

TSAT and Serum Ferritin Increases Observed in Ferric Citrate Clinical Trials May Lead to Dialysis Cost Savings

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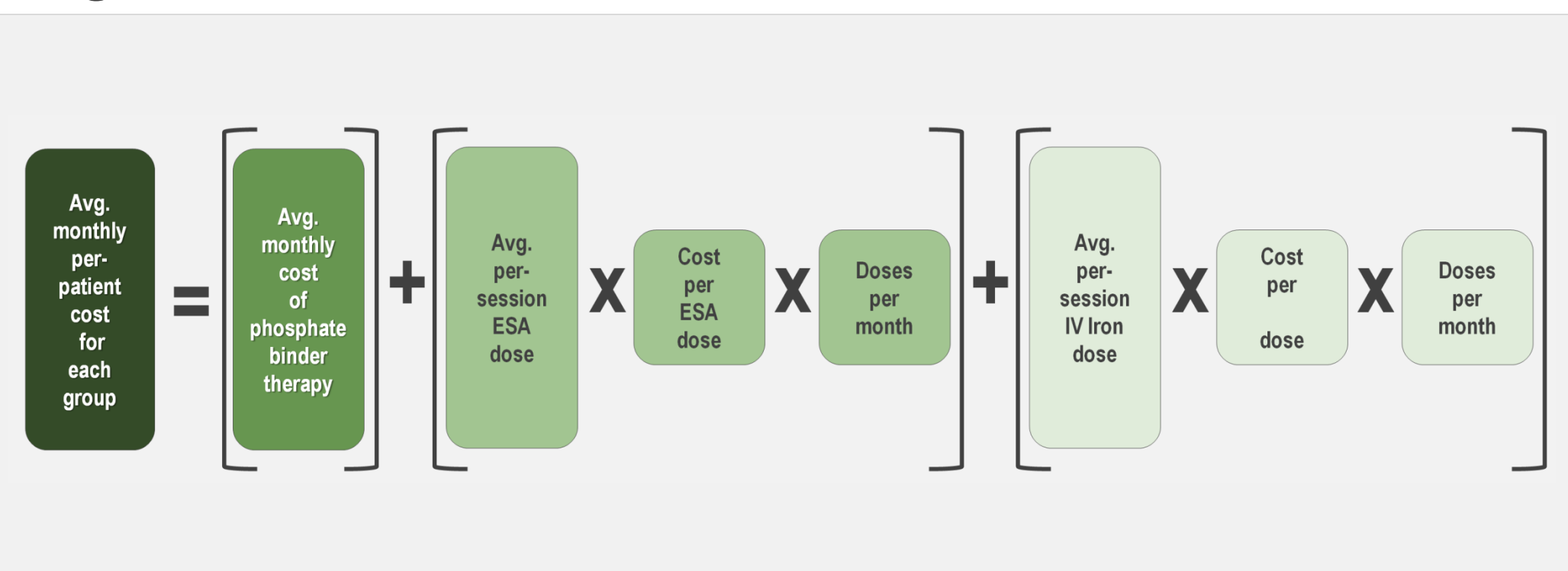
Introduction

- Ferric citrate, a novel, investigational phosphate binder for the treatment of hyperphosphatemia in dialysis patients, has been shown in clinical trials to increase serum ferritin and saturated transferrin (TSAT) and reduce use of erythropoiesis-stimulating agents (ESAs) and intravenous (IV) iron.^{1,2}
- We developed a cost-offset model quantifying potential cost savings associated with reduced ESA and iron dosing observed in hemodialysis (HD) patients experiencing similar increases in iron storage markers.

Methods

- The economic model was created to derive expected monthly costs for ferric citrate and comparator binders in terms of phosphate binder, ESA and IV iron costs. No other costs were included in the model.
- The model calculates the expected monthly cost, first assuming all patients are treated with one of the comparator binders, and a second time, assuming all patients are treated with ferric citrate; the difference between the two models represents the incremental cost of ferric citrate.
- The average per session ESA dose for ferric citrate is adjusted to reflect expected changes due to associated rises in TSAT and ferritin.

