

Improving primary care follow-up for gynecologic patients with hypertension: an implementation science pilot study

OBJECTIVE: Hypertension is the leading modifiable risk factor for cardiovascular disease (CVD), the leading cause of death in women.¹ Timely referral to primary care from specialty clinics for hypertension occurs infrequently, even among gynecologists.² BP Connect, a staff protocol for specialty clinics, doubled the odds of timely primary care follow-up for rheumatology patients with hypertension (42% after BP Connect implementation vs 29% before BP Connect implementation).³ Here, we sought to evaluate the feasibility and impact of implementing BP Connect in gynecology clinics.

STUDY DESIGN: In 2 academic gynecology clinics, the BP Connect intervention trained medical assistants and nurses to “check” (remeasure) blood pressure (BP) of $\geq 140/90$, “advise” patients of links between hypertension and CVD, and “connect” patients with confirmed high BP for timely primary care follow-up. The implementation included (1) tailored staff engagement focus groups, (2) staff education defining hypertension ($\geq 140/90$) and CVD risk, (3) electronic health record alerts prompting staff to remeasure elevated BPs and order timely follow-up (≤ 4 weeks) for confirmed high BP, (4) staff feedback (monthly audits), and (5) patient education and tools (brochure and BP log).⁴ The BP Connect implementation toolkit can be accessed at <http://www.hipxchange.org/BPConnect>.⁵

Descriptive analyses compared the rates of BP remeasurement and the offers for and fulfillment of timely primary care follow-up in the 6 months before (August 2020 to February 2021) and after (February 2021 to August 2021) BP Connect implementation. Multivariable logistic regression, controlling for age, insurance, hypertension, and CVD, evaluated impacts on BP remeasurement and timely primary care follow-up.

RESULTS: BP was elevated in 676 preimplementation and 708 postimplementation visits. The [Table](#) describes the sociodemographics and relevant comorbidity of the patient visits. The only statistically significant difference between the pre- and postimplementation visit cohorts was a higher proportion insured by Medicaid before implementation (16% vs 11%, $P = .004$). The rate of BP remeasurement increased from 19% before implementation to 76% after implementation ($P < .001$). Staff provided patient education in 83% of postimplementation visits where patients had confirmed high BP and offered a referral for primary care follow-up in 60% of instances. Overall, the rate of timely primary care follow-up for high BP increased from 28%

before implementation to 48% after implementation ($P < .001$) despite implementation during the COVID-19 pandemic. BP Connect implementation resulted in a 12-fold increase in BP remeasurement among patients with high BP in unadjusted (odds ratio [OR], 12.6; 95% confidence interval [CI], 9.6–16.6; $P < .001$) and adjusted (OR, 12.9; 95% CI, 9.7–17.1; $P < .001$) models. Timely primary care follow-up for hypertension doubled after BP Connect implementation (adjusted OR, 2.2; 95% CI, 1.5–3.1; $P < .001$).

CONCLUSION: BP Connect implementation was feasible in academic gynecology clinics and doubled the likelihood of patients with high BP having timely primary care follow-up without creating an undue burden on specialty clinics. The impact of BP Connect in gynecology clinics on timely primary care follow-up was almost identical to that seen in the rheumatology clinics where the intervention was initially developed and tested. Subsequent work will examine its impact on hypertension and CVD in more diverse populations and explore its impact when implemented at postpartum visits. ■

Makeba Williams, MD, FACOG, NCMP
Division of Academic Specialists in Obstetrics and Gynecology
Department of Obstetrics and Gynecology
University of Wisconsin School of Medicine and Public Health
1010 Mound St.
Madison, WI 53715
makebalwilliams@hotmail.com
[@WUSTL.EDU](https://twitter.com/WUSTL.EDU)

Heidi W. Brown, MD, MAS, FACOG
Division of Female Pelvic Medicine and Reconstructive Surgery
Department of Obstetrics and Gynecology
University of Wisconsin School of Medicine and Public Health
Madison, WI

Edmond Ramly, PhD
Department of Family Medicine and Community Health
University of Wisconsin School of Medicine and Public Health
Madison, WI

