

# Barriers to Referral for Elevated Blood Pressure in the Emergency Department and Differences Between Provider Type

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A multidisciplinary sample of emergency department providers across the United States (n=450) were surveyed to identify barriers to referral for elevated blood pressure (BP) in the emergency department and differences between provider type. Registered nurses reported less knowledge of stage I hypertension ( $P=.043$ ) and prehypertension ( $P<.01$ ); were less aware of definitions for hypertension ( $P<.001$ ); reported more difficulty in caring for patients who are asymptomatic ( $P=.007$ ); required financial compensation to refer ( $P=.048$ ); and perceived that BP referrals are

influenced by the medical director ( $P<.001$ ). Medical doctors reported more skills to refer ( $P=.008$ ) and time as a barrier ( $P=.038$ ). Physician assistants were more likely to report patients are not aware of health benefits ( $P=.035$ ), doubted their concern for their BP ( $P=.023$ ), and felt emotionally uncomfortable when referring ( $P=.025$ ). Despite these differences, there was no significant difference between provider type and referral rates. *J Clin Hypertens (Greenwich)*. 2015;17:207–214. © 2015 Wiley Periodicals, Inc.

Implementation of emergency-based guidelines is an established principle of health care, especially when they address areas of high priority. Referral for asymptomatic hypertension (HTN) is one such condition. In 2006, the American College of Emergency Physicians (ACEP) published a guideline that recommends referral for all adult patients who have at least two blood pressure (BP) readings  $\geq 140/90$  mm Hg during their emergency department (ED) visit.<sup>1</sup> However, implementing this guideline appears to be problematic because studies have found that only 7% to 25%<sup>2–5</sup> of patients are referred and few data exist to understand why.

Failing to recognize and address HTN in the ED may represent a missed opportunity to prevent the progression of undiagnosed or undertreated HTN.<sup>1</sup> Multidisciplinary collaboration is necessary to provide optimal care for patients treated in the ED. From the standpoint of future research and policy, understanding disciplinary-specific perspectives regarding referral for elevated BP is crucial prior to the implementation of any multidisciplinary intervention that would aim to improve referral for asymptomatic HTN.

## MATERIALS AND METHODS

Cabana and colleagues<sup>6</sup> identified that specific barriers, eg, knowledge, attitudes, and external factors, influence provider practice patterns. This cross-sectional survey examined self-reported barriers (knowledge, attitudes, and external factors) to referral for elevated BP in the ED and differences between provider type. After institutional review board approval, data collection began

using a multidisciplinary and random sample of active members from three professional organizations in the United States—the American Medical Association (AMA), the Society of Emergency Physician Assistants (SEMPA), and the Emergency Nurses Association (ENA).

First, the questionnaire was pilot tested using a sample of ED providers not included in the study sample. Participants were given the option to complete the survey using a hard copy or by completing and submitting it electronically via a SurveyMonkey link (Palo Alto, CA). Three contacts were made (pre-notice postcard, letter for survey participation, and reminder letter). A prepaid financial incentive of \$10 and a stamped return envelope for those wishing to complete the survey by hand was provided. One hundred fifty members from each group were randomly selected from each list provided by the professional organization and asked to participate in the survey (N=450).

## Sample Size Calculation

This study examined self-reported barriers to referral and differences between provider type. A sample size was calculated based on the primary aim of the study, not presented here, which examined self-reported barriers associated with referral. Previous studies that examined self-reported barriers to guideline adherence measure adherence as following the guideline “at least 75% of the time.”<sup>6–9</sup> Previous studies have also indicated that referral rates based on retrospective chart review are as low as 10% to 20% following a repeated systolic BP (SBP)  $\geq 140$  mm Hg or diastolic BP (DBP)  $\geq 90$  mm Hg in the ED.<sup>3</sup> Sample size calculation was performed to examine the differences between referral rates ( $\geq 75\%$  of the time vs refer  $\leq 75\%$  of the time) of those with and without a potential barrier to referral, with type 1 and 2 error rates of 5% and 20%, respectively. To be conservative and prepare for an

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inconsistent pattern of barriers among each of the provider groups, a sample of 450 would be sufficient to detect differences of 0.1 vs at least 0.19 in those with and without a barrier, respectively, and an odds ratio (OR) of 2.16. With a 50% response rate, the total sample would be sufficient to detect differences of 0.1 vs at least 0.24 and an OR of 2.83.

