

# Improving Notification of Sexually Transmitted Infections: A Quality Improvement Project and Planned Experiment.



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## Background:

The prevalence of STIs in the CCHMC ED is high: About 25% of women ages 14-21 who are tested are positive for at least one treatable STI (chlamydia, gonorrhea, or trichomoniasis).

Because follow up of teens is difficult, overtreatment is common.

The policy had been: if a teen was positive for an STI, but had been empirically treated in the ED, she was not notified of her infection status.

**The Gap:** Inadequate follow-up of positive sexually transmitted infection (STI) test results is a gap in health care quality that contributes to the epidemic of STIs in adolescent women.

**Objective:** To improve our ability to contact adolescent women with a positive STI test result following an ED visit.

## Methods

**Design:** This was an Interventional quality improvement project:

Phase 1: Plan-Do-Study-Act cycles to test interventions such as provider education and system changes.

Phase 2: Planned experiment studying 2 interventions (study cell phone and patient activation card) using a 2 x 2 factorial design with one background variable and two replications.

**Setting:** An urban pediatric ED

## Outcomes:

The % of women ages 14-21 with STI testing whose confidential phone number was documented in the electronic medical record (EMR)

The % of STI-positive women successfully contacted within 7 days or lost to follow-up (not contacted within 30 days).

