

Telehealth and In-Person Follow-Up for New Blood Pressure Treatments Show Similar Outcomes

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Key Findings:

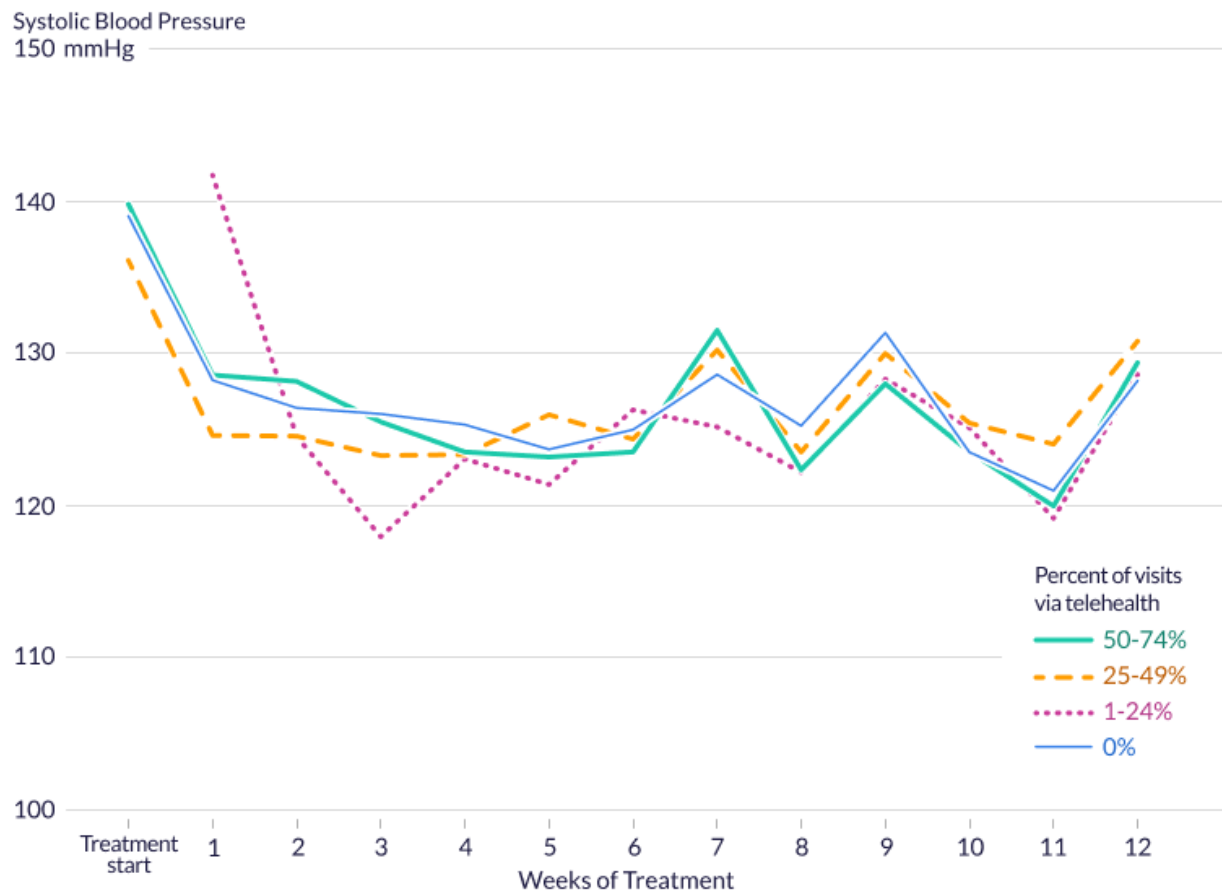
- After starting antihypertensive therapy, patients with a high proportion of telehealth encounters (50–74% of outpatient visits) had systolic blood pressure levels comparable to those with entirely in-person care throughout the first 12 weeks.
- Regardless of the proportion of care conducted by telehealth, differences in systolic blood pressure at follow up were small and inconsistent, with many weeks showing no statistically significant difference compared with only in-person care.

Telehealth has become a routine component of outpatient follow-up care. For patients newly diagnosed with hypertension, early follow-up after medication initiation is critical for adjustment and blood pressure control.¹ Some researchers have raised concerns that telehealth visits may result in fewer documented blood pressure measurements and less frequent medication intensification compared with in-person care,² though trials have generally not found telehealth to be inferior for hypertension management.³ Evaluating short-term systolic blood pressure trends can help determine whether greater reliance on telehealth compromises early hypertension management or performs similarly to traditional face-to-face care.

