

# FREQUENT HEMOGLOBIN (HGB) MONITORING (12X/MONTH) CAN INFORM CLINICAL AND ORGANIZATIONAL DECISION MAKING

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## Introduction

The focus on compliance with changes in erythropoietin (EPO) payment policies and guidelines potentially frustrates the long-term titration to stable doses that is required. As part of a prospective, case controlled study of per hemodialysis treatment measurement of hemoglobin (critline), it was possible to examine the other routine factors that influence out-patient renal anemia management (n=49), and to assess the utility of 12x/month hemoglobin levels (Hgb) in detecting trends in Hgb trends.

## Methods

A written unit wide protocol of EPO management was followed based on the monthly lab Hgb. The staff was blinded to the critline Hgb results. With 12x/month Hgb monitoring, trends in patients Hgb, adjustments in EPO doses, as well factors limiting adequate anemia management were assessed.

## Results

43 % of patients had predictable, orderly declining or stable slopes of Hgb change, with minor reductions in EPO dose. The factors that impinged on management could be divided into Organization and Patient related issues.

Organizational issues: 1) Missing data, rate of 4% including laboratory results and clinical events. 2) There were 4 episodes of 'therapeutic inertia', where little changes to EPO dose occurred despite a downward trend in Hgb. 3) 9 episodes of 'therapeutic over-enthusiasm'. These responses were not protocol driven. 4) In 4 cases the thrice-weekly Hgb gave more useful information than the monthly blood Hgb. (Fig1)

Figure 1

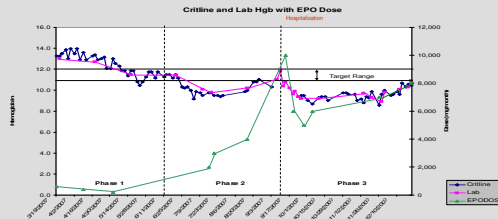
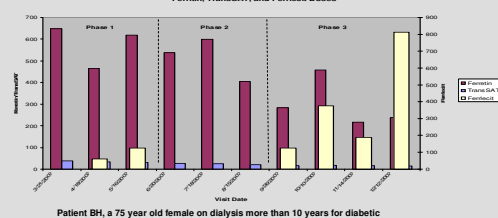


Figure 2



Patient BH, a 75 year old female on dialysis more than 10 years for diabetic nephropathy. Her past medical history includes diabetes and hypertension for over 20 years complicated by retinopathy, hyperlipidemia, obesity, hypothyroidism, and atrial fibrillation. Medications include EPO, sevisipar, renelgel, nephrocaps, synthroid, lovenox, insulin, reglan, provaschol, midodrine, zinc, and vitamin C.

In Fig. 1, with 12x/month Hgb monitoring, a downward trend was apparent between 4/07-6/07 but EPO dose was not increased because she remained in target range by monthly monitoring. By the following month, she had drifted out of range prompting increase of EPO dose.

PI was hospitalized for sepsis and GI bleed during September and October of 2007 in which multiple data points were missed with subsequent out-of-range drop in Hgb.

## Results Cont.

PI factors: 1) 16% of pts had resistance to EPO (> 300u/kg/wk). High ferritin values suggested undiagnosed clinical acute phase responses in 3 patients. 2) 23% of patients were hospitalized over the three month data collection period and two transfused with blood. These data indicate the routine activities that confounds the management of renal anemia, even when appropriate protocols are in place.

## Conclusion

More frequent Hgb measurements have the potential to more quickly establish responses to EPO dose changes and confirm trends earlier. This will allow more rapid and confident titration to stable doses and prevent Hgb cycling. Some unstable/resistant patients are likely to remain beyond such titration. Protocol management is ineffective unless the context and logistics are carefully designed and clinicians comfortable enough not to over-ride decision support. Facility protocols are a necessary but insufficient tool. This ongoing study will assess the effect of a computer algorithm on anemia management assessed by the every treatment critline.

## References

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