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Short communication

Detection and disposition of patients with elevated BP in subspecialty clinic

Abstract

Hypertension affects 2% to 5% of children and adolescents, yet up to 75% of cases go unrecognized in primary care settings. To address this gap, we implemented a quality improvement initiative at St. Joseph's Children's Hospital aimed at enhancing the identification and management of elevated blood pressure (BP) in four pediatric subspecialty clinics: Neurology, Gastroenterology, Endocrinology, and Pulmonology. Using serial Plan-Do-Study-Act (PDSA) cycles, we introduced targeted interventions including standardized BP measurement by trained medical assistants, physician alerts, and communication with primary care providers (PMDs). Among 200 patients reviewed in the first three cycles, BP documentation improved from 77.5% to 100%, and physician acknowledgment of elevated BP rose from 0% to 23.8%. In the final cycle, follow-up calls confirmed that 51.1% of patients with elevated BP were evaluated by their PMDs, resulting in lifestyle counseling or referrals to pediatric cardiology and nephrology. These findings highlight the effectiveness of structured workflows and inter-provider communication in improving pediatric hypertension recognition and follow-up in subspecialty settings.

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Introduction

Hypertension, one of the top five chronic diseases in children and adolescents, occurs in 2% to 5% of all pediatric patients. Yet, the diagnosis of pediatric hypertension (HTN) is missed in up to 75% of pediatric patients in primary care settings.[1–4] This prompted us to improve identifying patients with elevated blood pressure in our subspecialty clinics.

Aim statement

Following diagnostic criteria set forth by the 2017 AAP's Pediatric Hypertension Practice Guidelines (4), this project aims to identify and address deficiencies in measuring, documenting, and interpreting blood pressure (BP) and addressing patients with an elevated BP reading with appropriate measures at multi-specialty pediatric ambulatory care center at St. Joseph's Children's Hospital.

Methods

Utilizing the Quality Improvement (QI) and serial PDSA method (Plan-Do-Study-Act) to test changes, which we predicted would improve to identify and address patients with elevated BP. We focused our QI in 4 pediatric subspecialty ambulatory clinics: Neurology, GI, Endocrinology, and Pulmonology. Subjects were patients aged seven years and above. Patients with established hypertension were excluded.

(i) **Baseline pre-study:** Data were collected to ascertain the rate of patients with uncharted BP and patients with charted elevated BP not addressed.

(ii) **First cycle:** Trained medical assistants identified and documented patients with elevated BP as defined by the APA guidelines after measuring BP twice and using appropriate measuring techniques.

(iii) **Second cycle:** Medical assistants alerted physicians seeing patients with elevated BP by placing a sticky note on the examination room doors.

(iv) **Third cycle:** Medical assistants notified primary care doctors of patients with elevated BP by fax letter.

(v) **Fourth cycle:** We contacted PMD offices to inquire whether they had received the fax letter and if any action was taken. (Figure 1)

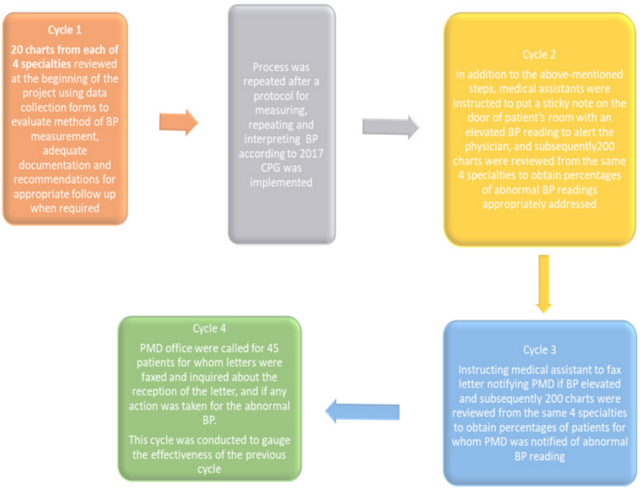

Figure 1 Sequential PDSA cycles to improve blood pressure measurement, documentation, and follow-up in pediatric subspecialty clinics.