We studied 24,325 adults aged 18 years or older in the U.S. who were newly diagnosed with hypertension and received their first antihypertensive medication prescription between January 1, 2021, and November 1, 2025. Telehealth engagement was defined as the proportion of outpatient encounters conducted by telehealth categorized as 0%, 1–24%, 25–49%, or 50–74% after the antihypertensive was ordered. There were too few patients who had 75% or more of their follow-up visits via telehealth to include that group in this analysis. We accounted for baseline systolic blood pressure category, demographics, rurality and social vulnerability based on residence, smoking history, antihypertensive class, and comorbidities (including diabetes, hyperlipidemia, cardiovascular disease, and prior major adverse cardiovascular events).

We found that greater use of telehealth for follow-up care was not associated with better or worse short-term systolic blood pressure readings after initiation of antihypertensive medication. Compared with patients who had no telehealth visits, those with higher telehealth engagement had similar systolic blood pressure levels across most of the 12-week follow-up period. Differences between telehealth groups were small, and many weekly comparisons were not statistically significant.

Weekly Adjusted Systolic Blood Pressure by Telehealth Visit Proportion



N=24,279 adults

"Weekly Adjusted Systolic Blood Pressure by Telehealth Visit Proportion," 2026. EpicResearch.org

Figure 1. The weekly adjusted systolic blood pressure of patients following initiation of antihypertensives by the proportion of their visits conducted by telehealth.

Overall, the results suggest that telehealth-dominant follow-up care performs comparably to in-person care for early blood pressure control.

These data come from Cosmos, a dataset created in collaboration with a community of Epic health systems representing more than 300 million patient records from 1,800 hospitals and more than 42,000 clinics from all 50 U.S. states, Canada, Lebanon, and Saudi Arabia. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions. Graphics by Brian Olson.

References

1. Whelton PK, Carey RM. The 2017 Clinical Practice Guideline for High Blood Pressure. JAMA. 2017;318(21):2073-2074. doi:10.1001/jama.2017.18209
2. Clinical case study: Telehealth for hypertension. American Medical Association. July 16, 2021. <https://www.ama-assn.org/public-health/prevention-wellness/clinical-case-study-telehealth-hypertension>. Accessed December 29, 2025.
3. Omboni S, McManus RJ, Bosworth HB, et al. Evidence and Recommendations on the Use of Telemedicine for the Management of Arterial Hypertension: An International Expert Position Paper. Hypertension. 2020;76(5):1368-1383. doi:10.1161/HYPERTENSIONAHA.120.15873

Data Definitions

Term	Definition
Study period	1/1/2021 to 11/1/2025
Study population: inclusion	Patients: • Aged 18 or older on index date • With an initial hypertension diagnosis within 30 days prior to the index date • With their first pair of high BP readings with the second being within 30 days prior to the index date • With an order for an antihypertensive medication on index date • With at least one outpatient face-to-face visit or telehealth visit 6 to 18 months prior to index date • With a residence in the U.S.
Study population: exclusion	Pregnancy overlapping with index date and end date Advanced chronic kidney disease diagnosis on or before index date Dispense, patient reported, or prescription for an antihypertensive before the index date
Index date	Date of first order for an antihypertensive medication meeting inclusion criterion
End date	N weeks, where N is a bucket in the BP outcomes
Exposures	Proportion of visits done via telehealth compared to in person, prior to the outcome • 0% • 1-24% • 25-49% • 50-74% • 75%+
Outcomes	Mean systolic blood pressure at (mean of last recorded BP per-visit within window): • 0 weeks: 0-6 days • 1 week: 7-13 days • 2 weeks: 14-20 days • 3 weeks: 21-27 days • 4 weeks: 28-34 days • 5 weeks: 35-41 days • 6 weeks: 42-48 days • 7 weeks: 49-55 days • 8 weeks: 56-62 days

