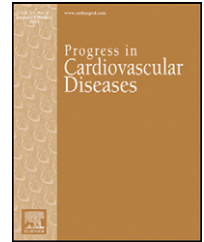


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New Concepts in Hypertension Management: A Population-Based Perspective

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ABSTRACT

Hypertension (HTN) is the most common chronic disease in the U.S., and the standard model of office-based care delivery has yielded suboptimal outcomes, with approximately 50% of affected patients not achieving blood pressure (BP) control. Poor population-level BP control has been primarily attributed to therapeutic inertia and low patient engagement. New models of care delivery utilizing patient-generated health data, comprehensive assessment of social health determinants, computerized algorithms generating tailored interventions, frequent communication and reporting, and non-physician providers organized as an integrated practice unit, have the potential to transform population-based HTN control. This review will highlight the importance of these elements and construct the rationale for a reengineered model of care delivery for populations with HTN.

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Hypertension (HTN) remains the most common chronic condition, affecting 30% of U.S. adults and is the leading diagnoses made during a primary care office visit.¹ In the U.S. alone, the estimated annual cost of HTN exceeds \$50 billion, and across the globe, HTN is responsible for approximately 10% of all healthcare spending.^{2,3} Roughly half of individuals with HTN have not achieved guideline-recommended blood pressure (BP) targets; as a result, HTN is one of the nation's leading causes of death, responsible for one in six deaths among adults annually. Additionally, uncontrolled HTN increases non-fatal myocardial infarction and stroke and remains the second leading cause of renal failure. Since the year 2000, HTN-related deaths in the U.S. have risen by 23% whereas all other causes of death combined over this same period have fallen by 21%.⁴ Achieving improved population-based BP control remains a primary objective of

public health policy and healthcare financing organizations across the globe yet efforts have been limited to minor adjustments in the current model of office-based care delivery.^{5,6}

Improving hypertension control in the population

Why such a large percentage of HTN patients fail to achieve BP control remains an area of intense interest. When comparing patients with controlled versus uncontrolled HTN, routine characteristics such as age, gender, health insurance, and visit frequency are remarkably similar. In NHANES III, 92% of patients with uncontrolled HTN possessed health insurance, and 86% reported a regular source of healthcare.⁷ In fact, patients with uncontrolled HTN saw

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Abbreviations and Acronyms

BP = Blood pressure

CV = Cardiovascular

HTN = Hypertension

IPU = Integrated practice unit

PGHD = Patient-generated health data

The failure to augment therapy in order to achieve disease-specific treatment goals has been coined “therapeutic inertia”, and consists of three domains of responsibility: the clinician, the patient, and the healthcare system.⁸ (Table 1) When evaluating patients with uncontrolled HTN, the prevalence of therapeutic inertia has been reported to be as high as 87% of provider visits, thus offering the potential for quality improvement initiatives targeting this shortcoming in clinical care.⁹ This failure at the provider level can be ameliorated by use of guideline-based protocols executed by non-physician providers working in a “focused-factory” model of care delivery.⁸ Organizing care utilizing specialized integrated practice units (IPUs), offers such a potential.

An IPU utilizes non-physician personnel dedicated to a specific disease condition for the full cycle of care.^{10,11}

their physician an average of 4.3 times per year, a frequency similar to that of patients with controlled HTN. What is noteworthy however, is in only 22%–38% of these visits was pharmacologic therapy either started or intensified.

Members of the care team may include pharmacists, advanced practice clinicians, nurses, health educators, dietitians, social workers, counselors and therapists, all organized around the patient’s medical condition. In this model, patients can be more frequently and effectively connected to the health delivery system utilizing apps as well as home-based and wearable devices, and communication can be consistent and at regular intervals between the care team and the patient.⁸ Patients can achieve a higher level of engagement in the care process via enhanced education, real-time feedback via wearable and home-based devices, and enriched communication with both the care team and other patients via social networks, thus achieving high satisfaction and improved outcomes within the healthcare system (Fig 1).

The role of patient-generated health data in hypertension management

Home BP collection has been endorsed by many HTN guidelines, and addresses several limitations of traditional office-based care, including a larger sample of biologic data, reducing misclassification due to white-coat or masked HTN, and an ability to take more timely action and course correct therapy.^{12–15} Home measurements better predict cardiovascular (CV) risk than do office measurements, are more

Table 1 – Factors Leading to Therapeutic Inertia and Methods to Enhance Therapeutic Activation.

Therapeutic Inertia	Therapeutic Activation
Clinician	
Failure to initiate treatment	Guideline-based therapy using non-physician providers
Failure to titrate to goal	Guideline-based therapy using non-physician providers
Failure to set clear goals	Co-creation of treatment plan with patient
Underestimation of patient need	Needs assessment upon enrollment
Failure to identify & manage comorbidities	Screen for related co-morbidities
Insufficient time	IPU-model of care delivery
Insufficient focus on goal attainment	IPU-model of care delivery
Reactive rather than proactive	Weekly patient-generated health data
Patient	
Medication side-effects	Screening and close follow-up by care team
Too many medications	Medication simplification by clinical pharmacist
Cost of medications	Screening for medication affordability, use of generic alternatives, patient assistance programs
Denial of disease	Disease-focused education, patient engagement
Denial of disease severity	Disease-focused education, patient engagement
Forgetfulness	Medication reminders (apps, pill boxes, etc.)
Perception of low susceptibility	Develop concept of total CV risk
Absence of disease symptoms	Develop concept of total CV risk, patient education
Poor communication with MD	Monthly reports to patient, routine calls
Mistrust of clinician	Work towards building trust, regular communication
Depression, mental illness, substance abuse	Screening for depression, substance abuse
Low health literacy	Screening for health literacy; use of modified education, Rx. labeling
Health system	
Lack of clinical guideline	Use of current evidence-based guidelines
Lack of care coordination	IPU creates single point of contact
No visit planning	Calls and outreach built into EMR
Lack of decision support	CDS tools guide which patients need what help, when
Poor communication between MD & staff	Monthly reports to patients and providers, routine calls
No disease registry	Registry created in EMR
No active outreach	IPU creates active outreach to patient’s home

Abbreviations: CDS = clinical decision support, CV = cardiovascular, EMR = electronic medical record, IPU = integrated practice unit

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