## Measures

Multifaceted interventions built on a careful assessment of barriers to guideline implementation may be more effective than those that are not. Keeping this in mind, it was important to use a measure that examined a multitude of barriers. However, this proved to be a challenge, as no validated instrument was found that specifically examines the ED provider and/or ED provider barriers to referral for elevated BP. Based on the conceptual framework of Cabana and colleagues,<sup>6</sup> which guided this study, knowledge, attitudes, and external factors were examined. A knowledge survey was developed by the first author and based on the literature.<sup>10</sup> Attitudes and external factors were assessed using a validated instrument (described below) that had the ability to examine the guideline of interest.<sup>11</sup> However, additional items were added to this survey to ensure a comprehensive examination of barriers, which have not been formally developed into a survey, although based on the Delphi technique.<sup>12</sup>

**Knowledge (24 Items).** First, knowledge was assessed in three parts. In part I, 12 items were constructed to assess knowledge of the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure<sup>13</sup> (JNC 7) definitions of HTN (4 items), knowledge of what action to take according to the ACEP policy (4 items), and knowledge of the correct BP threshold for reassessment/referral of an elevated BP per the ACEP policy (4 items). Scoring for each of the 12 items was dichotomized to “correct” vs “incorrect” answers, for a total potential score of 12 of 12 correct or 100%. The higher the score the higher level of knowledge.

For part II of the knowledge assessment, two close-ended questions (13, 14) about *awareness* of the JNC 7 and ACEP recommendations were asked, with answer choices as “yes,” “no,” or “I do not know” and two close-ended multiple choice questions (15, 16) about the extent of *familiarity* with JNC 7 and ACEP questions, with answer choices and scoring as: “not at all familiar” as score 1, “somewhat familiar” as score 2, “neutral” as score 3, “familiar” as score 4, and “very familiar” as score 5. For awareness, answers were dichotomized to percentage of “yes” and percentage of “no” plus “I do not know”.

Part III of the knowledge assessment was based on the literature.<sup>10</sup> Providers were asked to: “Please rate, on a scale of 1 to 10, how common you think each cause is to affect BP in the emergency department patient (1=not a

common cause and 10=a very common cause).<sup>10</sup> Responses included pain, uncontrolled and diagnosed HTN, undiagnosed HTN, anxiety, improper BP cuff fit, inaccurate reading, or other (please specify). Percentage of each perceived cause of elevated BP response was calculated.

**Attitudes/External Factors (50 Items).** The Barriers and Facilitators to Assessment Instrument (BFAI)<sup>11</sup> (25 items) was used to assess attitudes (10 items) and external-related barriers (15 items [patient factors, 6 items; guideline factors [4 items]; and organizational factors [5 items]). Twenty-five of the 27 items were used for this study. Two items were removed because they were irrelevant, which was recommended by the authors of the instrument. The first part of the instrument consisted of rating various possible barriers to and facilitators of the general implementation of a “directive or innovation.” The second part of the instrument consisted of identification of barriers to and facilitators of implementation of preventive care in general. As recommended by the authors of the tool, questions were reworded to address the specific guideline being employed in the study, specifically, the words “directive or innovation” in the original questionnaire were replaced with the “ACEP guideline.” Item response and range have been measured by the developers of the instrument and 12 validation studies have been performed to test the psychometric characteristics of the questionnaire.<sup>11</sup> Psychometric tests during the development of the questionnaire included (between brackets the criteria): (1) response ( $\geq 60\%$ ) and item response ( $\geq 90\%$ ), (2) percentage (fully) (dis-)agree ( $\geq 10\%$  and  $\leq 90\%$ ), and (3) interquartile range ( $\geq 1$ ). If an item did not meet two or more criteria, then it was not included in the questionnaire. Values of Cronbach’s  $\alpha$  were not available at the time of the study.

