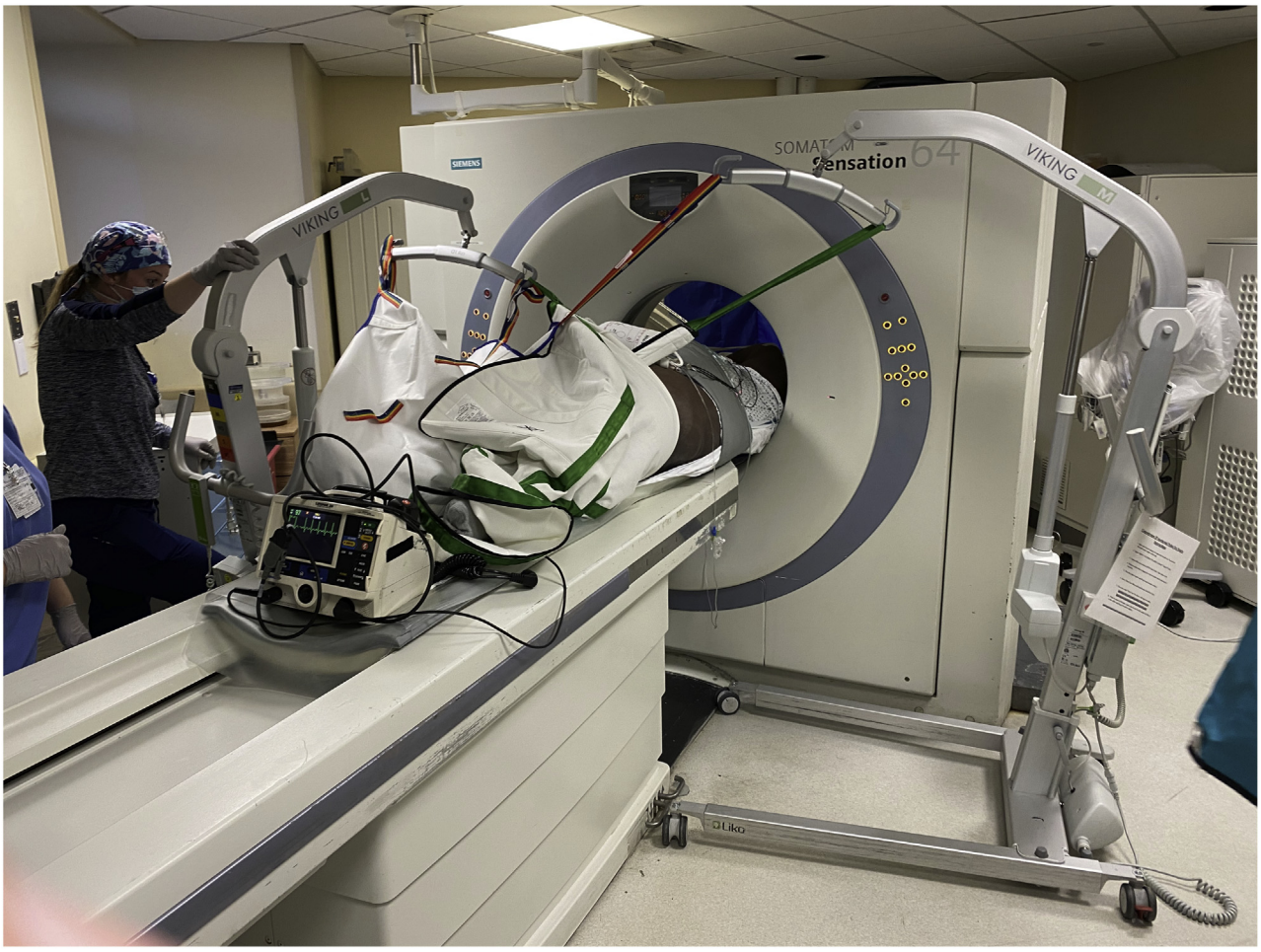

Figure 1. Patient in computed tomography scanner with legs suspended in Hoyer lifts.

