Improving Hypertension Outcomes through Chart Review with Clinician Learners

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Introduction

- Hypertension is the most common modifiable risk factor for cardiovascular disease, yet guideline-based management remains inconsistently applied in primary care.
- In 2024, BP control rates at FQHCs reached **67%**, below the **CDC's Million Hearts 80% target**.
- Provider-focused strategies such as audit and feedback are recommended to address these gaps.
- Teaching settings offer a critical opportunity to embed peer-led chart review as a scalable quality improvement and educational strategy.

Objective

To evaluate whether a clinician peer chart review intervention improves blood pressure control and improves clinician performance over time.

Methods

- **Design:** The chart review tool evaluated documentation of key evidence-based management strategies (see figure 1).
- **Implementation:** Family Medicine (FM) Residents at Long Island City (LIC) and Nurse Practitioner (NP) Fellows at Washington Heights (WH) completed 5 chart reviews each for patients with a documented diagnosis of hypertension (55 charts total)
- **Time Investment:** The 5 charts took an average 30 minutes to review.

Figure 1. Key Elements of Chart Review Tool

Diagnosis & Risk Factors
- Secondary hypertension work-up
- Alcohol or tobacco use

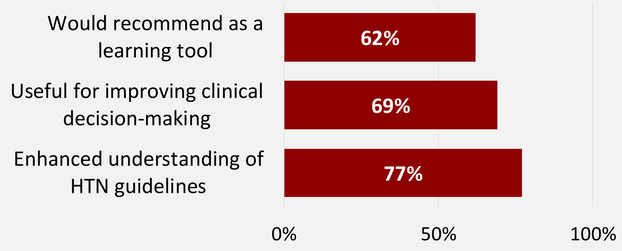
Goals & Monitoring
- Identifying blood pressure goals
- Home blood pressure monitoring
- Timely follow-up visits until controlled

Treatment Plan
- Medication reconciliation
- Evidence-based prescribing practices
- Evaluation of treatment inertia

Clinician Qualitative Feedback on the Chart Review Process

Clinician feedback was collected via a brief survey assessing the perceived educational value of the intervention.

Figure 2. Clinician Learner Feedback Survey Results

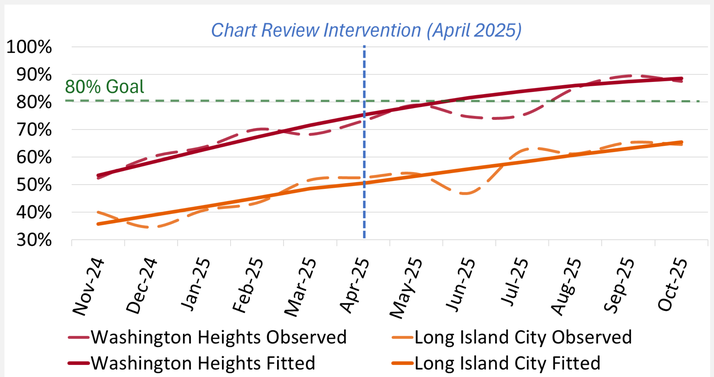


Providers highlighted the following as the **most valuable aspects** of the process.
- Improved awareness of documentation gaps
- Reinforcement of evidence-based guidelines
- Recognition of areas for improvement in their own practice

Process Measure

Figure 3. Timely Follow-Up for Uncontrolled Hypertension Over Time with Segmented Regression

Control defined as a BP reading >140/90 mm/Hg. Timely follow-up is defined as scheduled 2-3 weeks after BP reading.