In a systematic review and Delphi study,<sup>13</sup> 50 potentially relevant determinants of innovation processes were identified after the release of the BFAI,<sup>11</sup> which have not been developed into an instrument, and 25 of the 50 items developed are not included in the validated BFAI.<sup>11</sup> In order to ensure that there was a comprehensive examination of all possible determinants that may influence guideline adherence (referral) these items that were developed from this study<sup>13</sup> were added to the proposed survey (knowledge assessment plus BFAI) for exploration. These items were analyzed and are presented separately (25 items).

Items for both questionnaires were grouped into four categories: (1) guideline characteristics (2 items), (2) provider characteristics (10 items), (3) patient characteristics (6 items), and (4) organizational characteristics (5 items). Each category was then combined to form one composite score for analysis. Each category was analyzed as a composite score. However, each item was analyzed individually if significant differences between provider type and composite score were not found. For both questionnaires, respondents were asked to respond

using a five-point Likert-type scale, ranging from “fully agree,” which corresponds to a score of five, to “fully disagree,” which corresponds to a score of one. A binary choice design was chosen. For those who responded as “fully agree,” “agree,” or “do not agree nor disagree,” the new response was coded as being a “barrier.” For those who responded as “fully disagree” or “disagree,” the new response was coded as “not a barrier.” Providers who responded as “do not agree nor disagree” was coded as a barrier because having no opinion was considered to be a barrier to referral for elevated BP.

**Outcome—Referral (1 Item).** Providers were asked: “In the past 2 weeks, how often did you specifically refer an ED patient for outpatient BP evaluation if he/she had a repeated SBP measurement  $\geq 140$  mm Hg or DBP  $\geq 90$  mm Hg in the ED”? Response categories included “never” (0% of the time), “rarely” (1%–20%), “sometimes” (21%–50% of the time), “most of the time” (51%–75% of the time), and “almost always” ( $>75\%$  of the time) (Table I). Based on previous studies that have examined barriers to guideline adherence, referral was dichotomized to those who refer  $\geq 75\%$  of the time and those who refer  $\leq 75\%$  of the time.<sup>6,15,16</sup>

**Demographics (10 Items).** Provider demographic questions included: provider type (1), total years in any ED setting (2), sex (3), race/ethnicity of the provider (4), and work and shift status (5 and 6). Hospital demographic questions included number of each provider type (medical doctor [MD], physician assistant [PA], nurse practitioner [NP], registered nurse [RN]) working per shift (7), use of electronic medical records (EMRs) in the ED for patient progress note documentation (8), use of EMRs for MD/NP/PA order entry (9), and presence of current protocol to address patients who have asymptomatic HTN in the ED (10).

**TABLE I.** Referral and Differences Between Provider Type

	ED Provider Group			Total, No. (%)	P Value
	MD, No. (%)	PA, No. (%)	RN, No. (%)		
<b>Referral</b>					
Never: 0%	9 (17)	8 (9)	21 (3)	38 (10)	.022
Rarely: 10%–20%	7 (13)	17 (21)	28 (31)	52 (22)	
Sometimes: 21%–50%	15 (28)	32 (39)	21 (23)	68 (30)	
Most of the time: 51%–75%	12 (22)	16 (19)	14 (5)	42 (15)	
Almost always: $\geq 75\%$	11 (20)	10 (12)	7 (8)	28 (13)	
Abbreviations: ED, emergency department; MD, medical doctor; PA, physician assistant; RN, registered nurse.					

## Data Analysis

Data from SurveyMonkey were directly imported into the Statistical Program for the Social Sciences (SPSS, Chicago, IL). All returned handwritten surveys were double entered into an SPSS dataset. Data were analyzed with SPSS version 15.0. Descriptive statistics are presented in percentages. Bivariate analyses were conducted using independent *t* tests or analysis of variance and chi-square tests to test for significant relationships between the independent variables and the dependent variable.

