemodialysis be informed about the risks of this therapy, including possible increase in vascular access complications, potential for increased caregiver burden, and accelerated decline in residual kidney function. (*1C*)

Pregnancy

- 2.5 During pregnancy, women with end-stage kidney disease should receive long frequent hemodialysis either in-center or at home, depending on convenience. (*Not Graded*)

Guideline 3: Measurement of Dialysis: Urea Kinetics

- 3.1 We recommend a target single pool Kt/V (spKt/V) of 1.4 per hemodialysis session for patients treated thrice weekly, with a minimum delivered spKt/V of 1.2. (*1B*)
- 3.2 In patients with significant residual native kidney function (Kru), the dose of hemodialysis may be reduced provided Kru is measured periodically to avoid inadequate dialysis. (*Not Graded*)
- 3.3 For hemodialysis schedules other than thrice weekly, we suggest a target standard Kt/V of 2.3 volumes per week with a minimum delivered dose of 2.1 using a method of calculation that includes the contributions of ultrafiltration and residual kidney function. (*Not Graded*)

Guideline 4: Volume and Blood Pressure Control: Treatment Time and Ultrafiltration Rate

- 4.1 We recommend that patients with low residual kidney function ($< 2 \text{ mL/min}$) undergoing thrice weekly hemodialysis be prescribed a bare minimum of 3 hours per session. (*1D*)
 - 4.1.1 Consider additional hemodialysis sessions or longer hemodialysis treatment times for patients with large weight gains, high ultrafiltration rates, poorly controlled blood pressure, difficulty achieving dry weight, or poor metabolic control (such as hyperphosphatemia, metabolic acidosis, and/or hyperkalemia). (*Not Graded*)
- 4.2 We recommend both reducing dietary sodium intake as well as adequate sodium/water removal with hemodialysis to manage hypertension, hypervolemia, and left ventricular hypertrophy. (*1B*)
 - 4.2.1 Prescribe an ultrafiltration rate for each hemodialysis session that allows for an optimal balance among achieving euvolemia, adequate blood pressure control and solute clearance, while minimizing hemodynamic instability and intradialytic symptoms. (*Not Graded*)

Guideline 5: New Hemodialysis Membranes

- 5.1 We recommend the use of biocompatible, either high or low flux hemodialysis membranes for intermittent hemodialysis. (*1B*)

MEDLINE and ClinicalTrials.gov to identify any recently completed studies.

ERT Study Selection and Outcomes of Interest

Studies were included if they were randomized or controlled clinical trials in people treated with, initiating, or planning to initiate maintenance HD for CKD. To be included, studies needed to report the

effects of an intervention on all-cause mortality, CV mortality, myocardial infarction, stroke, all-cause hospitalization, quality of life, depression or cognitive performance, BP or BP treatment, left ventricular mass, interdialytic weight gain, dry weight, or harms or complications related to vascular access or the process of dialysis. Observational studies considered by the Work Group that were not selected by the evidence