**Analyses** utilized standard QI Shewhart control charts and graphical displays.

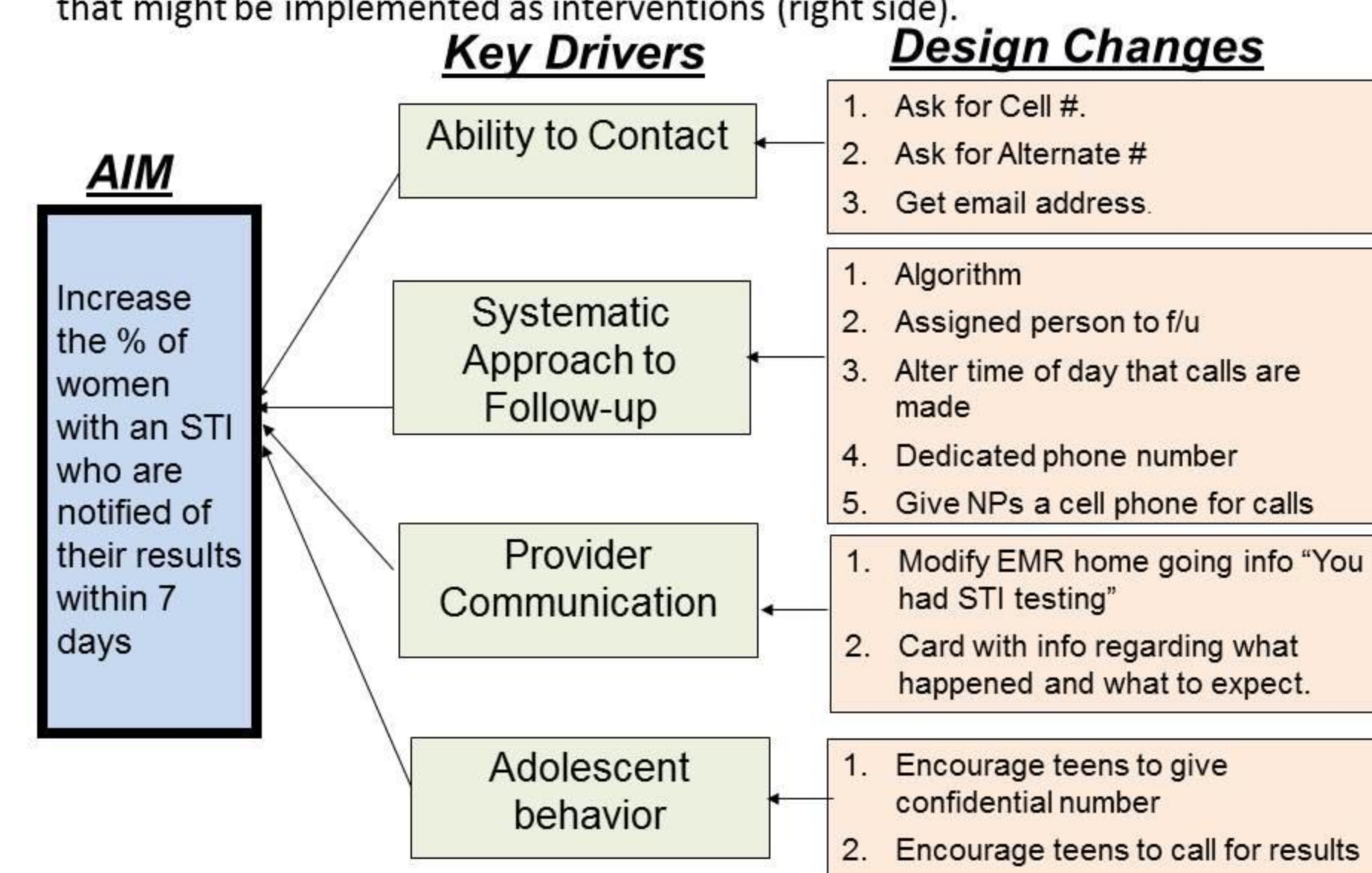
## Results

Phase 1 interventions increased the proportion of records with a confidential phone number from 25% to 58%. Simultaneously, the proportion successfully contacted increased from 45% to 65%, and loss to follow-up decreased from 40% to 24%.

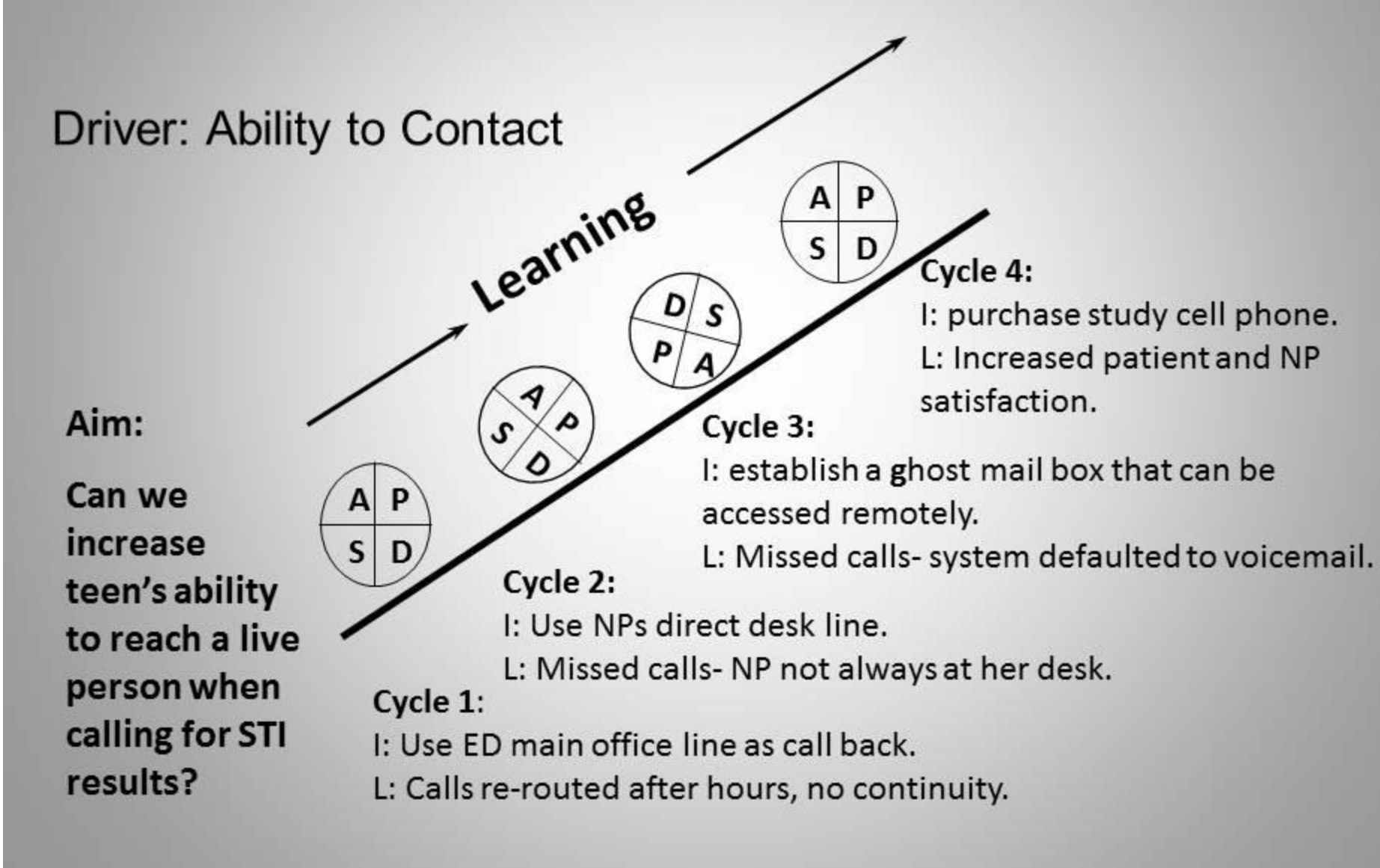
In phase 2, there was an interaction between replications and successful contact that coincided with a change in EMR systems and decreased recording of the confidential phone number. In addition to the confidential number, two interventions improved contact success: giving a patient activation card and using a designated cell phone for follow-up calls. These interventions had a synergistic effect on successful contact, especially when confidential numbers were less reliably documented.