## RESULTS

### Characteristics of Study Patients

This study achieved a 51% response rate (N=230). Sixty-two percent of participants were RNs (10% of whom were NPs [n=9]), 55% were PAs (n=85), and 35% were MDs (65% attending MDs [n=35] and 35% resident MDs [n=15]). Responders were more likely to be RNs (n=91; 39.6%) compared with MDs (23.5%) or PAs (37%) ( $P=.020$ ). Responders (40.8% male) and nonresponders (46.3% male) did not differ significantly by sex ( $P=.136$ ). However, responders were more likely to live in the Northeast and least likely to come from the West ( $P<.001$ ). A large proportion (87.0%) of the total sample was non-Hispanic white. No other provider demographics were available from any of the professional groups that would determine whether there were differences between responders and nonresponders.

In terms of hospital demographics, most of the ED providers had 10 or more years of ED experience, worked full-time (83.7%), and worked the day shift (35%). The majority of providers (77.0%) worked in EDs where EMRs were used for order entry and progress note documentation. However, only 15.0% of all ED providers worked in an ED where there was a policy in effect to address patients who present with asymptomatic HTN.

### Referral

One third of providers (n=68; 29.8%) referred to be evaluated “sometimes” (“21%–50% of the time”), followed by “rarely” (“10%–20% of the time”) (n=52; 22.8%). RNs (30.8%) were more likely to refer “rarely” or “10% to 20%” of the time compared with MDs (27.8%) and PAs (38.6%), who were more likely to refer “sometimes” or “21% to 50% of the time”. A greater proportion of MDs (20.4%) were more likely to refer  $\geq 75\%$  of the time, followed by PAs (12.2%) and RNs (7.7%); however, MDs did not refer at significantly higher rates than RNs ( $P=.073$ ) or PAs ( $P=.413$ ).

No significant differences were found between provider type and knowledge, attitudes, and external factors as a composite score. Individual items were therefore examined separately and each item showing significant differences between individual item and provider type are presented.

**Knowledge.** As shown in Table II, few differences were found between knowledge and provider type.

*Part I.* As shown in part I of the knowledge assessment in Table II, RNs (65%) were least likely to correctly define pre-HTN compared with MDs (93%) and PAs (83%) ( $P<.01$ ) and least likely to define the level for stage I HTN (74%) compared with MDs (85%) and PAs (88%) ( $P=.043$ ). As a whole, the majority of providers (51%) incorrectly defined stage II HTN as BP 160–169/90–99 mm Hg; however, this was followed by the correct definition as  $\geq 160/90$  mm Hg (35%).

In addition, RNs (59%) were least likely to identify the correct action for referral of an elevated SBP per the ACEP policy, compared with MDs (89%) and PAs

(72%) ( $P<.01$ ), but no difference was found for DBP ( $P=.121$ ). When asked to report their BP threshold for which they reassess/refer, similar results were found. RNs (20%) were least likely to report the correct SBP threshold for referral of an elevated SBP, with a similar proportion of PAs (31%) and MDs (30%) reporting the correct threshold. No other differences were found for reporting BP threshold.

*Part II—ACEP/JNC 7 awareness/familiarity.* About half of MDs and the majority of PAs were aware of the JNC 7 guidelines, while RNs were least likely to be aware ( $P<.001$ ). The majority of providers who were aware were somewhat familiar with it. In terms of the ACEP policy, MDs and PAs were more likely to be aware of it, while RNs were least likely to be aware

