Informing Low-acuity Emergency Department Patients of Non-emergent Healthcare Resources Following Discharge to Decrease Emergency Department Utilization Part 2

(NCT to be assigned)

Study Protocol with Statistical Analysis Plan

September 15, 2025

Study Protocol

Background

The goal of this campaign is to reduce unnecessary visits to a Geisinger emergency department (ED). In this campaign, patients will be assigned to receive or not receive outreach following ED discharge with a low-acuity visit designation. Outreach will occur via a text message the day after discharge from the ED as well as information added to the patient's after visit summary (AVS). Depending on the assigned condition, it will include calls to see their primary care provider (PCP) or use an Intelligent Triage tool. The study will assess whether ED use within the following 120 days differs across patients in different outreach conditions (current standard practice vs contact your PCP vs use Intelligent Triage). It will also examine whether patients follow through on the message-specific calls to action differently across conditions.

Objectives

The study will involve randomized assignment of patients to different versions of outreach. Intervention arms will either encourage patients in non-emergent situations to contact their primary care provider, or to use an Intelligent Triage tool to help determine the best venue for their care. The control arm will receive the current standard system AVS. Data will be analyzed to determine which version is most effective at reducing ED use.

Design

This study is a randomized controlled trial with three study arms. Patients will be randomized to one of the three conditions: (1) current standard practice (2) contact your PCP (3) use Intelligent Triage.

Methods

At the time of an eligible patient’s discharge from the ED, that 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:

1. **Current standard practice (control arm):** Patients in this arm will receive the current standard AVS and whatever typical system outreach occurs
2. **Contact your PCP (treatment arm):** Intervention content emphasizes contacting a primary care provider (content will vary slightly based on whether the patient has a Geisinger PCP)
3. **Use Intelligent Triage (treatment arm):** Intervention content emphasizes using Intelligent Triage to assess symptoms and decide on an appropriate venue for care

Power Analysis

With 8,286 patients (2,762 per arm), we would have 80% power to detect a 3.0% absolute decrease in ED visits between any two arms, with two-tailed alpha of .15, assuming a 41% baseline rate of subsequent ED visits within 120 days. The target effect size and number of patients are largely informed by practical considerations regarding the acceptable duration of the intervention (approximately 6 months), with an effect deemed useful if achieved.

Project Status

The intervention launched on April 15, 2025, but no data have been extracted from the electronic health record or analyzed as of the time this document was uploaded.

Statistical Analysis Plan

Planned Analyses

Primary Outcome: *ED visit [Time Frame: within 120 days following day of discharge]*

Question: Do the active treatment conditions decrease ED visits compared with standard care?

Analysis (Confirmatory): We will test the hypothesis that SMS text plus AVS outreach decreases the likelihood patients will visit the ED in the 120 days following day of discharge. We will run an OLS regression including a categorical predictor variable coding for experimental arm (0 = control arm, 1 = Contact your PCP, 2 = Use Intelligent Triage).

Question: Are messages encouraging patients to contact their PCP or encouraging the use of Intelligent Triage differently effective at decreasing ED use?

Analysis (Exploratory): We will test the hypothesis that SMS text plus AVS outreach is different in the Contact your PCP arm and Use Intelligent Triage arms. We will run an OLS regression including a categorical predictor variable coding for experimental arm (0 = Contact your PCP, 1 = Use Intelligent Triage).

Other Pre-specified Outcomes

We will run the analysis described above on the following additional outcomes:

1. PCP appointment made

   PCP appointment made (yes/no)

   [Time Frame: within 60 days following day of discharge]

2. PCP visit

   PCP appointment attended (yes/no)

   [Time Frame: within 60 days following day of discharge]

3. Telehealth appointment made

   Telehealth appointment made (yes/no)

   [Time Frame: within 60 days following day of discharge]

4. Telehealth appointment attended

   Telehealth appointment attended (yes/no)

   [Time Frame: within 60 days following day of discharge]

5. Urgent care visit

   Urgent care appointment attended (yes/no)

   [Time Frame: within 60 days following day of discharge]

6. Call made to PCP

   Record of patient call to PCP (yes/no)

   [Time Frame: within 60 days following day of discharge]

7. Used Intelligent Triage tool

   Used Intelligent Triage tool (yes/no)

   [Time Frame: within 60 days following day of discharge]

8. Any of the suggested actions taken

   PCP called or visited, urgent care visited, telehealth appointment attended, or PCP or telehealth appointment scheduled, or used Intelligent Triage (yes/no)

   [Time Frame: within 60 days following day of discharge]

Analysis Notes

Recent work suggests that OLS regressions are appropriate in randomized experiments with binary outcome variables such as ours (Gomila, 2021). We will report heterogeneity-robust standard errors.

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