## Phase 1

**Figure 1.** Key driver diagram: This QI tool starts by identifying our aim (left side of the diagram). We use qualitative interviews and clinical experience to identify the key drivers (center) that affect this aim. Then, we brainstormed design changes that might be implemented as interventions (right side).



**Figure 2:** Learning from Plan-Do-Study-Act (PDSA) Cycles to increase our ability to make voice-to-voice contact with adolescent women who have a positive STI result. NP= nurse practitioner, I= intervention, L= learning.



**Figure 3:** Patient activation card. Intervention: cards distributed to all adolescent women with STI testing at their ED visit. During the planned experiment, the active version included all text, and the inactive version excluded the italicized text between the asterisks.

**Our goal is to keep you healthy!**

You had tests performed on \_\_\_/\_\_\_/\_\_\_

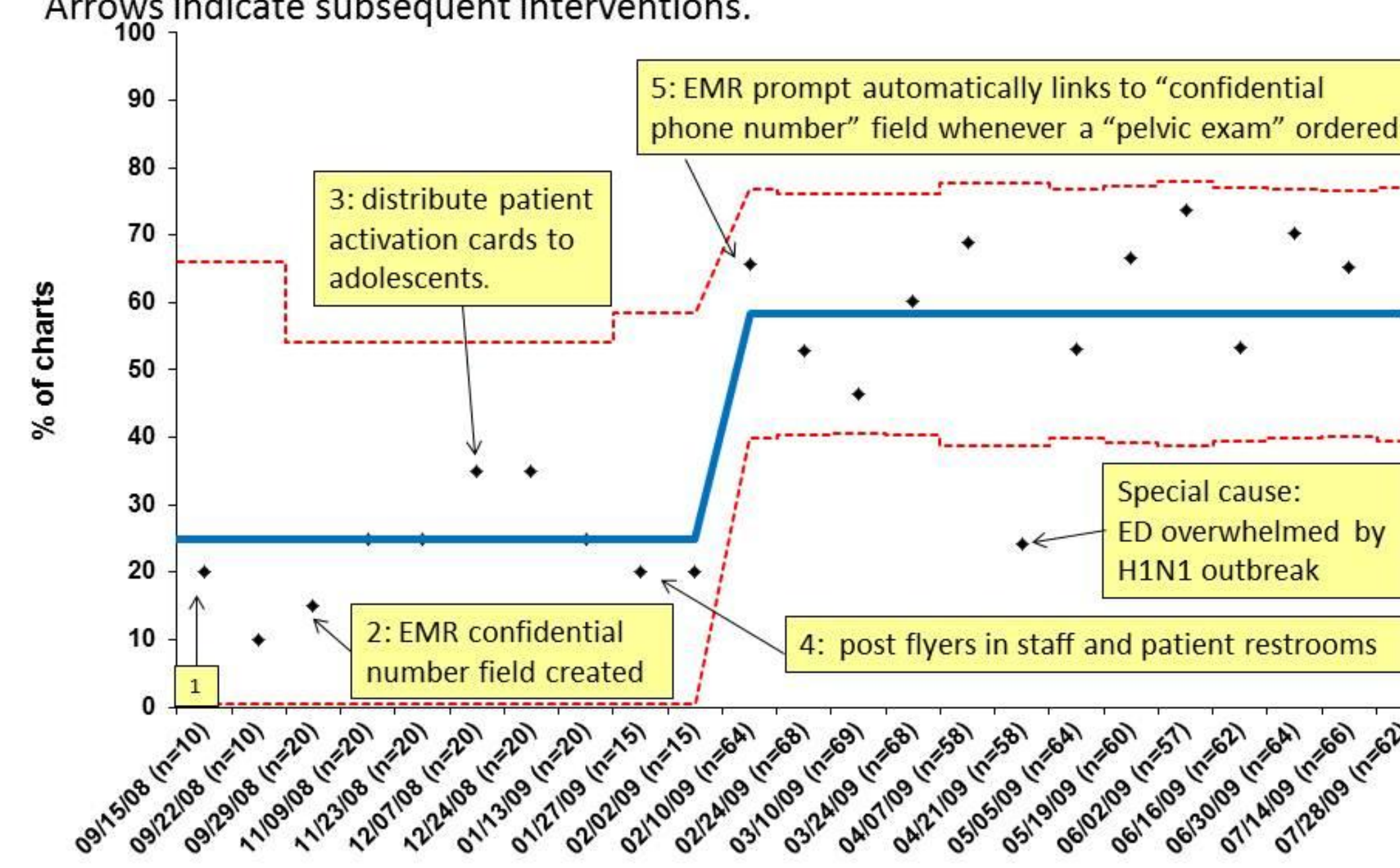
Your results should be back in about 3-4 days

Tell your doctor or nurse today what number we should call to reach you. We will contact you in a few days if your results are positive