**TABLE II.** Correct Responses for Knowledge and Differences Between Provider Type

	ED Provider Group						P Value
	MD, No. (%)		PA, No. (%)		RN, No. (%)		
<b>Part I Knowledge of Knowledge Assessment</b>							
<b>Correct HTN definition</b>							
Normal BP: $\leq 120/80$ mm Hg	47 (87.0)		70 (81.7)		72 (78.3)		.576
Pre-HTN: 120–139/80–89 mm Hg	50 (92.6)		70 (83.8)		58 (64.8)		.010
Stage I HTN: 140–90 to 159/99 mm Hg	45 (84.9)		74 (87.7)		60 (73.6)		.043
Stage II HTN: $\geq 160-100$ mm Hg	15 (27.8)		33 (37.0)		35 (40.7)		.311
<b>Correct ACEP action</b>							
Refer $\uparrow$ SBP	4 (88.9)		61 (71.8)		53 (58.9)		.001
Reassess $\uparrow$ SBP	41 (75.9)		65 (76.5)		58 (63.7)		.172
Refer $\uparrow$ DBP	29 (53.7)		54 (64.3)		63 (69.2)		.121
Reassess $\uparrow$ DBP	36 (66.7)		61 (71.8)		73 (81.1)		.169
<b>Correct BP threshold</b>							
	SBP, No. (%)	DBP, No. (%)	SBP, No. (%)	DBP, No. (%)	SBP, No. (%)	DBP, No. (%)	
Chose the correct threshold for Reassessment	16 (29.6)	21 (41.2)	26 (30.9)	34 (43.6)	18 (20.0)	32 (37.6)	.217 .663
Chose the correct threshold for Referral	25 (46.3)	31 (59.6)	36 (32.1)	44 (54.5)	19 (19.8)	44 (51.2)	.007 .842
<b>Part II of knowledge assessment</b>							
<b>JNC 7 awareness</b>							
Aware	26 (48.1)		56 (64.7)		19 (20.9)		.001
Not aware	28 (51.9)		26 (31.7)		73 (79.3)		
<b>JNC 7 familiarity</b>							
Somewhat familiar	14 (53.8)		33(59.6)		12(65.0)		
<b>ACEP awareness</b>							
Aware	36 (66.7)		47 (56.8)		24 (27.2)		.001
Not aware	16 (29.6)		33 (38.3)		65 (70.7)		
<b>ACEP familiarity</b>							
Somewhat familiar	17 (47.2)		31 (66.0)		21 (88.0)		
<b>Part III of knowledge assessment</b>							
<b>Perceived cause</b>							
	Mean ( $\pm$ SD)		Mean ( $\pm$ SD)		Mean ( $\pm$ SD)		
Pain	8.0 ( $\pm$ 2.2)		8.0 ( $\pm$ 2.0)		8.3 ( $\pm$ 2.0)		.509
Undiagnosed HTN	7.0 ( $\pm$ 2.0)		6.9 ( $\pm$ 2.0)		6.7 ( $\pm$ 2.4)		.878
Uncontrolled HTN	7.5 ( $\pm$ 1.9)		7.0 ( $\pm$ 2.1)		7.8 ( $\pm$ 2.2)		.052
Anxiety	6.8 ( $\pm$ 2.2)		6.9 ( $\pm$ 1.9)		7.6 ( $\pm$ 2.2)		.044
Inaccurate reading	5.1 ( $\pm$ 2.3)		4.9 ( $\pm$ 2.3)		5.0 ( $\pm$ 2.2)		.824
Inaccurate BP cuff size	5.3 ( $\pm$ 2.1)		5.3 ( $\pm$ 2.2)		5.9 ( $\pm$ 2.4)		.246
Abbreviations: ACEP, American College of Emergency Physicians; DBP, diastolic blood pressure; ED, emergency department; JNC 7, Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; MD, medical doctor; PA, physician assistant; RN, registered nurse; SBP, systolic blood pressure; SD, standard deviation.							

( $P<.001$ ). The majority of providers who were aware of the ACEP policy were somewhat familiar with it.

**Part III—Perceived Causes of Elevated BP.** No differences were found between provider type and perceived cause of elevated BP.

**Attitudes and External Factors.** Table III shows significant differences between provider type and self-reported barriers (provider attitudes and external factors [patient, guideline, and organizational factors] for the BFAI and additional items).