(PDSA: Plan, Do, Study, Act).

Results

The review included 200 patient records for the first three cycles and 45 for the 4th cycle.(Table 1)

(i) **Baseline and first cycle:** BP readings were not documented in 18 out of 80 patients. Among 62 patients with abnormal screening, 29 patients had BP >90th percentile. None of the patients with elevated BP was acknowledged by the physicians.

(ii) **Second PDSA:** All 200 patients had their BP documentation by medical assistants. 63 had elevated BP. Physicians addressed the elevated BP in 15 patients.

(iii) **Third cycle:** 21 of 200 patients had BP > 90th percentile. Physicians addressed elevated BP in 5 patients. All patients with elevated BP generated notifications to their PMDs via fax implemented by the medical assistants.

(iv) **Fourth cycle:** 45 patients with elevated BP were tracked by calls to their PMDs. 25 acknowledged having received the notification fax letter. 23 patients were evaluated by the PMDs. Twelve patients showed normal BP. 4 patients were advised to do lifestyle modifications. 2 were referred to pediatric cardiologists. 8 were referred to pediatric nephrologists.

Table 1 Summary of results from four sequential PDSA cycles showing changes in blood pressure documentation, identification of elevated BP, physician acknowledgment, and follow-up actions

Results	PDSA 1	BP readings were not documented in 18 out of 80 patients. Among 62 patients with abnormal screening, 29 patients had BP >90th percentile. None of the patients with elevated BP was acknowledged by the physicians.
	PDSA 2	All 200 patients had their BP documentation by medical assistants. 63 had elevated BP. Physicians addressed the elevated BP in 15 patients.
	PDSA 3	21 of 200 patients had BP > 90th percentile. Physicians addressed elevated BP in 5 patients. All patients with elevated BP generated notifications to their PMDs via fax implemented by the medical assistants.
	PDSA 4	45 patients with elevated BP were tracked by calls to their PMDs. 25 acknowledged having received the notification fax letter. 23 patients were evaluated by the PMDs. Twelve patients showed normal BP. 4 patients were advised to do lifestyle modifications. 2 were referred to pediatric cardiologists. 8 were referred to pediatric nephrologists.

(BP: blood pressure; PDSA: Plan, do, study act; PMDs: primary care providers)

Discussion

This quality improvement initiative demonstrated that structured interventions can significantly enhance the recognition and follow-up of elevated blood pressure in pediatric subspecialty clinics. Initial data revealed a high rate of undocumented BP readings and a lack of physician response to abnormal values. Through targeted PDSA cycles—including standardized BP measurement, physician alerts, and communication with primary care providers—documentation rates improved, and physician acknowledgment of elevated BP increased modestly. This project showed that trained medical assistants requested to take BP in children resulted in the documentation of BP readings in 100% of the children. Flagging elevated BP using current guidelines criteria and notifying pediatric subspecialty physicians improved acknowledgment of the elevated BP readings in only a little less than 25% of the patients. Medical assistants' implementing direct notification by letter of the primary care doctors caring for the children noted to have elevated BP in the subspecialty clinic led to further improvement of detection and disposition: Over 50% of primary care doctors acknowledged having received the notification, and 50% of the 45 patients with elevated BP received appropriate evaluations.

Importantly, the final cycle showed that over half of the patients with elevated BP received follow-up care, with several referred for subspecialty evaluation. These findings underscore the importance of workflow optimization and inter-provider communication in closing diagnostic gaps and promoting timely management of pediatric hypertension.

Conclusion

We showed that adhering to current BP guidelines to detect children with elevated BP, empowering trained medical assistants to flag abnormal BP readings, and involving patients' primary care doctors to address their patients' elevated BP by direct letter notification improved the rate of children needing evaluations. Developing novel yet simple procedures like this one may help to further increase the identification and evaluation of children with abnormal BP seen in subspecialty clinics in the future.

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Conflict of interest

All the authors have no conflicts of interest to disclose.

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