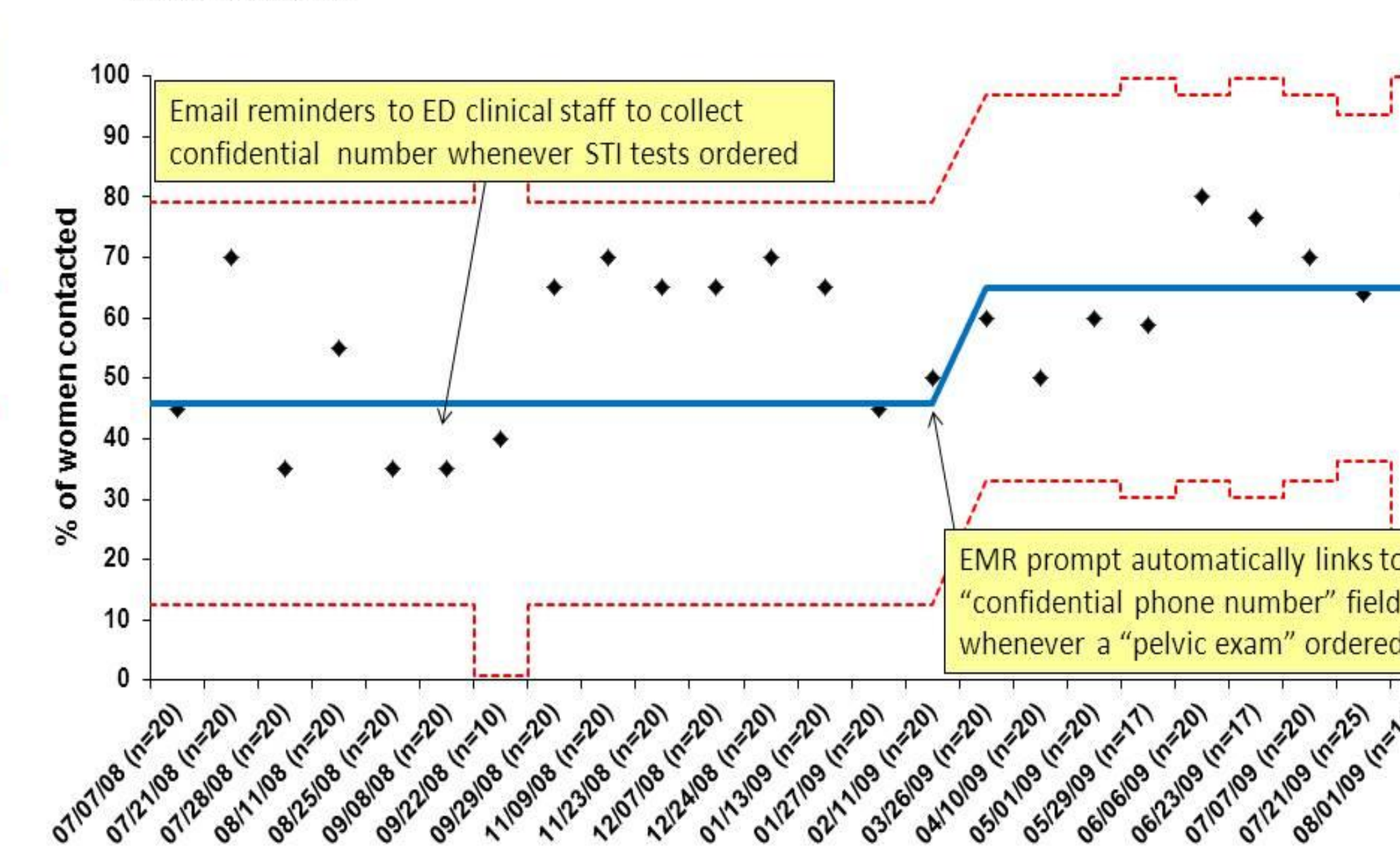
*\*You may also call Rachael at 513-xxx-xxxx to get your test results. Please call between 9 AM and 5 PM\**

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**Figure 4.** Shewhart P-Chart: Percent of charts with confidential number documented in the EMR for women with STI testing, over time. n= number of charts/ interval. Solid line: mean percentage. Dotted lines: control limits. Initial intervention (Box 1): Email ED staff reminders to collect confidential number whenever STI tests ordered. Arrows indicate subsequent interventions.



**Figure 5.** Shewhart P-Chart: Percent of women with an STI who were successfully contacted within 7 days of their ED visit, over time. n= number of infected women/ interval. The vertical axis is the percent of women contacted. Solid line: mean percentage. Dotted lines: control limits. Arrows indicate interventions.