**Provider Factors (BFAI).** A significantly larger proportion of MDs (74.1%) and PAs (56.5%) wanted to know more about the ACEP policy prior to applying it, with RNs being least likely to report this as a barrier (42.9%) ( $P=.001$ ). A large proportion (87%) of ED providers did not report that lack of training was a barrier to providing preventive care. However, MDs (27.8%) were more likely to report that they did not have the training, compared with PAs (7.1%) and RNs (9.9%) ( $P=.001$ ).

**Additional Provider Factors.** On average, ED providers perceived that they had the skills (96.1%), knowledge (97.4%), and confidence (91.7%) to refer patients in the

ED with elevated BP, and did not report this as a barrier. Physicians (100%) were more likely to report that they had the skills needed for BP referrals, compared with PAs (98.8%) and RNs (91.2%) ( $P=.008$ ).

**Patient Factors (BFAI).** Difficulty in providing preventive care to those who seem healthy was not a barrier for the majority of ED providers (78.7%). However, RNs (30.8%) were more likely to report difficulty in providing care to those who seemed healthy, compared with PAs (18.3%) and MDs (9.3%) ( $P=.007$ ).

**Additional Patient Factors.** The majority of providers reported that patients were not aware of the health benefits of having their BP re-evaluated, with PAs (82.4%) more likely to report this as a barrier compared with MDs (63%) and RNs (71.4%) ( $P=.035$ ). In addition, PAs were more likely to report (26.8%) that patients doubted their concern for their BP when referred, compared with MDs (9.3%) and RNs (15.4%) ( $P=.023$ ), even though the majority of providers did not report this as a barrier. A significantly greater proportion of PAs (25.9%) compared with RNs (18.7%) and MDs (7.4%) reported that referring patients for BP re-evaluation caused them to feel emotionally or physically uncomfortable, even though the majority of providers did not report this as a barrier ( $P=.025$ ).

**Guideline Factors (BFAI).** Although very few ED providers (7.4%) reported that working according to the ACEP policy would be too time-consuming, a significantly greater proportion of MDs (13%) compared with PAs (9.4%) and RNs (2.2%) reported that time would be a barrier ( $P=.038$ ).

**Additional Guideline Factors.** One item was used to examine additional guideline characteristics; however, no significant differences between provider type were found.

**Organizational Factors (BFAI).** Although the majority of ED providers (75.7%) reported that financial compensation was not needed for BP referrals, RNs (33.3%) were more likely to report that they required financial compensation, compared with PAs (18.8%) and MDs (18.5%) ( $P=.048$ ).

**Additional Organizational Factors.** About half (52.8%) of providers reported that BP referral has not been formalized through a decision-making process and the other half (47.8%) reported that it has. MDs were more likely to report this as a barrier ( $P=.004$ ). RNs (71.4%) were more likely to report that referral is influenced by the opinion of the medical director, compared with MDs (31.5%) and PAs (31.8%), who reported the opposite ( $P<.001$ ).

## DISCUSSION

This was the first study to document provider differences of self-reported barriers to referral for elevated BP in the ED among a multidisciplinary and random sample of ED providers who belong to one of three professional ED organizations (AMA, SEMPA, or ENA) across the United States. This study achieved a 51% response rate. Together with previous studies, this

