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## ***Investing in Our Future: the Importance of Ambulatory Visits to Achieving Blood Pressure Control in Young Adults***

**Holly C. Gooding, MD, MSC, Courtney Brown, BA, and Lauren E. Wisk, PhD**

### **Keywords**

hypertension; young adult; primary care

Hypertension is a strong risk factor for cardiovascular disease and stroke.<sup>1</sup> Focusing on identifying hypertension early, and getting blood pressure to goal preferably without the use of medication, is important for a multitude of reasons. First, elevated blood pressure tracks over time, such that elevated blood pressure in adolescence and young adulthood is strongly associated with elevated blood pressure later in life.<sup>2</sup> Second, there is evidence that early-onset hypertension (before age 45 years) is associated with a higher risk of cardiovascular death compared to hypertension that develops later.<sup>3</sup> Third, even those individuals whose blood pressure is treated to goal with medications do not have the same outcome as those whose blood pressure was never elevated in the first place – they have higher left ventricular mass index and twice the cardiovascular disease event rate despite the same blood pressure levels.<sup>4</sup> Thus primordial prevention, defined as the prevention of cardiovascular disease risk factors like hypertension before they ever occur,<sup>5</sup> is critical to reducing the morbidity and mortality from cardiovascular disease.

Unfortunately, the prevalence of hypertension in younger adults is increasing.<sup>6,7</sup> Likely contributing factors include increases in sodium intake, body mass index, stress, smoking, and sleep problems.<sup>7,8</sup> Rates of hypertension awareness and control are also among the lowest in young adults.<sup>9,10</sup> Hypertension in younger adults often goes undiagnosed and undertreated even when young adults are connected to routine primary care,<sup>11</sup> perhaps reflecting clinical inertia on the part of treating clinicians or reluctance to label young people as hypertensive.

The article by King et al in this issue of the Journal identifies important factors associated with achieving blood pressure control in young adults in the clinical setting. The authors set out to determine the relationship between ambulatory visit interval and hypertension control among young adults ages 18-39 years who were newly diagnosed with hypertension. They drew upon a unique dataset of almost 3000 young adults with incident hypertension seen in a large academic group practice in the Midwest of the United States between 2008-2011.

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Corresponding Author: Holly C. Gooding, MD, MS, Assistant Professor of Medicine and Pediatrics, Division of Adolescent and Young Adult Medicine Boston Children's Hospital, 300 Longwood Avenue, Boston, MA 02115, holly.gooding@childrens.harvard.edu | phone: 857-218-5037 | fax: 617-730-0184.

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They looked prospectively for 24 months from the date of incident hypertension (defined by JNC7 criteria and an electronic health record diagnosis of hypertension) to see if ambulatory visit interval was associated with time to blood pressure control.

Notably, only 52% of the sample achieved a blood pressure of <140/90 mmHg for three consecutive measurement dates during the study period. Almost all (91%) of the young adults who had a subsequent visit within 1 month achieved this goal, compared to just 13% of those with an interval of 6 months or more in between visits. The actual time to blood pressure control was 2.8 months in those who had their first visit within 1 month compared to 7.1 months in those with a visit interval of 1-2 months and 16.4 months in those with a visit interval of 3-6 months. Only 26% of the young adults were started on an antihypertensive medication. Rates of antihypertensive prescription use were actually lowest in those with less than a 1 month interval between ambulatory visits (21%), suggesting that many of these young people were able to achieve blood pressure control with intensive lifestyle counseling alone. Not surprisingly, individuals who were overweight or currently used tobacco were also less likely to achieve blood pressure control, again highlighting the importance of addressing lifestyle factors in hypertension management. Patient age, gender, and type of provider seen (family practice vs. internal medicine vs. other) did not predict time to hypertension control in adjusted models.

The authors should be commended for utilizing electronic health record data from real world practice. Notable limitations to their approach include the lack of data on young adults who accessed only urgent or emergency care services, or those seen infrequently in non-urgent settings (e.g., seen in primary care only every few years). Unfortunately, many young adults only access care via emergency services or access primary care sporadically;<sup>12,13</sup> the authors own data suggest those individuals least connected to regular ambulatory care are perhaps the least likely to achieve blood pressure control. An additional limitation is the reliance on blood pressures measured in the clinic setting for both the definition of incident hypertension and hypertension control. While certainly reflective of the standard of clinical care at the time of both the analysis and the writing of this commentary, there is a move toward use of ambulatory blood pressure monitoring to diagnose hypertension.<sup>14</sup> It is curious that the authors chose not to control for anti-hypertension medication use in their final models, as there is good reason to suspect medication use is associated with both blood pressure control and follow-up interval. Finally, while the authors state provider specialty and gender were not associated with blood pressure control, they were associated with visit interval and thus important interactions between these provider factors and cardiovascular outcomes remain an interesting area for future investigation.

Importantly, this sample of young adults reflects a population with unique and precarious access to care. Young adults traditionally experience high rates of uninsurance and low rates of a usual source of ambulatory care, both of which contribute to unmet medical needs.<sup>15</sup> Health insurance is a well-established facilitator of access to care for individuals of all ages and there is mounting evidence for the specific health and utilization benefits for young adults as a result of expanded coverage from the Affordable Care Act (ACA), including improved rates of blood pressure screening.<sup>16</sup> Further, access to health insurance increases the likelihood of reporting a usual source of care, which in turn is associated with increased

delivery of preventive care among young adults.<sup>17</sup> Yet simply having a usual source of care is not sufficient for ensuring timely and appropriate care or successful medical management, as this paper importantly indicates. Instead, visit frequency and likely the enhanced clinical relationship resulting from greater visit frequency are primary drivers of achieving hypertension control.

A substantial threat to frequent medical follow-up for this population is the high drop-out from primary care during the transition from pediatric- to adult-focused care, generally recommended for all young adults between 18 and 21 years.<sup>18</sup> Indeed in this analysis, a small proportion of the sample still received their ambulatory care in Pediatrics/Adolescent Medicine. Evidence suggests that a majority of young adults transfer their primary care later than recommended and often with gaps of more than a year,<sup>13</sup> which as King et al suggest could expose them to longer periods of elevated blood pressure and increased risk of future cardiovascular events. Moreover, such gaps in care may contribute to delays in both the diagnosis and successful treatment of hypertension, making the need to keep young adults continuously connected to care even more salient.

Although the ACA has led to measurable coverage gains for young adults,<sup>19</sup> the present uncertainty surrounding health reform raises concerns that young adults may experience disruption of health insurance coverage, either from roll-backs of Medicaid expansions, elimination of the individual mandate, or the proposed financial penalty for coverage gaps.<sup>20,21</sup> Even if the availability of affordable insurance coverage was only threatened for a portion of the nearly 7 million young adults who become newly insured under the ACA, the population burden of undiagnosed or untreated hypertension in this cohort could be devastating in both the near- and far-term.<sup>22</sup> Any privately-insured individual may further be affected by proposed changes to the essential health benefits provision that could undermine access to preventive screenings, such as annual blood pressure checks or routine well-exams, or lead to prohibitively high prescription drugs costs among those who require antihypertensive medication.<sup>23</sup> As such, King et al.'s findings should be carefully considered in light of the uncertainty around the future of insurance reform. Follow-up encounter interval is clearly an important predictor of hypertension control. Ensuring the optimal encounter interval will continue to be a challenge, one tightly linked to both the policy context and the developmental needs of young adults.

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