

Medical News & Perspectives

Medical Students Fall Short on Blood Pressure Check Challenge

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A third of US adults have hypertension, a major risk factor for heart disease, which is the leading cause of death in the country. Additionally, more than a quarter of the population has higher than normal blood pressure (BP), or prehypertension. With stats like that, one might assume checking BP would be at the top of the list of medical student proficiencies. Yet a recent report suggests otherwise. Only 1 out of 159 medical students correctly performed all 11 elements in a BP check challenge with simulated patients, and the average number of steps performed properly was an abysmal 4.1.

The challenge was based on the current American Heart Association recommendations for BP measurement. Some parts of the challenge, which focused on prepping the patient, were more likely to be performed than others. More than half of the students correctly placed the cuff over a bare arm, used the correct cuff size, supported the arm, asked patients not to talk during the measurement, and had patients uncross their legs.

Far fewer than half of the students, however, correctly performed the other tasks: making sure the patients' feet were flat on

the ground, asking patients not to use their cell phones or read during the measurement, checking BP in both arms, noting the arm with the higher reading, and correctly answering which arm should be used for future measurements.

The students did particularly poorly when it came to having patients rest for 5 minutes in a chair before the measurement: Only 11 students performed this step, which helps to ensure BP is not elevated from activity.

"Obviously there are some limitations to this study in that this was a small sample of medical students and this was with a simulated patient, but nevertheless, I think the data are important and are striking," said Jeffrey T. Kuvin, MD, chief of cardiovascular medicine at Dartmouth-Hitchcock Medical Center, who was not involved with the research. "[T]he medical students...indicated that indeed they were falling well below what we would expect in terms of basic clinical competency in terms of how to measure a proper blood pressure."

A Vital Skill

The students in the study were attending the American Medical Association (AMA) House

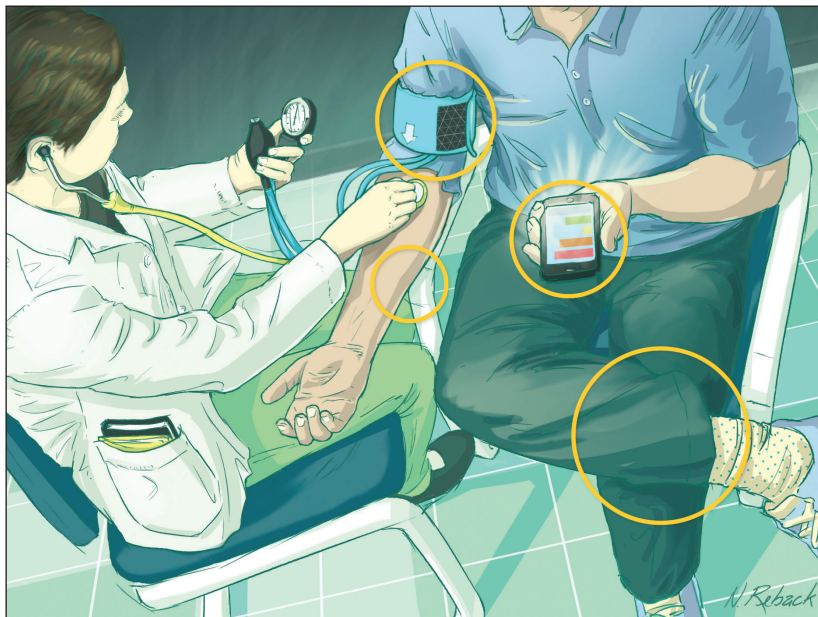
of Delegates annual meeting in 2015 when they took the challenge. They represented medical schools in 37 states, which according to study coauthor Raymond R. Townsend, MD, suggests a widespread problem.

Townsend is director of the hypertension program at the Hospital of the University of Pennsylvania. He wasn't surprised that the students bombed the voluntary test: "I used to have a standing challenge on rounds at Penn: 'If you can do a blood pressure correctly in my presence, I will buy you a dinner [at a] restaurant of your choice in Philadelphia.' After 10 years, not a single person—resident, fellow, or student—ever could do it."

Whether a medical student can properly measure blood pressure has implications down the line. Although most physicians don't typically screen for BP themselves, they'll frequently recheck an elevated measurement taken by a nurse or medical assistant and use their own reading as the "treatment BP," according to Michael K. Rakotz, MD, lead author of the study and vice president of chronic disease prevention and management at the AMA.