**TABLE III.** Self-Reported Attitudes and External Factors and Differences Between Provider Type

	MD, No. (%)	PA, No. (%)	RN, No. (%)	P Value
<b>Provider attitudes—BFAI</b>				
Knowledge, motivation				
Barrier	40 (74.1)	48 (56.5)	39 (42.9)	.001
Training/education				
Barrier	15 (27.8)	6 (7.1)	9 (9.9)	.001
Provider attitudes—additional skills needed				
Barrier	0 (0.0)	1 (1.2)	58 (8.8)	.008
<b>Patient factors—BFAI</b>				
Seem healthy/asymptomatic				
Barrier	5 (9.3)	16 (18.8)	28 (30.8)	.007
<b>Patient factors—additional items</b>				
Patient awareness				
Barrier	34 (63.0)	70 (82.4)	65 (71.4)	.035
Patient doubt				
Barrier	34 (63.0)	70 (82.4)	65 (71.4)	.023
Causing discomfort				
Barrier	4(7.4)	22(25.9)	17 (18.7)	.025
<b>Guideline factors—BFAI</b>				
Time investment				
Barrier	7 (13.0)	8 (9.4)	2 (2.2)	.038
<b>Organizational factors—BFAI</b>				
Reimbursement, insurance system				
Barrier	10 (18.5)	16 (18.8)	30 (33.3)	.048
<b>Organizational factors—additional items</b>				
Formalized ACEP policy				
Barrier	36 (66.7)	48 (65.6)	36 (39.6)	.004
Medical director influence				
Barrier	17 (31.5)	27 (31.8)	65 (71.4)	<.001
Abbreviations: ACEP, American College of Emergency Physicians; BFAI, Barriers and Facilitators to Assessment Instrument; MD, medical doctor; PA, physician assistant; RN, registered nurse.				

suggests that “response bias may not seriously affect these findings when perhaps more than a 50% response rate is achieved.”<sup>17</sup> However, only 36% of physicians responded to the survey. Responses by physicians differed in this study when compared with some studies also examining barriers to guideline or protocol adherence among ED providers. Only one study was found to specifically examine barriers to HTN screening and intervention among a multidisciplinary sample of ED providers. In that study, Tanabe and colleagues<sup>10</sup> found that a greater proportion of physicians (76% for attending physicians and 88% of resident physicians) responded to their study, compared with the results found in this current study. This study was conducted at the worksite, (five EDs), therefore decreasing the burden and time it would take to complete a mail survey. In contrast, however, a recent study examining barriers to implementation of a protocol for early detection and management of sepsis found that only 38% of physicians (16 of 57) responded to their 13-item questionnaire also administered at the worksite (one ED).<sup>15</sup> To increase the trustworthiness of these results, this study used recommendations to limit nonresponse bias,<sup>19</sup> a popular and “research-driven” conceptual framework, a multi-modal method, reminder letters, and a modest financial incentive (\$10).<sup>19</sup> However, in the current study, only a 36% response rate among physicians was achieved. While this response rate was low and may not best represent ED physicians, evidence suggests that response rates for mailed surveys to physicians have declined over the past decade<sup>17</sup> One reason for the decline in response rate over time is a result of the increasing demand to participate in research activities,<sup>18</sup> lack of time, “perceived salience,” in which the value of the study is perceived to be low or that there is concern about the confidentiality of the results, and that the individual questions appear biased.<sup>20</sup>

This study found few differences between provider type in terms of accurately defining HTN and the ACEP recommendations. RNs were least likely to correctly define pre-HTN and stage I HTN and a few reasons may be postulated. First, pre-HTN is a new classification introduced by the JNC 7. This designation was made as a result of the increasing amount of data associating adverse cardiovascular outcomes with what had previously been considered normal BP readings<sup>5,14</sup>; however, knowledge translation of this may be poor. It may also be that even though all disciplines learn *what* HTN is during training, continuing education for HTN may not be similar between disciplines.

Furthermore, this study found a greater proportion of MDs and PAs reported that they refer at least 75% of the time compared with RNs. One explanation for this may be because BP reassessments are thought of as a task usually performed by the RN rather than the physician (or mid-level provider), and, conversely, referrals are often thought of as a task usually performed by the physician (or mid-level provider), not the RN. However, given the simplicity of screening and referral procedures

and their potential benefit, it would be imprudent to say that it is one person’s job over the other.