Figure 1. Model Calculation

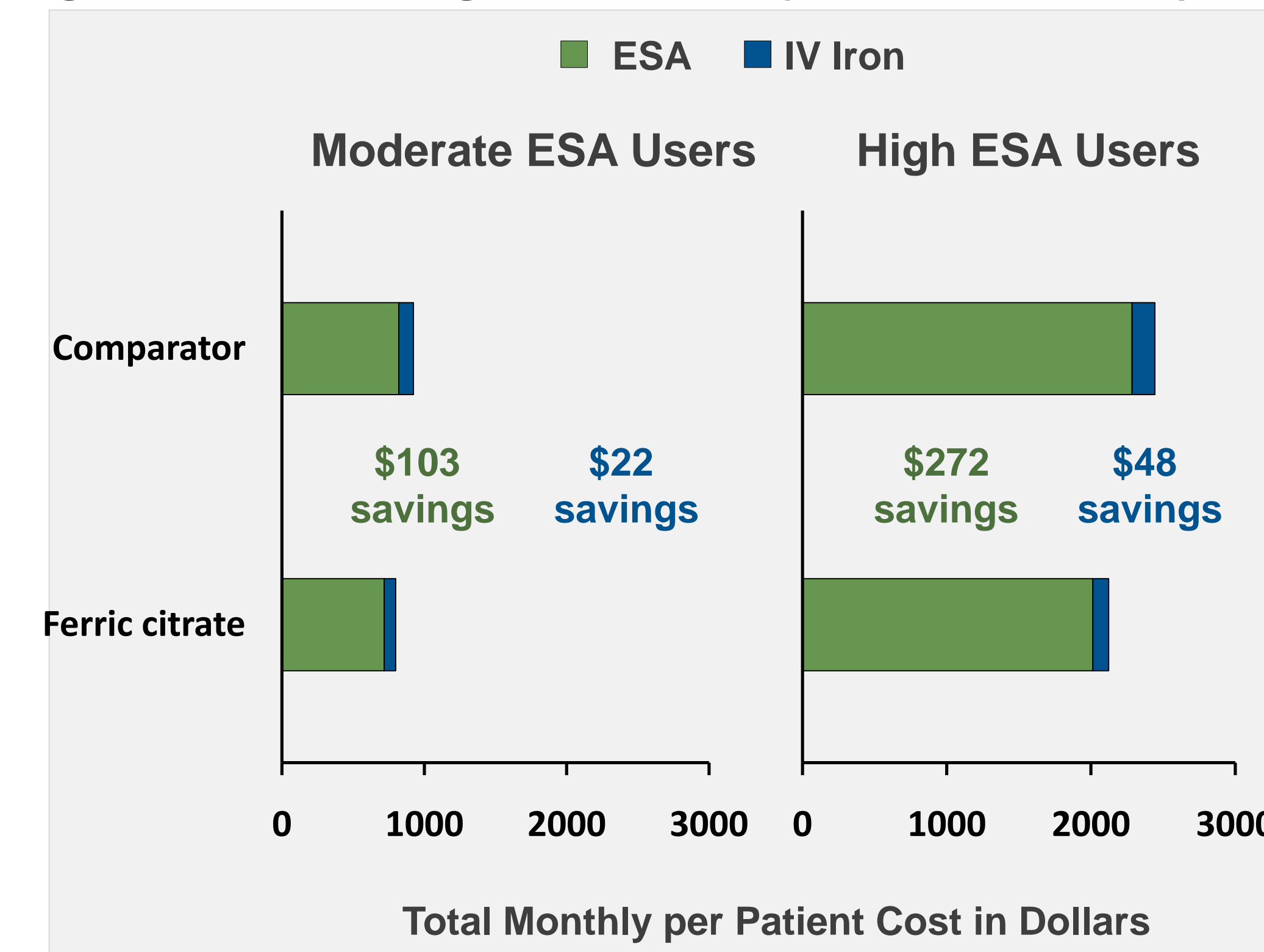


- Model inputs**
 - The model assumed efficacy of ferric citrate and comparator binders was equivalent to manage bone and mineral disease.
 - Unit costs for phosphate binders, ESAs, and IV iron were derived from 2011 published sources.^{3,4}
 - We assumed price equivalence between ferric citrate and the comparator phosphate binders in the base case.
 - Average monthly ESA and iron utilization were derived from Bond et al. 2011 ASN Poster SA-PO2647.
 - Changes in iron and ESA dosing associated with ferric citrate were also estimated from Bond et al., assuming rises in TSAT and ferritin were consistent with those in the Bond study.
- Model outputs**
 - Per patient monthly costs were calculated for ferric citrate and the comparator binders as described.
 - The incremental cost of ferric citrate was calculated by subtracting the per patient monthly cost of the comparator binders from the per patient monthly cost of ferric citrate.
 - Results are reported for the overall patient population, and for moderate (4,500-<9000 units per sessions) and high (≥9,000 units per session) ESA users separately.
 - Results are presented stratified by phosphate binder costs, ESA costs and IV iron costs.