Kelly Leidy, RN
Department of Emergency Medicine, Virtua Our Lady of Lourdes Hospital, Voorhees, NJ

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Persistent Racial/Ethnic Disparities in Out-of-Hospital Cardiac Arrest

To the Editor:

Successful resuscitation of out-of-hospital cardiac arrests is one of the most pressing issues within the resuscitation field. In many communities, emergency medical services (EMS) are the first professional responders to out-of-hospital cardiac arrests, and their effectiveness greatly affects cardiac arrest survival.[1] Despite the importance of EMS in ensuring survival in out-of-hospital cardiac arrest, many have documented significant variability in EMS system protocols and performance.[2] Another key factor that has been shown to dramatically improve outcomes in out-of-hospital cardiac arrest is the initiation of pre-EMS cardiopulmonary resuscitation (CPR) by bystanders, which improves circulation and perfusion during periods of cardiac inactivity.[3] A significant body of prior research has outlined the existence of racial/ethnic disparities in pre-EMS CPR and cardiac arrest survival rates.[4,5]

To understand the magnitude of current racial/ethnic disparities in the cardiac arrest survival rate, we examined Version 3 of the National Emergency Medical Services Information System (NEMSIS), a database containing

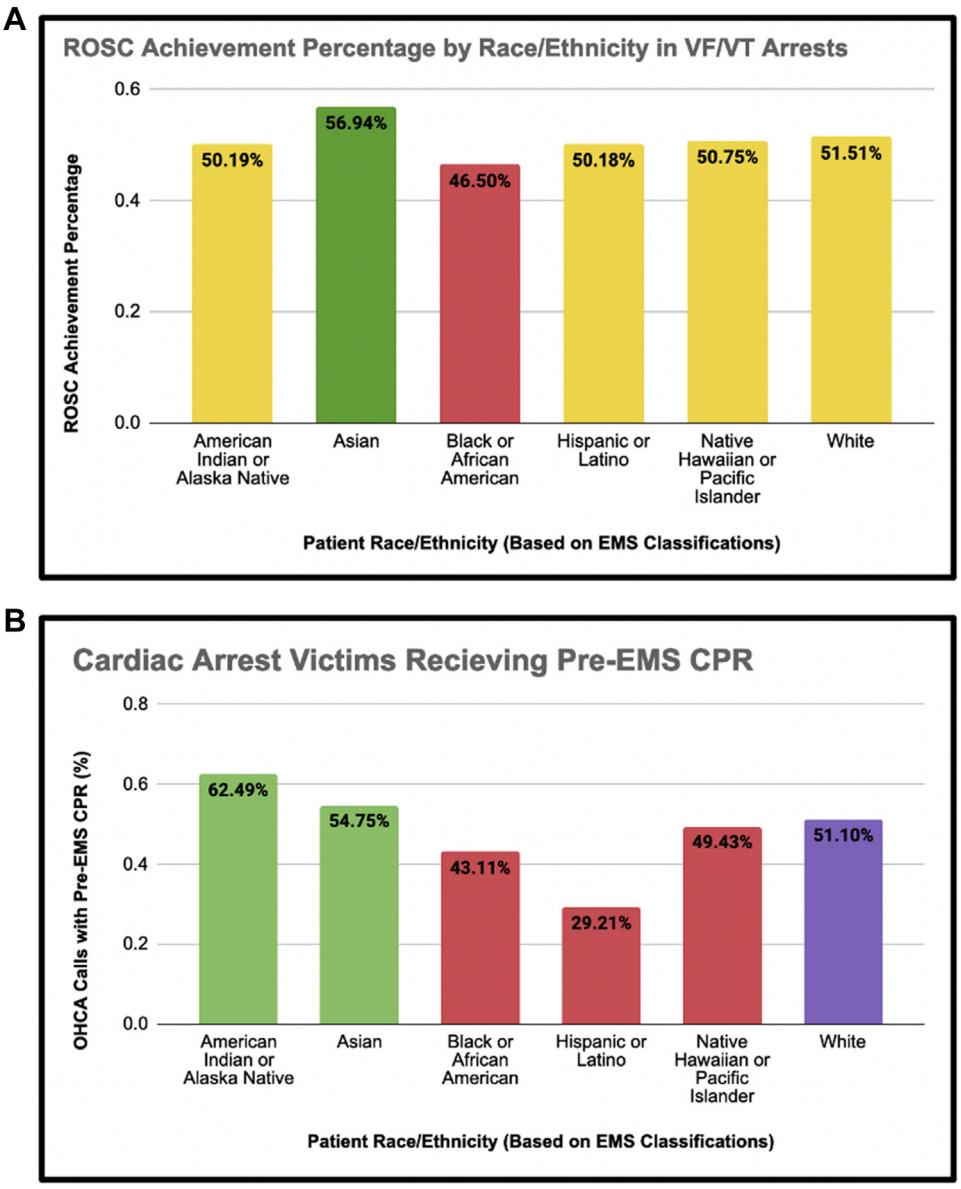

Figure. A: For out-of-hospital cardiac arrests involving ventricular fibrillation/ventricular tachycardia, Asian victims were significantly more likely to achieve ROSC ($P<.005$), whereas Black or African American patients were significantly less likely to achieve ROSC ($P<.0001$). The difference in ROSC achievement between white victims and Hispanic or Latino victims was approaching significance ($P=.129$). B: Examining whether CPR had been initiated prior to EMS arrival revealed significant disparities between racial/ethnic groups. *ROSC,* return of spontaneous circulation; *VF,* ventricular fibrillation; *VT,* ventricular tachycardia.

millions of EMS runs. Inclusion criteria were cardiac arrest calls involving a first monitored arrest rhythm of either ventricular fibrillation or ventricular tachycardia, where providers documented the patient's race/ethnicity and whether or not any return of spontaneous circulation (ROSC) was achieved. To understand if racial/ethnic disparities persist in pre-EMS bystander CPR, we also examined cardiac arrest calls (any presenting rhythm) within NEMSIS where providers documented the patient's race/ethnicity and whether or not CPR was initiated prior to EMS arrival.

There were a total of 33,925 ventricular fibrillation/ventricular tachycardia calls that met the inclusion criteria (2017 to 2019), and there were significant differences in ROSC achievement based on race/ethnicity (Figure). Asian victims were significantly more likely to achieve ROSC

