Hospital Admissions following Long and Short Interdialytic Intervals among Hemodialysis Patients

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Introduction
• An increased risk of cardiovascular (CV) hospital admissions after the long (2-day) interdialytic interval among hemodialysis (HD) patients has recently been reported.
• We assessed this association among a large, current cohort of Medicare HD patients, with additional analysis of all-cause admissions, infectious admissions, and the short (1-day) interdialytic interval.

Methods
• Data included 162,672 U.S. Medicare adult prevalent HD patients on January 1, 2010, alive on January 31, receiving HD three times weekly on a Monday/Wednesday/Friday or Tuesday/Thursday/Saturday schedule, and without a bridge hospitalization spanning the start of follow-up.
• HD schedule was determined from Medicare claims from January 18 to 31, 2010. Patients were excluded with an unscheduled or missed HD session during this two-week period.
• Included patients had Medicare Parts A and B coverage, were U.S. residents, and were age 20 years and older.
• Follow-up for hospital admissions began on February 1, 2010, and continued until censoring at death, modality change, end of Medicare payer status, recovery of renal function, deviation from HD schedule noted during a hospital stay, loss to follow-up, or December 31, 2010.
• Infectious and CV admissions were determined by principal ICD-9-CM diagnosis codes.
• Admissions rates by day of the dialysis week were adjusted using the Poisson model and direct adjustment:
  - Rates for all patients and by ESRD duration were adjusted for age, gender, race, Hispanic ethnicity, and primary diagnosis.
  - Rates by age, gender, and primary diagnosis were adjusted for the other four factors.
  - Rates by race and ethnicity were adjusted for age, gender, and primary diagnosis.

Results
• All-cause, CV, and infectious admissions by day of the HD week produced a sawtooth pattern with higher rates on the days with an HD treatment (HD1, HD2, and HD3) after the long and short interdialytic intervals than on the preceding and following days (Figs. 1–3).
• For all-cause, CV, and infectious admissions, the highest adjusted rates occurred on HD1, the day after the long interdialytic interval, (respectively, 1.9 times the rate on days without HD, 1.5 times the rate on days after the long interdialytic interval, and 2.5 times the rate on days after the short interdialytic interval).

Conclusions
• Patterns were consistent across demographic groups: admission rates were lowest on the days after the long interdialytic interval, followed by the days after the short interdialytic interval, and then lowest on days without dialysis (Fig. 4).
• The days after the long and short interdialytic intervals among HD patients were associated with elevated all-cause and infectious admissions in addition to CV.
• Results suggest a potential need to further evaluate the U.S. standard frequency of HD treatments.