

EPO AND DRUG SAVINGS WITH ULTRAPURE WATER AND DIALYSATE

Erythropoiesis-stimulating agents used to be a profit center for some dialysis providers; with the reimbursement changes, they have become a cost center. EPO (and other drugs) are a large portion of 'per treatment' costs. EPO usage in the US is significantly higher than EPO usage in Europe. The average EPO dose/treatment in Europe is 2089 units; while the average dose in the US is 5000 units¹ (The 2006 US Renal Data System {USRDS} indicates an average of about 20,000 units/wk. per person). This difference of approximately 3000 units, at an average cost of \$10 per 1000 units, is a savings of \$20+ per treatment. Assuming 156 treatments a year, this would result in \$3120+ in savings per patient/yr.

Potential reasons for this difference include:

- European standards for RO water vs US
 - AAMI – 200 cfu vs ERA-EDTA 100cfu
 - AAMI Endotoxin level 2 (EU/ml) vs ERA-EDTA.25 (EU/ml)
- Different bicarb delivery method
 - Europe – 90% using bicart type devices
 - No central bicarb systems in Europe
 - Bicart eliminates potential growth for biofilm/bacteria/endotoxins

Dr. Richard Ward, Univ. of Louisville, has listed the following potential advantages of water and dialysis fluid of high microbiological purity.²

- Less inflammatory stimulus
- Reduced incidence of β 2-microglobulin amyloid disease
- Improved responsiveness to erythropoietin
- Improved nutritional status
- Better preservation of residual renal function

The Nephros Dual Stage Ultrafilter (DSU) can be incorporated into the water feed line and the Nephros SafeSpout Ultrafilter (SSU) can be incorporated into the bicarb line to filter the fluids to .005 micron, which would provide ultrapure dialysate. These filters would provide the benefits listed above, thus potentially enabling the physician to lower the dose of EPO and other drugs. The Nephros ultrafilters are significantly better than the current filters that machine manufacturers have installed.

Estimated filter costs and savings for a clinic with 20 stations and 70 patients.

Each dialysis machine would have a DSU filter on the water line and an SSU filter on the bicarb line. Point-of-use filtration (just prior to the machine) reduces the chance of contamination from water or bicarb lines. The filters should last **1 year post RO**. Calculations: \$290/DSU x 20 filters/yr = \$5,000 plus \$120/SSU x 20 filters/yr = \$2,400; for a total cost of \$8,200. Divide by 10,920 tmts/yr = filter cost of \$.75/tmt.

The cost savings from using less EPO (\$20+/tmt) would be reduced by the filter cost of \$.75/tmt. Net savings would be \$19.25+/tmt. Assuming only 50% of these savings are realized; \$9.63 x 10,920 treatments/yr. at this size clinic would result in \$105,160 in savings each year. Plus, the patient receives a better treatment.

For studies showing the DSU's expected life, please email us at ols.svc@gmail.com

¹ Erythropoietin dose variation in different facilities in different countries and its relationship to drug resistance. Kidney Intl (2003) 64, S78-S86; doi: 10.1046/j.1523-1755.64s87.12.x

² Minimizing the Impact of Water-Borne Bacteria on Hemodialysis Patients, Dr. Richard Ward, Univ of Louisville, A Webber Training Teleclass