

Mesna Utilization in Current Cancer Care Alberta Regimens versus Established Guidelines: A Cost-Minimization Analysis

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Background

Ifosfamide is a cytotoxic antineoplastic agent associated with dose-dependent hemorrhagic cystitis (HC), which is mitigated through prophylactic administration of mesna. At Cancer Care Alberta (CCA), mesna dosing in current regimens exceeds that recommended in established guidelines¹⁻³, with unclear financial and operational impacts. As standard dosing has already been shown to reduce HC incidence from approximately 40% to 5%⁴, additional dose escalation is unlikely to provide meaningful clinical benefit.

Standard Mesna Dosing Recommendations ²	Current CCA Mesna Dosing (Most Protocols)
20%* given over 15-30 minutes at hour 0 + 20%* given over 15-30 minutes (or PO equivalent) at hour 4 (hour 2 if PO) + 20%* given over 15-30 minutes (or PO equivalent) at hour 8 (or hour 6 if PO) = 60%*	15%* given over 15-30 minutes (<i>immediately prior to ifosfamide</i>) + 100%* given over 4 hours, starting at hour 0 (<i>concurrently with ifosfamide</i>) + 15%* given over 15-30 minutes at hour 6 = 130%*

*Dosing is expressed as a percentage of the ifosfamide dose

The primary objective of this study was to quantify potential cost savings of aligning CCA mesna dosing with standard intravenous (IV) guideline-recommended regimens. The secondary objective assessed further potential cost and chair time savings associated with transitioning to a standard IV/oral mesna regimen.

Methodology

Design: Multicentre retrospective chart review conducted at all CCA sites between January 1, 2023, and December 31, 2024.

Inclusion Criteria:

- Adults (≥18 years) who received intermittent IV mesna for prophylaxis of ifosfamide-induced HC

Exclusion Criteria:

- Age <18 years old
- Continuous IV mesna infusions
- Outpatient hematology regimens (already guideline-concordant)

Data Collection: Patients were identified using an Epic Workbench report that captured ifosfamide-containing regimens.

Analysis: Actual mesna doses were compared with expected guideline-based doses calculated as percentages of the ifosfamide dose:

- Standard IV: 60%
- Standard IV/PO: 20% IV+ 40% PO +40% PO

Chair time was estimated from infusion start to finish (per protocol).

Ethics: Approved by the Health Research Ethics Board of Alberta (HREBA) Cancer Committee in November 2024.

