

Improving the Detection of Hypertension in Pediatric Ambulatory Visits

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Abstract

- Pediatric hypertension (HTN) often goes undetected in the ambulatory setting.
- This study is designed to improve the detection of hypertension in children.
- We reviewed the charts of 1697 children and determined whether HTN was recognized in the children with elevated blood pressures (BP).
- We completed five educational interventions after collecting baseline data.
- We found that our interventions improved the detection of HTN.
- Our interventions correlated with a decrease in the prevalence of HTN, probably related to a decrease in patient anxiety with repeat measurements and education about correct cuff sizing.
- Obesity, systolic BP ≥ 120 mmHg, and past history of elevated BP were factors that increased the detection of HTN.

Introduction

- The prevalence of pediatric hypertension has increased in the past several decades and is projected to continue to rise.²
- Because normal blood pressure values in children are reported in percentiles and depend on age, sex, and height, HTN is difficult to recognize.
- If not diagnosed during childhood, HTN poses several long-term health risks.³
- Electronic medical records (EMR) have tools to help recognize elevated BP in children. Unfortunately, many clinicians are unaware of these support tools, and pediatric HTN is underdiagnosed.

Methods

- This is a prospective quality improvement study completed at a teaching institution with rotating physicians.
- We reviewed the charts of 1697 children aged 3 to 18 years who were seen by physicians for well-child visits in March, June, July, August, November 2014, and January 2015.
- We recorded children with elevated BP and determined if HTN was recognized (noted in the assessment/plan or BP repeated).
- We used March as our baseline detection rate.
- We completed five interventions.
- All interventions consisted of PowerPoint presentations for medical personnel before each month following March. The last two interventions consisted of a change in the EMR (BP percentiles displayed in SnapShot) and signs hung in the clinic.
- Pre- and post-intervention data underwent analysis, and we examined factors that may impact early detection of HTN.

Results:

- Of the 1697 children, 188 (11.1%) had elevated BP.
- The prevalence of elevated BP declined from the pre-intervention month to post-intervention months (March 13.5%, June 10.3%, July 9.7%, August 9.2%, November 12.5%). The prevalence returned to baseline by January (13.5%), as shown in Figure 1.
- The recognition of elevated BP improved from 25% in March to 44% and 55% in June and July, respectively. There was a decline in detection from July to August and November (55% to 41% and 35%), but improved detection from November to January (35% to 48%), as shown in Figure 2.
- Factors that increased the detection of HTN were obesity ($\chi^2=22.9$, $p=0.000002$), systolic BP ≥ 120 ($\chi^2=8.1$, $p=0.0045$), and a past history of elevated BP ($\chi^2=5.1$, $p=0.024$).

Cycle	Intervention	Well Child Checks (#)	Prevalence of Elevated Blood Pressures	Detection of Elevated Blood Pressures
Baseline (March)	---	267	13.5%	25%
Cycle 1 (June)	Education: General Clinic, Nurses	262	10.3%	44%
Cycle 2 (July)	Education: General Clinic, Continuity Clinic, Nurses	454	9.7%	55%
Cycle 3 (August)	Education: General Clinic	315	9.2%	41%
Cycle 4 (November)	Education: General Clinic EMR Change	184	12.5%	35%
Cycle 5 (January)	Education: General Clinic EMR Change Clinic Signs	215	13.5%	48%