Results

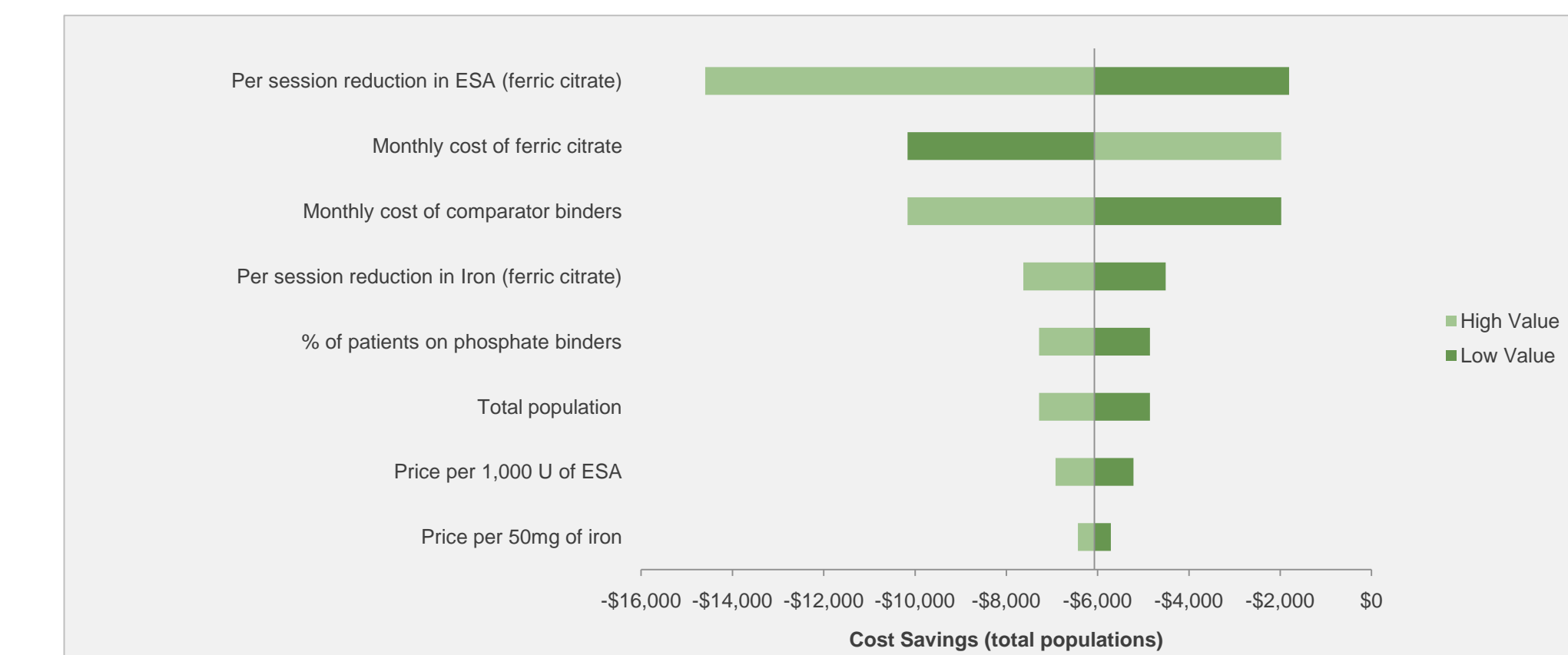
- Cost model**
 - Expected savings:
 - For high ESA users is \$320/patient/month
 - For moderate ESA users is \$125/patient/month
 - For patients overall is \$90/patient/month
 - In a 96-person clinic with the same patient types and distribution of resource utilization as measured in our study, and assuming that 70% of patients are prescribed phosphate binder therapy, the total anticipated monthly savings would be \$6,071 with the use of ferric citrate.

Figure 2. Cost Savings Breakdown (Per Patient/Month)



- Sensitivity analysis**
 - One-way sensitivity analyses show that reductions in ESA utilization associated with ferric citrate have the largest impact on model outcomes, followed by the price of the phosphate binders themselves.

Figure 3. Sensitivity Analysis



Summary

- Our cost model suggests that the use of an iron-containing phosphate binder like ferric citrate could produce considerable cost savings for dialysis clinics. Cost savings are greater with higher ESA use.
- Expected reductions in ESA use, which have been associated with ferric citrate treatment, contribute the majority of savings in our cost-offset model.

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