Results

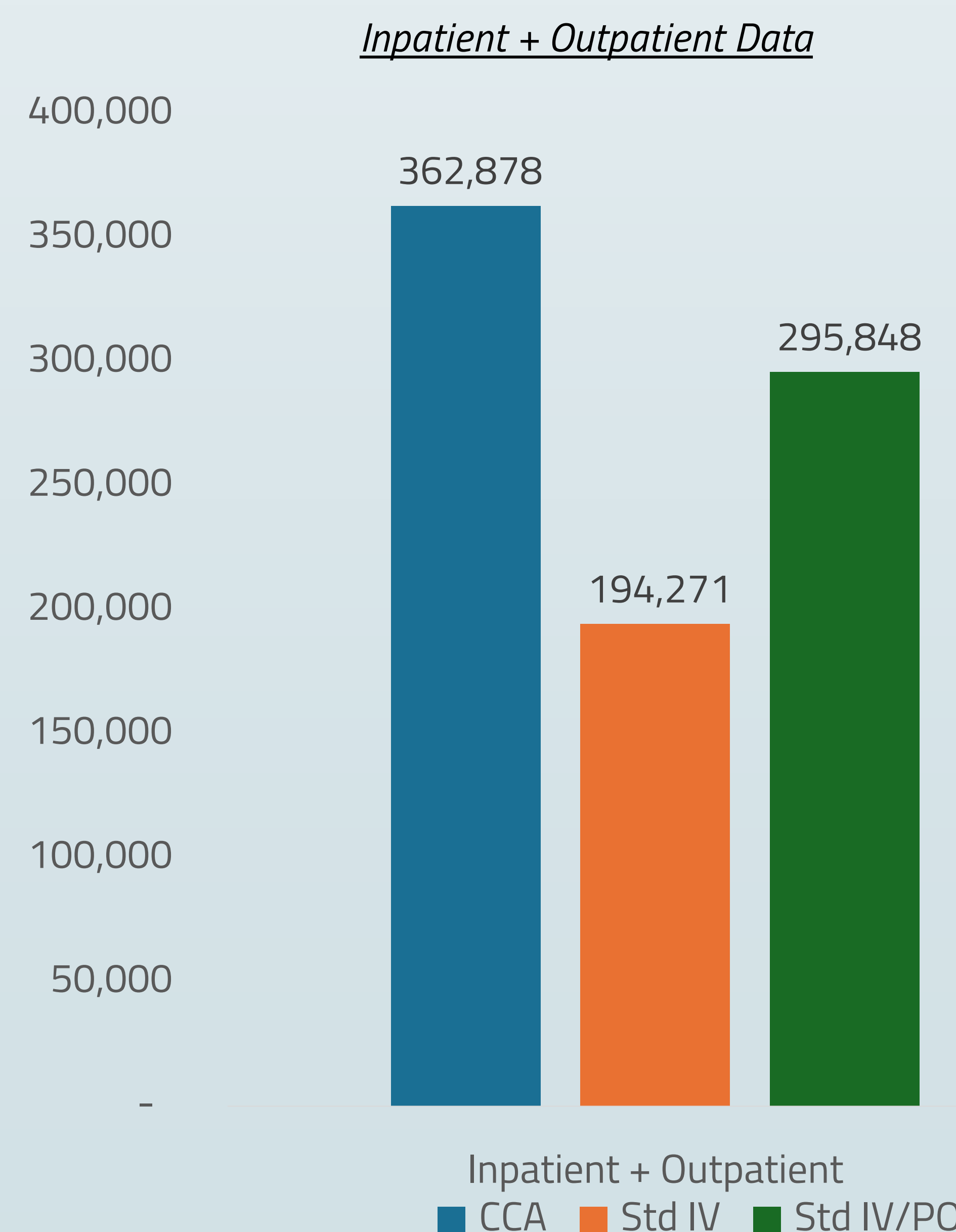
Economic and Time Impact of CCA Mesna Utilization: **Per-Cycle, Per-Patient, and Annual Estimates**[†]

	Standard IV* Median (IQR)	Standard IV/PO* Median (IQR)
Median cost savings of mesna per cycle, CAD	919 (777, 975)	296 (211, 381)
Median cost savings of mesna per patient, CAD	3,290 (1,698, 5,335)	1,187 (566, 2,009)
Total annual cost savings of mesna, CAD	168,607	67,029
Median additional chair time per cycle (outpatient only), hours	3 (3, 5)	-3 (-3, -6)
Median additional chair time per patient (outpatient only), hours	14 (6, 21)	-15 (-6, -21)
Median mesna and chair time cost savings per cycle (outpatient only), CAD	851 (805, 851)	364 (364, 432)
Median cost savings of mesna and chair time per patient (outpatient only), CAD	2,819 (1,102, 4,976)	1,426 (570, 2,340)
Total annual cost savings of mesna and chair time (outpatient only), CAD	96,441	68,716