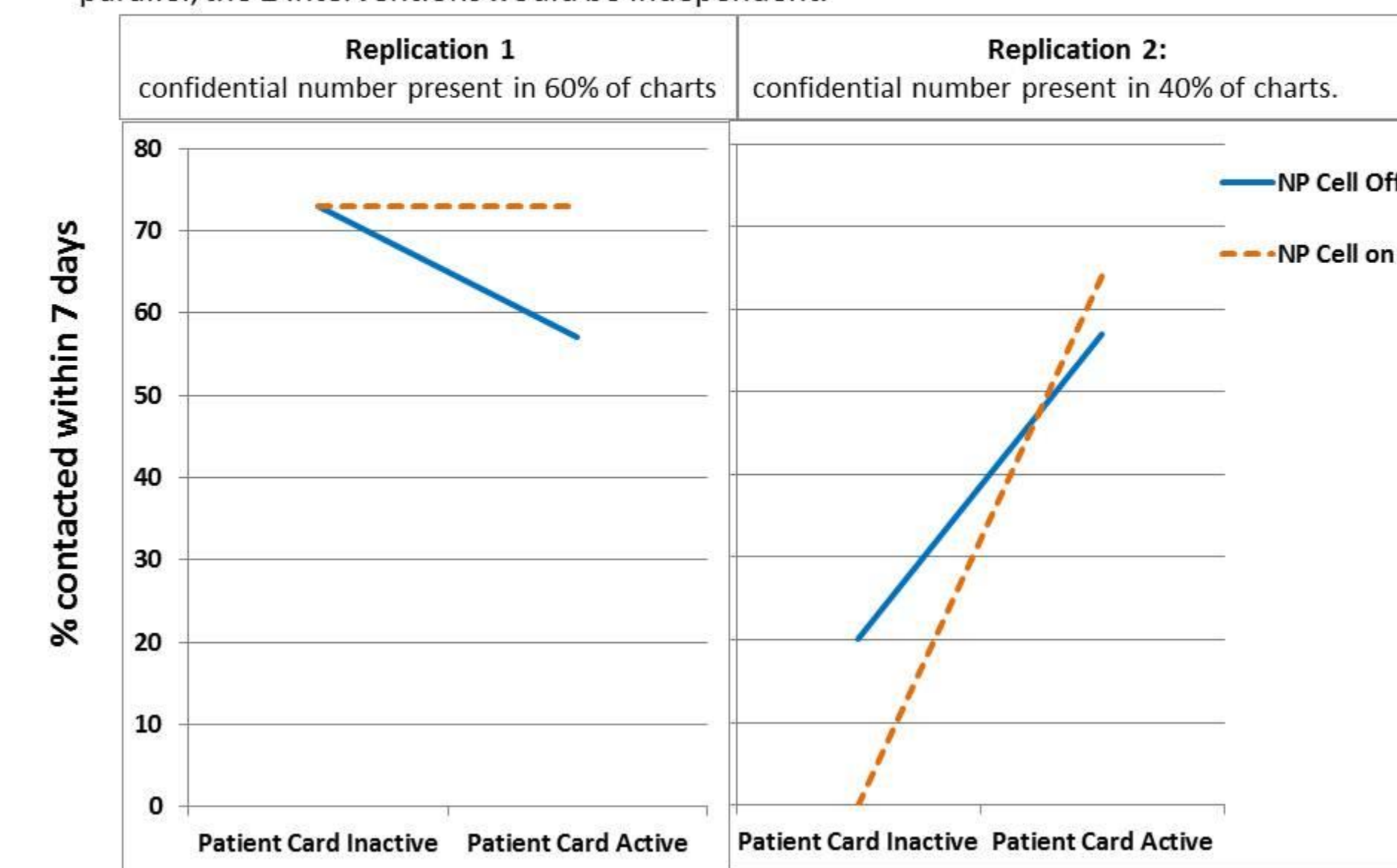


**Figure 6.** Design Matrix for a 2<sup>2</sup> factorial planned experiment denoting the order of runs and replications. The 2 modifiable factors (patient card and Nurse Practitioner (NP) cell phone) each has two levels, resulting in 4 combinations or "runs." The experiment was replicated, reversing the runs, after a change in electronic medical record (EMR) system.

Replication	Run	Factor	
		NP Cell	Patient Card
One	A	On	Active
	B	On	Inactive
	C	Off	Inactive
	D	Off	Active
Break for EMR system change			
Two	D	Off	Active
	C	Off	Inactive
	B	On	Inactive
	A	On	Active

## Phase 2

**Figure 7.** Response plots of the outcome (% of infected women contacted within 7 days) for the planned experiment, by replication and background variable (confidential number). Each point is the mean result for the four conditions of the experiment. If the lines were parallel, the 2 interventions would be independent.



## Conclusion:

Low-cost, system level interventions are feasible and sustainable in a busy ED, and work together to improve our ability to contact adolescent women with their STI results in a timely fashion.

## Implications for Programs, Policy, and Research:

Post-visit interventions may decrease the risk of reinfection and disrupt STI transmission.