SAEM 2026 · CLINICAL OPERATIONS

Optimization of Pregnancy Testing in the University of Virginia Emergency Department

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−13.6 pp

DROP IN SERUM QUANTITATIVE HCG ORDERS WITHOUT APPROPRIATE INDICATION

42.3% → 28.6% · **p < 0.001**

+46.1 pp
SHIFT TO SERUM QUALITATIVE HCG
8.0% → 54.5% · p < 0.001

−14 min
POCT URINE ORDER-TO-RESULT TIME
92 → 78 min · p < 0.001

$63.71
PATIENT-FACING SAVINGS PER TEST
30.1% cost reduction

BACKGROUND

Frequent quant hCG without clear indication.

Internal quality-improvement data from the UVA Emergency Department identified frequent ordering of serum quantitative human chorionic gonadotropin (hCG) testing without clear indications for ectopic pregnancy or miscarriage.

Despite rapid bedside processing, point-of-care (POCT) urine testing had the longest order-to-result time, likely reflecting inefficiencies in urine collection.

Among the three test types, serum qualitative hCG was the most efficient and cost-effective

$85 · qualitative

$207 · POCT urine

$279 · serum quant

In response, staff education and modifications to electronic health record (EHR) order sets were implemented to promote serum qualitative hCG. This study evaluated the impact on ordering patterns, efficiency, and cost.

METHODS

Retrospective pre/post analysis with EHR + education intervention.

Design. Retrospective analysis of pregnancy tests in the UVA ED across two periods.

Pre-intervention period. July 1, 2024 – June 30, 2025 (n = 7,704 orders).

Post-intervention period. September 1 – November 30, 2025 (n = 2,473 orders).

Primary outcomes. Order-to-result time, cost, and appropriateness of serum quantitative hCG use, judged by primary chief complaint (abdominal pain, vaginal bleeding, miscarriage) and/or ultrasound use.

Cost data. UVA Health Master Price List.

RESULTS

Significant ordering shift, faster POCT, lower cost.

−13.6 pp	Inappropriate serum quant hCG *(42.3% → 28.6%, p < 0.001)*
+46.1 pp	Serum qualitative hCG *(8.0% → 54.5%, p < 0.001)*
−36.6 pp	POCT urine testing *(72.0% → 35.2%, p < 0.001)*
−9.6 pp	Serum quantitative hCG *(20.0% → 10.3%, p < 0.001)*
−14 min	POCT urine order-to-result *(92 → 78 min, p < 0.001)*
80 min	Serum hCG order-to-result *(unchanged across periods)*
−$63.71	Mean cost per test *(weighted: $211.64 → $147.93, 30.1% reduction)*

CONCLUSION

EHR order-set redesign and provider education shifted ordering toward the most efficient test.

The intervention drove a 13.6 percentage-point drop in inappropriate serum quantitative hCG ordering, a 46.1-point shift toward the more efficient serum qualitative hCG test, faster POCT urine results by 14 minutes, and a 30.1% reduction in mean cost per pregnancy test — without sacrificing diagnostic appropriateness for ectopic pregnancy or miscarriage.

ASK ME ABOUT

- EHR order-set design choices
- Provider education delivery
- Cost-weighting methodology
- Appropriateness criteria definition