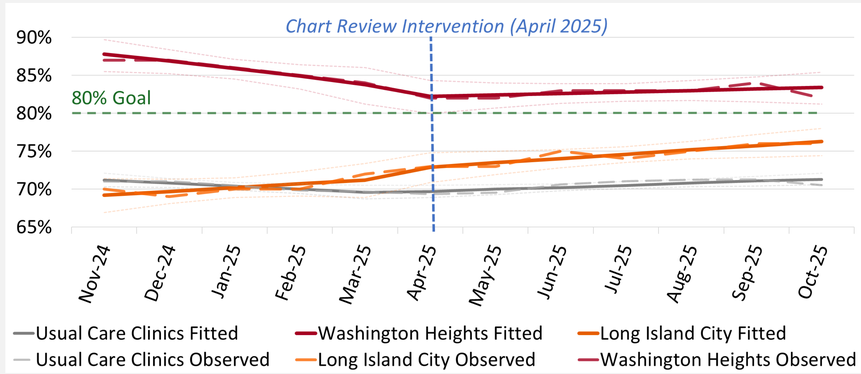


** Solid lines represent segmented regression estimates and dashed lines represent observed values.*

- At Washington Heights, timely follow-up increased significantly prior to the intervention (OR 1.20 per month, p = 0.003), with no significant immediate change (OR 0.89, p = 0.63) or change in trend following the intervention (OR 0.97, p = 0.66).
- Similarly, at Long Island City, timely follow-up improved prior to the intervention (OR 1.14 per month, p = 0.007), with no significant change at the time of intervention (OR 0.95, p = 0.79) or post-intervention trend (OR 0.97, p = 0.62).
- These findings suggest that **observed improvements reflect pre-existing trends rather than an intervention-associated effect**.

Outcome Measure

Figure 4. Blood Pressure Control Over Time: Segmented Regression with Chart Review Intervention



** Solid lines represent segmented regression estimates; dashed lines represent observed rates and 95% confidence intervals.*

- Across clinics providing usual care, blood pressure control declined prior to the intervention (OR 0.98 per month, p = 0.037) but improved afterward (OR 1.03 per month, p = 0.002), indicating a small but statistically-significant system-wide trend.
- Washington Heights demonstrated higher baseline control compared with the system (OR 3.10, p < 0.001) and a greater post-intervention improvement relative to system trends (OR 1.07, p = 0.16, this improvement, however, was not statistically significant).
- In contrast, Long Island City demonstrated a **steady increase over time without a significant change associated with the intervention** (post-intervention trend vs system: OR 0.97, p = 0.37).
- These findings suggest that **the intervention may have contributed to reversal of a declining trajectory at Washington Heights**, while changes at other sites more likely reflect underlying secular trends.

Independent Reviewer Assessment of Behavior Change

Table 1. Chart Review Tool Composite Scores from Independent Reviewers

	Pre- Intervention Average	Post- Intervention Average
NP Fellows (n= 5)	73%	72%
Residents (n=6)	71%	67%

Independent review scores highlighted that no clearly meaningful improvement of documentation occurred pre- vs post-intervention. There was a small signal that BP goal documentation improved in both offices.

Data Analysis Considerations

- Our evaluation focused on population-level blood pressure control at the office, under the assumption that the chart review intervention affected faculty and residents.
- Fellows who received the intervention left the site 5 months after the chart review period. We then saw a drop in control with the new group of clinicians.
- A quasi-experimental interrupted time series design using segmented regression with a system comparator was used to distinguish intervention effects from secular trends.

Conclusion

- While blood pressure control improved in both offices, we were unable to definitively impute impact of the chart review on this outcome.
- At our Washington Heights location, the intervention was associated with reversal of a declining blood pressure control trend.
- Learners, in general, found the exercise meaningful as an educational tool.
- Concurrent system-wide improvement tells us that other QI interventions likely influenced improvement at all sites, such as three-week follow-up scheduling for patients with a BP reading >140/90 mm/Hg.

Next Steps (Adapt)

- **Structured feedback sessions** may help to ensure that the learner is implementing the feedback from the chart review.
- We intend to re-implement this intervention with more **granular evaluation** of other process metrics.
- Future studies will evaluate whether this intervention is more successful in sites **not involved in medical education**, and if so, whether it is financially sustainable.