Prevalence of Elevated Blood Pressure

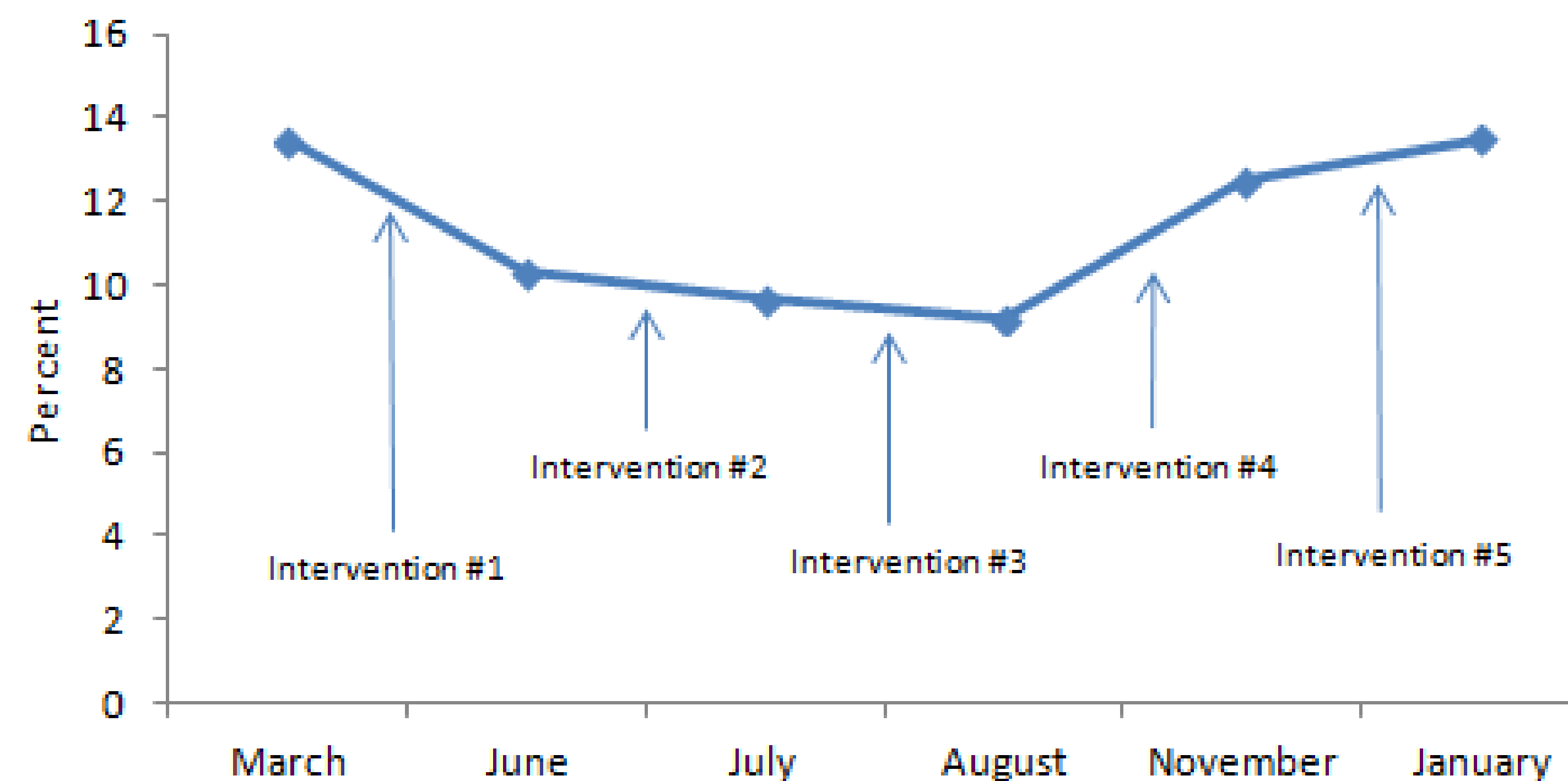


Figure 1. The prevalence of hypertension was not statistically different between the five sampling periods.