	• 9 weeks: 63–69 days • 10 weeks: 70–76 days • 11 weeks: 77–83 days • 12 weeks: 84–91 days
Confounders	Average systolic blood pressure from 12 months prior to index through index date (from the final reading from outpatient face-to-face visits) • <140 • 140–149 • 150–159 • 160–169 • 170+ Patient age (as of index date) • 18–34 • 35–54 • 55–64 • 65–79 • 80+ Evaluated sex RUCA: Metropolitan, Micropolitan, Small Town, Rural, Other Race and ethnicity Comorbidities: History of MACE, CVD, diabetes, hyperlipidemia (as of index date) Type of antihypertensive Social Vulnerability Index quintile Has ever smoked?
Hypertension	A billing, encounter, or problem list diagnosis with ICD-10-CM code I10–I16* or I1A*
Pair of high BP readings	Blood pressure results that are $\geq 130/80$ that are between 14 and 180 days apart from an outpatient face-to-face visit or telehealth visit , last result from the visit being the one that was used
Antihypertensive medication	An order with a type of “prescription” and one of the following ATC codes: Beta blockers: ATC code C07AA* or C07AB* Ace inhibitors, plain: ATC code C09A* ARBs, plain: ATC code C09C* Thiazide-like diuretics: ATC code C03A* Calcium channel blockers: ATC code C08* (except C08G*)
Pregnancy	A pregnancy episode or a billing or encounter diagnosis with ICD-10-CM code O*
Advanced chronic kidney disease diagnosis	A billing, encounter, or problem list diagnosis with ICD-10 code of N18.5 or N18.6
Telehealth visit	Encounter type of telemedicine OR any type with CPT code 99441–99443
Outpatient face-to-face visit	Encounter type of Office Visit, Follow-up, Walk-In, or Postpartum Visit that is not a telehealth visit
MACE	A billing or encounter diagnosis with: • Unstable angina: ICD-10-CM I20.0* • Stable angina: ICD-10-CM I20.1*–I20.9* • Stroke: ICD-10-CM I60*, I63*, G45.9 • MI: ICD-10-CM I21*–I23* • CHF: ICD-10-CM I50*

CVD	A billing or encounter diagnosis with ICD-10-CM code I20*-I26*, I30*-I39*, I40*-I49*, I51*, or I70*-I79*
Diabetes	A billing or encounter diagnosis with ICD-10-CM code E08*-E13*
Hyperlipidemia	A billing or encounter diagnosis with ICD-10-CM code E78.2*-E78.5*
Race and ethnicity	Patients categorized based on self-reported race and ethnicity mapped to standards into: American Indian, Asian, Black, Hispanic, Pacific Islander, White, or Multiracial, Unknown
Model specifications	Linear Regression. Adjusted levels were calculated using reference-category adjustment. Formula: Intercept + Coefficient of exposure Reference categories: Antihypertensive Med: ACE Inhibitors Sex: Female Starting Systolic BP: <140 Age: 18-34 SVI Quintile: 0-20% Race/Ethnicity: Asian RUCA: Metropolitan BMI: Healthy No Smoking History No History of MACE No History of CVD No History of Diabetes No History of Hyperlipidemia
Limitations	Cosmos may not have all blood pressure measurements from telehealth visits or measurements taken at home. Categorizing patients by the percentage of encounters conducted by telehealth introduces selection bias, as assignment to intermediate categories requires a minimum number of encounters. As a result, patients with lower healthcare utilization are underrepresented in these groups, limiting comparability across exposure categories.

Table 1: Weekly Adjusted Systolic Blood Pressure by Telehealth Visit Proportion

% Telehealth	Treatment Start	1	2	3	4	5	6
0%	139.01 (138.03-139.99)	128.23 (123.70-132.76)	126.41 (122.71-130.11)	126.02 (122.16-129.87)	125.31 (122.36-128.26)	123.69 (119.76-127.63)	124.98 (121.07-128.90)
1-24%	-	141.70 (120.04-163.36)	124.53 (111.90-137.17)	117.95 (106.45-129.45)	123.06 (115.77-130.35)	121.38 (112.44-130.32)	126.28 (118.31-134.25)
25-49%	136.09 (130.72-141.46)	124.60 (115.39-133.81)	124.55 (117.40-131.70)	123.28 (116.38-130.18)	123.34 (117.88-128.80)	125.96 (119.29-132.64)	124.36 (117.78-130.93)
50-74%	139.79 (137.17-142.42)	128.57 (119.24-137.89)	128.15 (121.07-135.22)	125.49 (117.97-133.01)	123.51 (117.23-129.78)	123.18 (115.21-131.16)	123.52 (115.06-131.98)

% Telehealth	7	8	9	10	11	12
0%	128.60 (124.12- 133.08)	125.23 (120.97- 129.49)	131.35 (126.92- 135.78)	123.50 (118.81- 128.19)	120.97 (116.33- 125.61)	128.18 (122.81- 133.56)
1-24%	125.16 (116.21- 134.12)	122.18 (113.82- 130.54)	128.30 (120.27- 136.34)	125.11 (117.05- 133.18)	119.16 (111.45- 126.88)	128.60 (120.18- 137.03)
25-49%	130.21 (122.79- 137.62)	123.51 (116.34- 130.68)	129.99 (122.68- 137.30)	125.42 (117.52- 133.32)	124.03 (116.48- 131.58)	130.79 (122.49- 139.10)
50-74%	131.51 (121.54- 141.48)	122.34 (113.31- 131.36)	127.99 (119.37- 136.61)	123.54 (114.01- 133.06)	119.97 (111.04- 128.89)	129.38 (119.10- 139.66)