

Introduction

Although hemoglobin (Hb) monitoring is a critical component in managing anemia in dialysis patients, physician monitoring practices differ, in part because evidence to determine optimum Hb testing frequency is lacking. Specifically, the minimum frequency of Hb determination needed to maintain optimum Hb outcomes is not known.

To assist physicians in decision-making about anemia and to provide evidence for use in the design and evaluation of anemia management protocols, we assessed facility-level Hb testing patterns and their impact on anemia outcomes.

Methods

- We reviewed data from a large US dialysis provider's database from the year 2010 (Table 1) to evaluate:
 - dialysis facility Hb testing patterns,
 - mean facility Hb results, and
 - the percentage of patients with Hb in range (10–12 g/dL).
- We categorized facilities by the mean per-patient Hb lab tests obtained per quarter.
- We obtained Least Squares Means estimates from patient-weighted Generalized Linear Models (GLMM) to predict the percent of patients with Hb in 10–12 g/dL range and mean Hb levels from number of Hb tests.

Results

Table 1. Demographics

	2010
N	134,238
Mean age ± SD (yrs)	62.2 ± 15.1
% Male	55.9%
Race and Ethnicity	
% African-American	36.8%
% Hispanic	16.0%
% Asian, Pacific Islander	4.0%
% Native American	1.4%
% Unknown	0.1%
% with Diabetes	45.0%
Mean vintage ± SD (yrs)	3.94 ± 3.7
Vintage year (min-max)	0.08 - 43.25
Mean BMI ± SD	28.1 ± 7.4

Figure 1. Frequency of Hemoglobin Testing by Facility

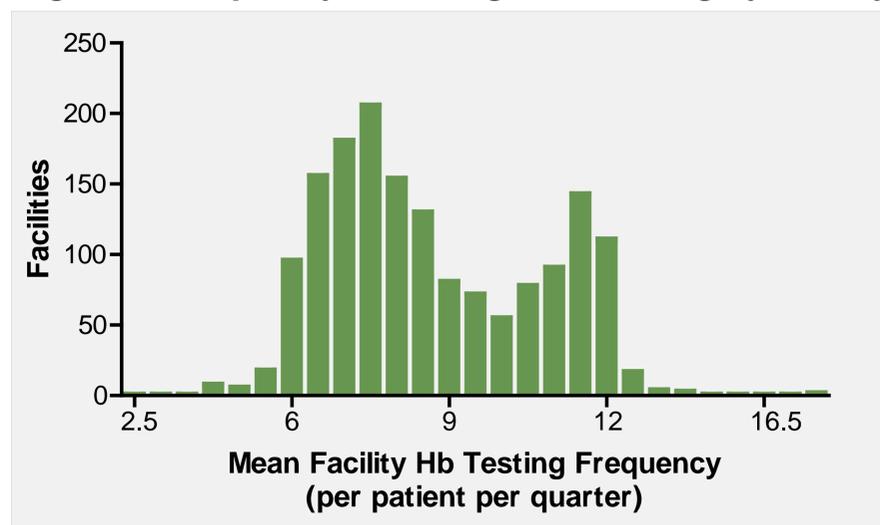


Figure 2. Hemoglobin Levels by Facility Hb Test Frequency

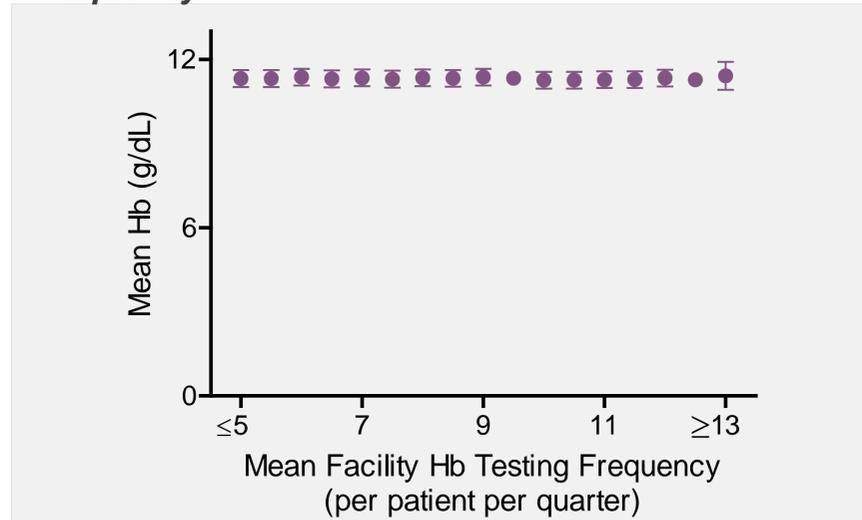
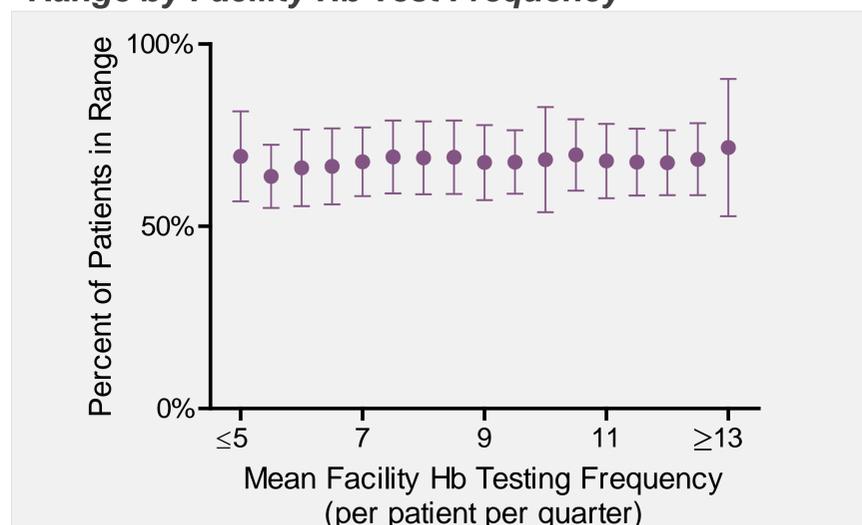


Figure 3. Patients with Hemoglobin in 10–12 g/dL Range by Facility Hb Test Frequency



- The frequency of Hb testing based on observed physician ordering preference varied from 2.5 to 19.5 tests/quarter (Figure 1).
- Physicians at 96% of facilities, treating 97% of patients, tested Hb 6-12 times per patient per quarter.
- Neither mean Hb levels ($p = 0.08$; Figure 2) nor the percent of patients in Hb range ($p = 0.28$; Figure 3) varied significantly with greater Hb testing frequency.
- Percent of patients in Hb range (10-12 g/dL) ranged from 63.7% to 71.6% over the full range of Hb testing frequencies.

Conclusions

- When examined over a range from weekly to monthly, Hb test frequency shows no discernable relationship to Hb outcomes.**
- This finding bears directly on the design and evaluation of anemia management protocols.**

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