

Association of Frequency of Lab Testing with MBD Outcomes

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INTRODUCTION

Very little is known about how frequently labs tests need to be performed to drive clinical decisions which results in the best clinical outcomes for mineral and bone disease (MBD). Frequency of lab testing ordered varies widely among health care professionals. However, increased lab testing consumes valuable medical resources, an important consideration with the impending implementation of capitation in United State (U.S.) end-stage renal disease (ESRD) reimbursement.

We sought to understand the facility-level impact of this practice pattern on MBD outcomes and medication utilization.

METHODOLOGY

- A large U.S. dialysis provider's database was reviewed in March 2010 to categorize dialysis facility lab testing patterns (Table 1).
- We categorized facilities by the mean number of reported lab tests per patient dialyzing in that facility per quarter in 2009.
- We then correlated these facilities with achievement of MBD outcomes from the last reading for each quarter for 2009 to normalize for varying numbers of lab results between categories using the KDIGO MBD ranges.

RESULTS

Table 1. Patient Demographics

	Patients
N	127,935
Age (yr)	62.0 ± 15.2
% Male	55.8%
<i>Race and Ethnicity</i>	
% African American	36.7%
% Hispanic	15.8%
% Asian, Pacific Islander	3.8%
% Native American	1.4%
% Other	0.1%
% Diabetic	45.0%
Vintage (yr)	3.8 ± 3.7
BMI	27.9 ± 7.3

Table 3. Phosphorus Levels and Percent of Patients in Recommended Range Stratified by Facility Testing Frequency

Tests Per Pt Per Quarter	Facilities	Mean Facility Phosphorus (mg/dL)	Mean Facility % Pts with Phos ≤ 5.5 mg/dL
1	171	5.20 ± 0.43	66.1 ± 12.1%
1.5	786	5.21 ± 0.37	68.8 ± 11.0%
2	480	5.29 ± 0.39	65.4 ± 11.9%
2.5	81	5.27 ± 0.32	65.7 ± 13.3%
3	14	5.21 ± 0.80	61.6 ± 31.0%
3.5	4	5.15 ± 0.13	66.6 ± 2.4%
4	5	5.28 ± 0.29	64.1 ± 7.5%

Table 2. Parathyroid Hormone (PTH) Levels and Percent of Patients in Range Stratified by Testing Frequency

Tests Per Pt Per Quarter	Facilities	Mean Facility PTH (ng/ml)	Mean Facility % Pts with PTH 150-600 ng/ml
1.5	39	340.5 ± 118.7	70.2 ± 10.5%
2	207	301.0 ± 67.6	71.1 ± 11.3%
2.5	375	331.9 ± 77.2	70.7 ± 10.3%
3	575	343.0 ± 79.5	70.3 ± 9.5%
3.5	170	340.0 ± 94.5	72.1 ± 9.9%
4	97	325.2 ± 69.5	74.6 ± 10.3%
4.5	48	325.3 ± 80.8	74.2 ± 14.0%

Table 4. Calcium Levels and Percent of Patients in Recommended Range Stratified by Facility Testing Frequency

Tests Per Pt Per Quarter	Facilities	Mean Facility Calcium (mg/dL)	Mean Facility % Pts with Ca ≤ 9.5 mg/dL
1	386	9.03 ± 0.17	83.4 ± 9.9%
1.5	623	9.03 ± 0.15	84.5 ± 9.7%
2	443	9.03 ± 0.17	83.1 ± 8.9%
2.5	67	9.06 ± 0.16	82.4 ± 8.4%
3	13	8.96 ± 0.75	87.7 ± 12.5%
3.5	4	8.99 ± 0.09	83.4 ± 3.1%
4	5	9.06 ± 0.04	82.7 ± 4.7%

SUMMARY of RESULTS

- Frequency of PTH testing based on physician ordering preference varied significantly (Table 2).
- Most facilities tested calcium (Ca) and phosphorus (P) monthly on average, but some facilities appeared to test more frequently (Tables 3 and 4).
- Despite this, mean MBD values for PTH, Ca, P did not vary significantly with greater lab testing frequency, nor did the percentage of patients within a given range.

KEY LEARNINGS

- ✓ More frequent MBD testing was not associated with significant improvements in MBD outcomes.
- ✓ Because patients with-out-of-range are tested more frequently than those with within-range results, further research is warranted to evaluate whether improved management results in less frequent testing over time.

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