Monica L. Messina, PhD
Division of Rheumatology
Department of Medicine
University of Wisconsin School of Medicine and Public Health
Madison, WI

Bret M. Hanlon, PhD
Department of Biostatistics and Medical Informatics
University of Wisconsin School of Medicine and Public Health
Madison, WI

TABLE

Sample characteristics and outcomes of patient visits with high BP before and after BP Connect implementation

Characteristic	Before implementation (n=676)	After implementation (n=708)	P value
Age (y), mean (SD)	63.29 (14.94)	64.48 (14.84)	.136
Primary care provider in the health system	358 (53.0)	395 (55.8)	.316
Self-reported race			
African American or Black	28 (4.1)	42 (5.9)	.15
Other	40 (5.9)	31 (4.4)	
White	608 (89.9)	635 (89.7)	
Self-reported ethnicity: Hispanic or Latinx	24 (3.6)	13 (1.8)	.07
Primary language: English	664 (98.2)	692 (97.7)	.653
Marital status			.092
Married or with partner	422 (62.6)	403 (57.3)	
Separated, divorced, or widowed	135 (20.0)	172 (24.5)	
Single	117 (17.4)	128 (18.2)	
Medicaid insured	110 (16.3)	77 (10.9)	.004
Tobacco use			.449
Never	402 (59.6)	411 (58.1)	
Former	214 (31.7)	244 (34.5)	
Current	59 (8.7)	53 (7.5)	
BMI (kg/m ²), mean (SD)	31.00 (8.36)	30.24 (8.16)	.089
BMI categories (kg/m ²)			.125
Underweight (<18.5)	5 (0.7)	6 (0.9)	
Normal weight (18.5–24.9)	164 (24.3)	179 (25.5)	
Overweight (25.0–29.9)	199 (29.5)	240 (34.2)	
Obese (≥30)	307 (45.5)	276 (39.4)	
Hypertension	403 (59.6)	458 (64.7)	.059
Cardiovascular disease	150 (22.2)	172 (24.3)	.388
Emergency department visits in the last year, mean (SD)	5.39 (4.79)	4.92 (4.96)	.071
Primary care provider visits in the last year, mean (SD)	1.47 (2.18)	1.45 (2.20)	.885
Outcomes			
Remeasurement	129/676 (19.1)	541/708 (76.4)	<.001
Confirmed high BP	—	404/541 (74.7)	
Education provided	—	334/404 (82.7)	
Follow-up referral offer	—	241/404 (59.7)	
Timely primary care follow-up for patients with in-system primary care	100/358 (27.9)	113/238 (47.4)	<.001

Data are presented as number (percentage) or number/total number (percentage), unless otherwise specified.

BMI, body mass index; BP, blood pressure; SD, standard deviation.

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Anisa M. Carlson, BA
Division of Academic Specialists in Obstetrics and Gynecology
Department of Obstetrics and Gynecology
University of Wisconsin School of Medicine and Public Health
Madison, WI

Christie M. Bartels, MD, MS
Division of Rheumatology
Department of Medicine
University of Wisconsin School of Medicine and Public Health
Madison, WI

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REFERENCES

1. Farley TA, Dalal MA, Mostashari F, Frieden TR. Deaths preventable in the U.S. by improvements in use of clinical preventive services. *Am J Prev Med* 2010;38:600–9.
2. Schmittiel J, Selby JV, Swain B, et al. Missed opportunities in cardiovascular disease prevention?: low rates of hypertension recognition for women at medicine and obstetrics-gynecology clinics. *Hypertension* 2011;57:717–22.
3. Bartels CM, Ramly E, Johnson HM, et al. Connecting rheumatology patients to primary care for high blood pressure: specialty clinic protocol improves follow-up and population blood pressures. *Arthritis Care Res (Hoboken)* 2019;71:461–70.
4. Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a report of the American College of Cardiology/American Heart Association Task Force on clinical practice guidelines. *J Am Coll Cardiol* 2018;71:e127–248.
5. Bartels CM, Ramly E, Panyard D, et al. BP Connect: improving follow-up after high blood pressures. *HIPxChange* 2020. Available at: <https://www.hipxchange.org/BPConnect>. Accessed March 23, 2021.

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