(56.9%, $P<.005$), while it was significantly less likely for Black or African American victims to achieve ROSC (46.5%, $P<.0001$). There were also significant racial/ethnic disparities in the prevalence of pre-EMS CPR. For instance, victims who were Black or African American, Native Hawaiian or Pacific Islander, and Hispanic or Latino were less likely to receive pre-EMS CPR.

These data suggest that troubling racial/ethnic disparities persist in the resuscitation of out-of-hospital cardiac arrests. There are multiple possible explanations for these disparities. Unequal rates of bystander CPR could reflect unequal access to CPR training and a lack of CPR-trained individuals available to cardiac arrest victims of specific racial/ethnic demographic communities. The decreased rates of ROSC achievement among specific racial/ethnic groups could stem from differences in the severity of the underlying disease inducing the cardiac arrest. Disparities in resuscitation quality factors, such as low rates of pre-EMS CPR or suboptimal EMS performance, may also contribute to disparities in ROSC. Further studies should examine whether similar disparities continue to be present within single EMS systems, and efforts should be urgently directed toward increasing the prevalence of community members willing and able to perform CPR and toward reducing disparities in EMS system performance.

Aditya C. Shekhar,
The University of Minnesota
Minneapolis, MN
The University of Chicago
Chicago, IL

Christopher Mercer, DC, APA-C
The National Registry of Emergency Medical Technicians
Columbus, OH

Robert Ball, MBA, NRP
The University of Minnesota
Minneapolis, MN

Ira Blumen, MD
The University of Chicago
Chicago, IL

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1. Hazinski MF, Nolan JP, Aickin R, et al. Part 1: executive summary: 2015 international consensus on cardiopulmonary resuscitation and emergency cardiovascular care science with treatment recommendations. *Circulation*. 2015;132(Suppl 1):S2-S39.
2. Govindarajan P, Lin L, Landman A, et al. Practice variability among the EMS systems participating in Cardiac Arrest Registry to Enhance Survival (CARES). *Resuscitation*. 2012;83:76-80.
3. Ritter G, Wolfe RA, Goldstein S, et al. The effect of bystander CPR on survival of out-of-hospital cardiac arrest victims. *Am Heart J*. 1985;110:932-937.
4. Becker LB, Han BH, Meyer PM, et al. Racial differences in the incidence of cardiac arrest and subsequent survival. *N Engl J Med*. 1993;329:600-606.
5. Shekhar A, Mercer C, Ball R. Race might be a predictor of return of spontaneous circulation in cardiac arrest: lessons from the NEMSIS database. *J Am Coll Cardiol*. 2020;75(Suppl 1):3587.