Detection of Elevated Blood Pressure

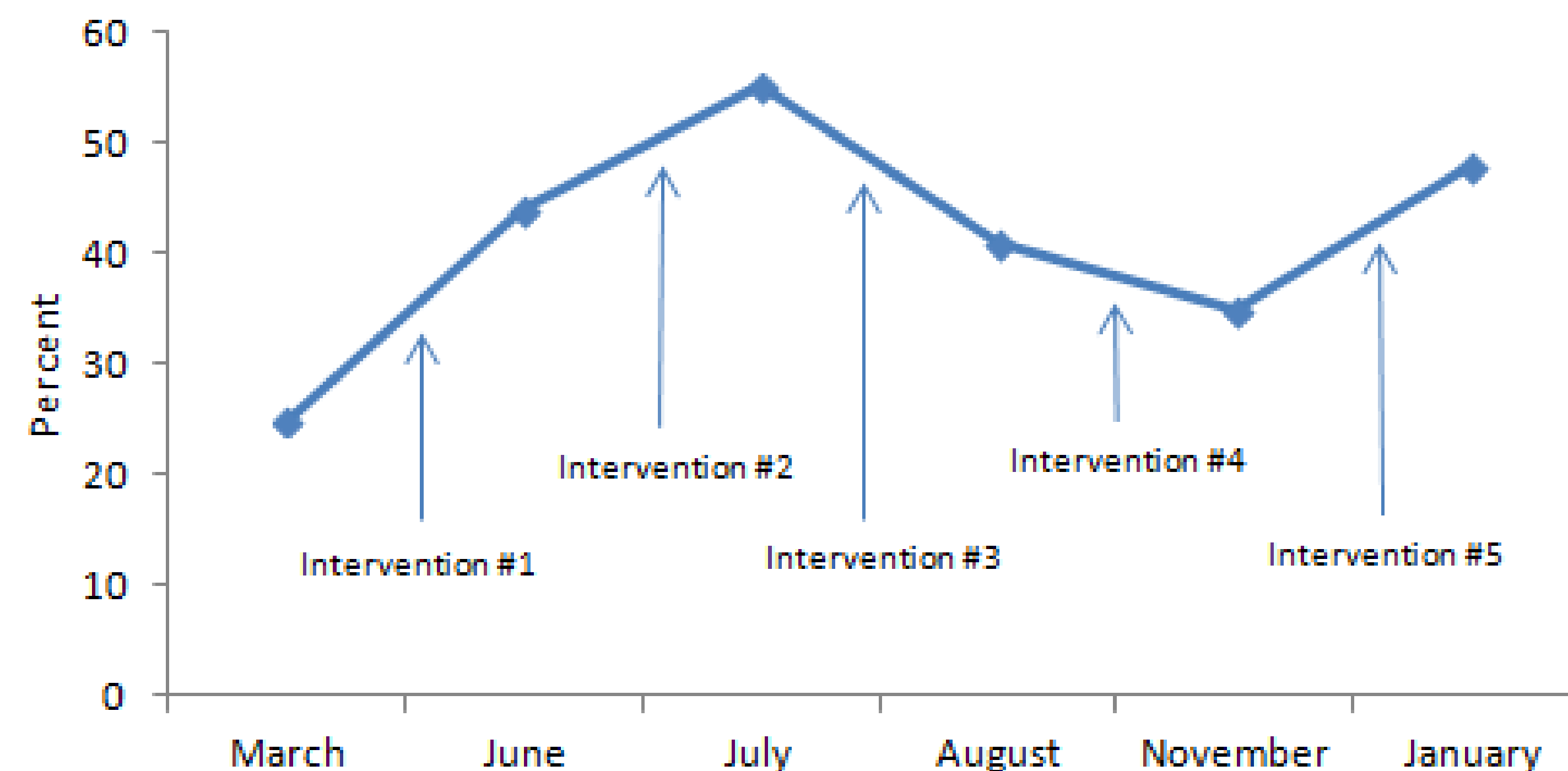


Figure 2. Detection of hypertension in periods two through five was statistically above the baseline rate in period one.

Discussion

- Pediatric hypertension is a prevalent, asymptomatic condition that should be diagnosed early.
- Simple interventions, like education about the importance of early diagnosis, electronic medical record tools, and blood pressure cuff sizing and placement can improve the overall recognition of elevated blood pressures in pediatric populations.
- Our study demonstrates the importance of whole clinic and repeated educational interventions.

Conclusions

- Our educational interventions improved the absolute detection of HTN.
- Repetition of interventions and involvement of the whole care team were important for sustaining the improvements, especially for a teaching institution with rotating physicians. Repeated interventions may not be necessary for private practice clinics.
- A change in the EMR was associated with a decline in improvement, but an EMR change plus clinic signs improved the detection.
- The improved detection correlated with a decline in the prevalence of HTN, probably related to blood pressures that were falsely elevated due to patient anxiety and incorrect cuff sizing.
- Obesity, systolic BP ≥ 120 , and past history of at least one elevated BP significantly improved the detection. Our interventions helped recognize high risk patients.
- This QI project was not intended to determine the efficacy of each intervention, but rather to improve the detection rate as a whole. We cannot conclude whether the monthly changes were due to chance, but we can conclude that we improved the overall detection. We will continue to educate the clinic as a whole about the importance of HTN in children.

References

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