Many physicians also recheck BPs of patients with an indication like chest pains or a history of high blood pressure or diabetes, said Susan Thompson Hingle, MD, a professor of clinical medicine in the Southern Illinois University School of Medicine and chair of the American College of Physicians' Board of Regents. Townsend pointed out that many hypertension specialists such as himself take their own BPs. Physicians may also be called upon to measure blood pressure as a first responder in an emergency situation or at the bedside of a critically ill patient.

Getting the reading right is, quite literally, vital. "Blood pressure is an incredibly powerful indicator of cardiovascular health," Kuvin said. "We know that elevated blood pressure is linked to a number of critical, chronic disease states including heart disease, neurovascular disease, [and] kidney disease and therefore, accurate assessment of blood pressure and treating to our present guidelines is paramount."



Improper technique affects blood pressure readings. Studies show that crossing the legs, for example, raises systolic pressure by 3 to 8 mm Hg and incorrect arm placement raises both systolic and diastolic pressure by 10 mm Hg or more—enough to push a patient's diagnosis from prehypertensive to hypertensive.

Inaccurate readings can therefore cause errors in treatment. "Really important clinical decisions are made based on those blood pressures," Hingle said. A mistakenly low reading can lead to undertreatment, which can allow an undiagnosed condition to escalate, while an incorrect high BP can cause overtreatment with blood pressure-lowering medications.

Faulty BP measurements usually lead to the latter scenario, and "once someone gets started on a medication for blood pressure, very very rarely is the physician going to be willing to take them off of it," Hingle said. "The risks of stopping the blood pressure medication are really high."

A Need for Education and Assessment

Townsend believes 2 main factors underlie the problem. "Number one, people think that you can wrap a cuff on someone's arm, push a button or squeeze a ball, and get a number. The problem is that if you really want the right number, you gotta pay a little more attention to it."

The second factor: A lack of oversight. Townsend wants to see better training and competency testing in medical schools, as well as retraining and maintenance testing for physicians, especially those in primary care and internal medicine.

Kuvin, who chairs the American College of Cardiology's (ACC's) Lifelong Learn-

ing Oversight Committee, agrees. "Just like we trust airline pilots learn and maintain their competency, I think we as consumers of health care need to make sure that our physicians learn and maintain their level of competency as well."

Kuvin is concerned that poor BP readings may be just the tip of the iceberg. "If we're not doing a great job in terms of teaching the basics of blood pressure measurement, how are we doing in other basic physical examination teaching, such as heart sounds or evaluation of other physical findings?"

In fact, the ACC has recently developed clinical competencies for cardiovascular trainees as well as cardiologists, which include aspects of the cardiovascular physical examination. How these competencies will be tested going forward has yet to be determined, Kuvin said.

Some medical schools have already implemented clinical competency examinations that students must pass prior to graduation, according to Alison J. Whelan, MD, chief medical education officer at the Association of American Medical Colleges (AAMC). Other schools have "intern boot camps," an intensive clinical skills refresher course in the spring of the final year of medical school. "While not every 'boot camp' includes blood pressure measurement, the results of this study suggest that could be a worthwhile, simple addition to such programs," Whelan said in an email.

The AAMC also helped develop the Core Entrustable Professional Activities (EPAs) for entering residency—13 activities every medical student should be competent to perform independently when beginning residency, which include physical examination

skills. "Since the publication of the core EPAs for entering residency, the AAMC has supported ten medical schools that are developing tools and curricula to teach and assess competence for each of the EPAs," Whelan said.

The Hidden Curriculum

Not everyone agrees that better curricula and assessment is the answer. Hingle argues that medical students may learn how to measure blood pressure correctly in class, but then may pick up contrasting lessons during early clinical exposures.

"[In] most medical schools, they start seeing patients the first year," she said. "They go into the clinics, they go into the emergency room, they go into these different clinical environments, and what they see happen is very different than what they're taught."

Medical students may simply model the shortcuts they see physicians taking, and those practices, Hingle says, are driven by the harried clinical environment created by a volume-based health care system. "The expectation that you see a patient in 10 or 15 minutes, that's what needs to change," she said.

While Kuvin agrees that making time for proper blood pressure readings can be a challenge, he said it's incumbent on individual physicians to make sure that they are both modeling and learning proper behavior. "I think we need to make decisions as to what we value and what we think are important aspects of the physical examination, those that perhaps may require more time and effort." ■

Note: The print version excludes source references. Please go online to jama.com.