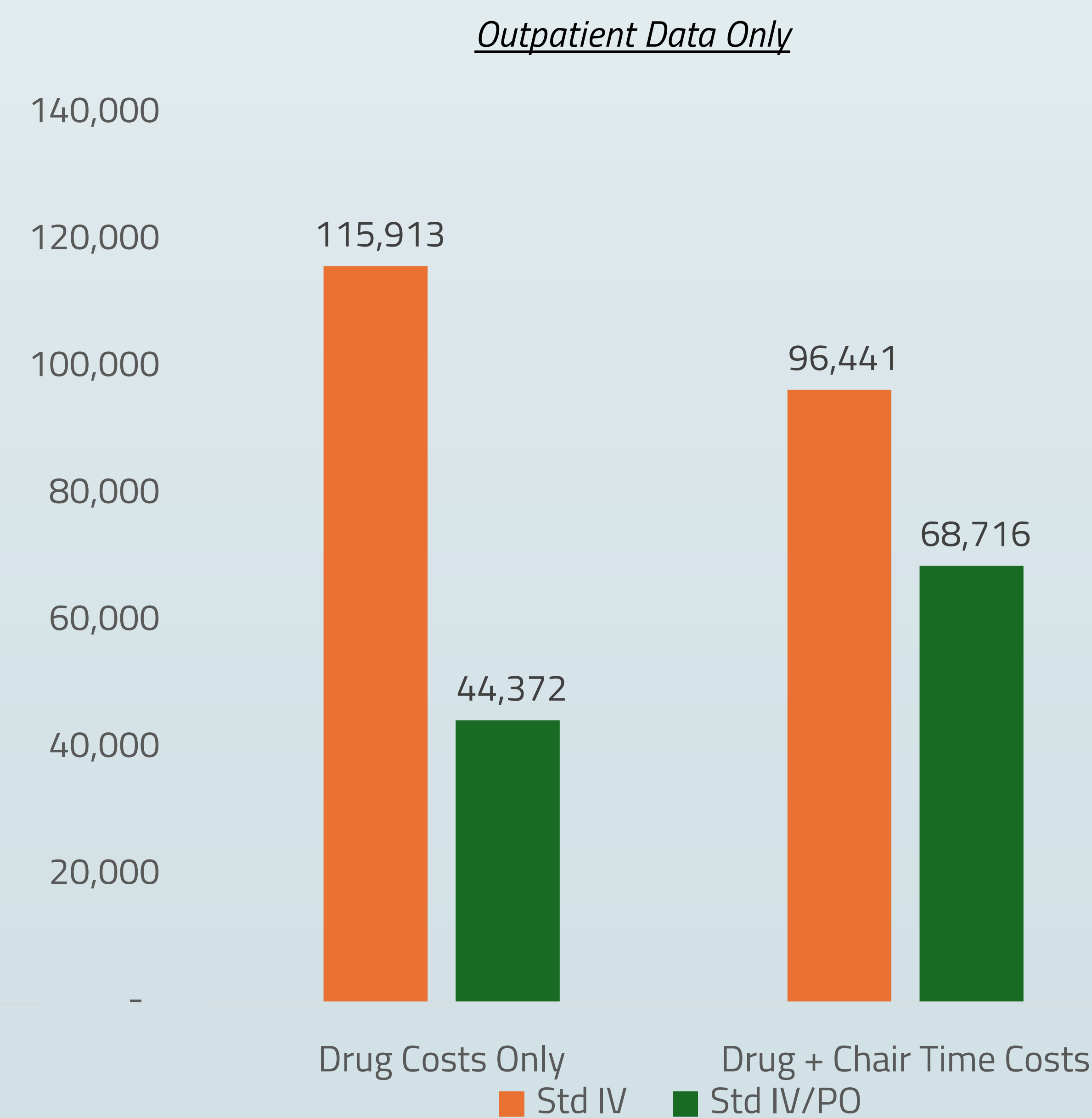
[†]All drug costs were calculated using Canadian list pricing for 400mg and 1000mg mesna ampules. Chair time was converted to cost using nursing wages, assuming a 3:1 chair-to-nurse ratio.

*In comparison to current IV CCA regimens.

Annual Mesna **Expenditure** Using Current CCA Regimens versus Standard Regimens (CAD)



Potential **Cost Savings** from Switching Current Regimens to Standard Regimens (CAD)



Discussion

Of 129 patients screened, 90 met inclusion criteria. Aligning current IV regimens with standard IV dosing yielded a median drug cost savings of \$3,290 per patient, corresponding to an annual projected savings of \$168,607 across CCA. However, this approach increased outpatient chair time by a median of 14 hours per patient, or a cumulative 878 hours for outpatients across CCA. In contrast, transitioning to standard IV/oral dosing resulted in a more modest cost savings of \$1,187 per patient and \$67,029 annually, but reduced chair time by a median of 15 hours per patient, or a total of 1,099 hours across all CCA outpatients. While standard IV dosing offers the greatest financial benefit, the IV/PO approach represents a more balanced strategy by achieving meaningful cost savings alongside reductions in chair time and treatment burden for patients.

Beyond these financial and operational considerations, reduced mesna utilization may also support broader system-level goals. Standardized dosing strategies have the potential to decrease medication waste and resource use in production and delivery, while also helping to mitigate drug shortages.

Conclusion

This retrospective chart review and cost-minimization analysis identified financial and operational inefficiencies, with no existing data showing clinically significant differences in outcomes between standard and higher-dose regimens. We highlight the importance of regularly revisiting institutional protocols to ensure alignment with best practices and cost-conscious care.

References

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