In 2006, the ACEP published a clinical guideline recommending referral for all adult patients who have persistent asymptomatic HTN during their ED visit; however, RNs had more difficulty in performing preventive care to patients who were asymptomatic compared with MDs and PAs. Since HTN rarely produces clinical symptoms, interventions to address this barrier may be necessary, geared especially toward nurses since they referred the least and it is they who often do the discharge teaching.<sup>10</sup> Interestingly, PAs were more likely to report that referring patients to have their BP evaluated caused them to feel emotionally or physically uncomfortable. These findings are unclear since health promotion and disease prevention is often “priority for all PAs in daily practice.”<sup>21</sup>

Nonetheless, current clinical guidelines call for a multidisciplinary approach, such that all providers including nurses are encouraged to participate in HTN management.<sup>5,22</sup> Furthermore, while this guideline is “intended for physicians,”<sup>1</sup> it is not unexpected that MDs were more likely to be aware of the policy when compared with PAs and RNs. However, given the significant impact all clinicians can have on patients who have elevated BP and are referred, it is recommended that this policy be widely disseminated into EDs across the United States and across disciplines.

The majority of studies that have examined barriers to guideline adherence have been conducted in primary care and have found that time is a common barrier to adherence to guidelines. Similarly, studies conducted in the ED have also found time to be perceived as a barrier to implementing referrals for post-injury patients,<sup>23</sup> performing universal HIV screening,<sup>24</sup> substance abuse,<sup>25</sup> and mandatory domestic violence screening in the ED.<sup>26</sup> Tanabe and colleagues<sup>10</sup> found time to be a moderately important barrier to reassessing BP; however, time was not reported as a major barrier to reassessment/referral of patients with elevated BP for most providers in this study. Nevertheless, given the fast-paced nature of the ED environment, time may always be an underlying issue and may be one challenge to overcome, especially for physicians, in order to adhere to the recommendations by the ACEP.<sup>1,22</sup> According to Levy and colleagues,<sup>22</sup> one way to overcome the “time” issue is to experiment with “programmatic efficiencies, such as protocols and order-sets. . .” that. . .can offset competing priorities in the ED and combat clinical inertia.”

Studies examining barriers to guideline adherence, but not in the ED setting, have found that provider-reminder systems, local opinion leaders, computer decision support systems, and financial incentives are some strategies to successfully implement research findings.<sup>27,28</sup> Given the fact that nurses were more likely to report that they required financial reimbursement for the referral of patients highlights that this may be a strong incentive for successful guideline implementation and may be one

way to improve performance.<sup>29</sup> Similar findings were found by Haagan and colleagues<sup>30</sup> in physicians. They found that 57% of physicians reported that they required financial compensation for adhering to a fertility guideline. In a qualitative study conducted by Yakasaki and Komatsu,<sup>29</sup> nurses reported that “administrators would implement guidelines if costs were reimbursed” and that “if . . . work specified by the guidelines is reimbursed, we will get serious about the guidelines.”

### Study Limitations and Strengths

The results of this study must be interpreted in light of limitations regarding availability of measures and response rate, especially of MDs. This study collected information by self-report and providers may have reported “socially acceptable” responses when completing the questionnaire, which may result in under-reporting of barriers. Furthermore, a 36% response rate from physicians limits the ability to generalize. Nevertheless, this study has considerable strengths. Although we report cross-sectional data, and despite obtaining only a 51% response rate, this was the first study that attempted to use a random, multidisciplinary sample of ED providers across the United States. The information obtained from this approach may serve as a basis for the successful implementation of multidisciplinary interventions that address referral for elevated BP in the ED.

### CONCLUSIONS

Given the adverse effects of asymptomatic HTN and the simplicity of intervening when a patient has elevated BP, a guideline was published in 2006 by the ACEP that recommends all adults with persistent HTN be referred for evaluation; however, provider adherence is poor. To understand why, this study examined differences between provider type and self-reported barriers to referral. We found that providers differ significantly in terms of knowledge, attitudes, and external factors, but not for referral. Therefore, recommendations are multifaceted and any multidisciplinary intervention to improve referral rates should address issues that may be disciplinary specific because all ED healthcare providers have the potential to reduce adverse outcomes caused by elevated BP.

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