CMSL Ambulatory Sensitive Condition Nudge
(pending)

Study Protocol with Statistical Analysis Plan

January 24, 2025

Study Protocol

Background and Objective

The project aims to evaluate a nurse-led intervention to reduce inappropriate emergency department (ED) use among adult patients seen at Geisinger's Community Medicine Service Line (CMSL) clinics. The intervention occurs immediately following an appointment where a patient receives a diagnosis of an ambulatory sensitive condition (ASC; i.e., a condition considered to be a risk factor for near-term ED use). The evaluation will compare eligible patients with an ASC who were randomly assigned to receive follow-up outreach from a nurse (who was automatically prompted via the Epic electronic health record system to initiate outreach) with those who were randomly assigned to receive standard care. Analyses will be intent-to-treat. The primary outcome is ED use in the week following the appointment.

Objectives

The study will evaluate an intervention aimed at reducing ED use following ASC diagnoses via nurse post-appointment calls. Analyses will assess whether ED use is lower in the patients receiving the intervention vs. those in the control arm.

Design

This study is a randomized controlled trial with two study arms. Patients will be randomized to have their nurses receive or not receive outreach via Epic (the night following their appointment).

Methods

At the end of an eligible patient's CMSL appointment, a patient will be assigned to one of the following study arms, based on which of several ranges of randomized numbers that patient was originally assigned in their electronic chart:

> **Current standard practice (control arm):** Patients will not be included in a nurse follow-up call list.
>
> **Nurse nudge:** Following their visit and ASC diagnosis, patients in this arm will be included on an automated list for a nurse follow-up call. Note that, although the nurses will be prompted to call, not all patients in this arm will receive a call.

Power Analysis

With 2,988 patients, we would have 80% power to detect a 1.2% absolute decrease in ED visits between the active arm and the control arm, with two-tailed alpha of .05, assuming a 2% baseline rate of subsequent ED visits within 7 days. The target effect size and baseline rate were taken from a similar intervention on a separate service line at Geisinger.

Project Status

The intervention began on 1/6/2025. No data have been extracted from the electronic health record.

Statistical Analysis Plan

Planned Analyses

Primary Outcome: *ED visit [Time Frame: within 7 days post-appointment]*

Question: Does outreach decrease ED visits?

Analysis (Confirmatory): We will test the hypothesis that automatic Epic notification decreases the likelihood patients will visit the ED in the 7 days following the day of their appointment. We will run an OLS regression including a categorical predictor variable coding for experimental arm (0 = control arm, 1 = outreach arm).

Other pre-specified outcome: *Nurse call to patient [Time frame: within 7 days post-appointment]*

Question: Does the nurse nudge increase post-appointment nurse calls to patients?

Analysis (Confirmatory): We will test the hypothesis that automatic Epic notification increases the likelihood that nurses will call patients in the 7 days following the day of their appointment. We will run an OLS regression including a categorical predictor variable coding for experimental arm (0 = control arm, 1 = outreach arm).

Analysis Notes

Recent work suggests that OLS regressions are appropriate in randomized experiments with binary outcome variables such as ours (Gomila, 2021).

Reference

Gomila, R. (2021). Logistic or linear? Estimating causal effects of experimental treatments on binary outcomes using regression analysis. *Journal of Experimental Psychology: General*, *150*(4), 700-709. https://doi.org/10.1037/xge0000920