

Potential Contribution of Every Other Week Administered Erythropoiesis Stimulating Agents to the Operational Efficiency of Anemia Management in a Haemodialysis Center: an Explorative Pilot Study in a Haemodialysis Center in Switzerland

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BACKGROUND

- Anemia is common in patients with end stage renal disease (ESRD) and is typically treated in dialysis facilities using an erythropoiesis stimulating agent (ESA).
- Erythropoiesis stimulating agents such as epoetin alfa required treatment to be administered multiple times per week (eg, thrice weekly [TIW]). Darbepoetin alfa, a longer-acting ESA, requires less frequent dosing at either weekly (QW), every other week (Q2W) or once a month (QM) dosing in the dialysis population.^{1,4}
- Less frequent dosing using darbepoetin alfa is based on an initial conversion ratio of 200 IU:1 mcg epoetin:darbepoetin alfa, per the approved label in Switzerland.⁴ This has achieved savings in doses (~20%) needed to achieve comparable Hb outcomes (11 g/dL < [Hb] < 13 g/dL).^{5,6}
- Previous studies have focused on the time needed for ESA administration at dialysis facilities.⁷ However, the total operational costs associated with ESA delivery using different dosing frequencies (TIW, QW, Q2W or QM) in ESRD patients have not been adequately studied.

OBJECTIVES

- To characterize the entire process of ESA delivery, from the initial drug order placement to the incineration of waste products after ESA administration.
- To evaluate the impact of changing from the current distribution of ESA products and dosing frequencies to less frequent dosing (Q2W) using darbepoetin alfa in Swiss patients undergoing dialysis.

METHODS

- The Mercurius study was conducted at multiple facilities throughout Europe. Here, we report preliminary results from 83 patients at our center in Lausanne.
- The general process for ESA administration is shown in Figure 1.
- Structured interviews with facility staff were used to develop a comprehensive list of processes that are associated with and routinely followed during the administration of ESAs to ESRD patients (Figure 2). This includes activities specific to the ordering of the drug, the administering of the drug to patients, and the disposing of waste products after administration of the drug.
- Activities were evaluated to determine if less frequent dosing affected the amount of time needed or the quantity of materials used during the entire process of ESA administration.
- The time and materials associated with each activity were measured by observing each activity on multiple occasions.
- Labor costs were derived from actual fully loaded wages for the staff involved in each activity. These costs were then applied to the amount of time required for the staff member to complete each activity.
- Material costs were abstracted directly from the facilities' accounting records.
- The changes in costs from the current treatment paradigm to Q2W dosing are summarized.

Figure 1. Administration of Erythropoietic Stimulating Agents in ESRD Patients

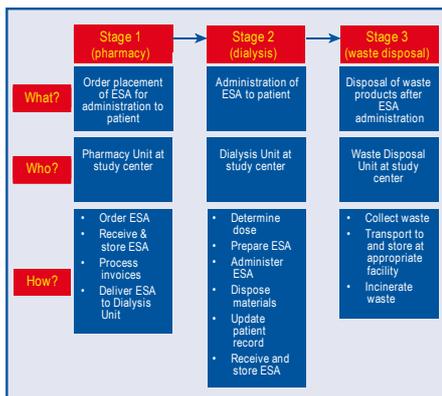
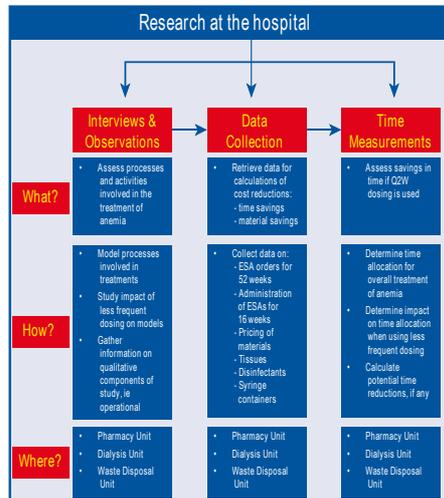


Figure 2. Data Collection Methodology



RESULTS

Dosing Frequency of ESAs

- In the current situation, most patients were receiving an ESA one or more times each week.
- The most frequently used regimen was QW, with 48% of patients.
- The dosing frequency distributions are shown in Figures 3a (overall) and 3b (by ESA).

Figure 3a. Dosing Frequency - overall

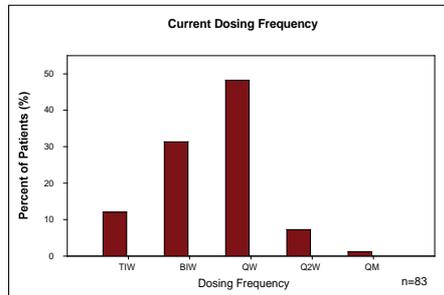
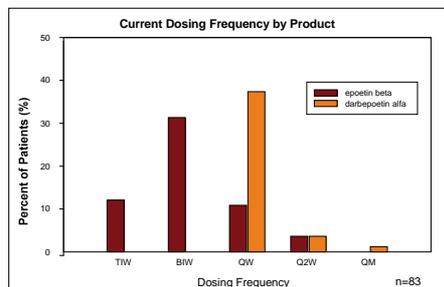


Figure 3b. Dosing Frequency - by ESA Administered to Patients



Cost Associated With ESA Delivery

- The majority of costs associated with ESA delivery was concentrated in the Dialysis Unit, in particular the costs of labor at the Unit itself (Tables 1a and 1b).
- The current cost structure appeared to be positively associated with the number of patients treated.
- Costs associated with labor and materials were predicted to decline with less frequent ESA administration (Figure 4).
- The largest reductions were found in the labor costs at the Dialysis Unit due to the length of time required to prepare and administer the ESA injection to a patient.
- Cost reduction in materials within the Dialysis Unit were driven by decreases in amount of disinfectant liquid and tissues.
- Converting all patients from current dosing interval to Q2W dosing could result in labor savings of 350 hrs per yr, translating into 8.8 working weeks of a full time nurse.

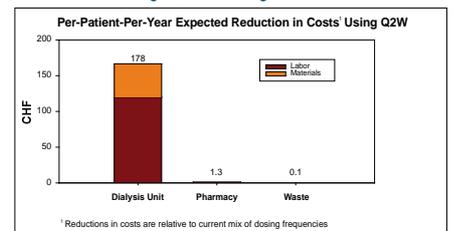
Table 1a. Annual Variable Costs Associated With ESA Administration Using Current Dosing Regimens

Operation Unit (N=83)	Annual Operating Costs (CHF)	
	Labor	Material
Pharmacy	1'478.60	
Dialysis	21'860.30	6'414.40
Waste Disposal	1.30	16.60
Total	23'340.20	6'431.00

Table 1b. Annual Variable Per Patient Costs Associated With ESA Administration Using Current Dosing Regimens

Operation Unit (N=83)	Annual Operating Costs (CHF)	
	Labor	Material
Pharmacy	17.80	
Dialysis	263.40	77.30
Waste Disposal	0.00	0.20
Total	281.20	77.50

Figure 4. Estimated Annual Variable Cost Reductions Per Patient Using Q2W Dosing



- Switching all patients to a Q2W regimen could result in cost savings of 14'890 CHF per year.

Figure 5. Consumption of Materials

	Current	Q2W
Number of syringes	8463	3328
Bottles of disinfectant	59.21	19.62
Number of disinfectant wipes	13026	4316

- Q2W administration leads to less material consumption. Number of syringes could be reduced by 61%, number of disinfectant bottles by 67% and number of disinfectant wipes by 67%.

DISCUSSION

- There are quantifiable labor and material cost benefits associated with less frequent dosing of ESAs in the anemic dialysis population.
- Total costs of ESA administration may be reduced by converting to every other week (Q2W) administration.
- The primary drivers of cost reduction due to less frequent dosing are labor and material costs at the Dialysis Unit.
- Because of the lower frequency of injecting, the risk for mistakes and accidents could go down in all units.
- An ecologically relevant effect of the Q2W dosing is the reduced waste production.

ACKNOWLEDGMENTS

- The authors would like to thank the study site personnel for their participation in this study. This study was funded by Amgen Inc.

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