Disparities in Emergency Care
An Information Paper

Introduction

The Public Health and Injury Prevention Committee was assigned an objective to "*Compile and distribute information on health care disparities and strategies to address the disparities.*" The topic of health care disparities is a broad one that engendered considerable discussion. The subcommittee reviewed the literature and focused its efforts on four aspects of potential disparities in the provision of emergency care:

1. *Disparities in Practice*: differences in the way that providers practice based on ethnic, racial or cultural factors that cannot be otherwise accounted for.

2. *Disparities in Pre-Hospital Care*: Geographic and ethnographic differences in the provision of EMS services.

3. *Disparities in Utilization*: differences in the way that sub-populations utilize emergency services, and how these patterns may change with time.

4. *Disparities in Outcomes*: difference in clinical outcomes for members of different ethnic groups that cannot be explained by other factors.

What follows is a summary of preliminary findings based on an informal review of the literature.

Disparities in Practice

A small but growing body of literature examines the role that bias plays in medical practice.[1,2] Some have expressed concerns that the necessity to make decisions rapidly in an information-poor environment makes emergency care particularly vulnerable to the pitfalls of bias.[3]

One study examining the care of a Native American population concluded that ED providers seemed to have a bias in favor of non-Hispanic whites compared with Native Americans, though the authors concluded that additional studies are needed to determine whether or not perceived bias in this setting influences outcomes.[4] A study examining disparities in the triaging of pediatric ED patients concluded that black, Hispanic, and Native American patients received lower acuity triage scores than whites when presenting with subjective complaints such as breathing difficulty, abdominal pain, and fever. These differences did not exist for objective complaints such as lacerations, etc.[5] Others have documented differences in the predilection to prescribe pain medication, attributable in part to racial factors[6] or socioeconomic status.[7]

To reduce bias as a cause of variation in clinical practice, some have proposed efforts to increase the cultural competency of individual providers, as well as measures to diversify the ED workforce as a whole.[8] The teaching of cultural competency to emergency medicine trainees has become an active area of academic

inquiry.[9] The use of quality improvement methods and increased epidemiologic, clinical and services research to reveal individual and institutional disparities in performance have been emphasized, as well.[3]

A promising strategy with the potential to counter bias is the increased use of standardized clinical decision tools. In an inpatient setting, one study showed that implementing a standardized approach to risk stratification eliminated differences in the care of patients at risk for venous thromboembolism.[10]A pediatric emergency department (ED) based study examining decreased odds of diagnostic testing for minority groups found that the discrepancies appeared larger for conditions lacking established treatment protocols.[11]

Disparities in Pre-Hospital Care

Challenges and resources available to EMS systems vary across the country.[12,13] Inner city and suburban communities face different constraints than rural areas, where prolonged response times are a major obstacle.[14] While patient outcomes in the rural west are likely worsened by the necessity of covering additional mileage,[15] the EMS response in an old high-rise can be complicated by factors such as the need to get a patient down a narrow flight of stairs.

Bystander response is a critical component of survival in cardiac arrest or acute hemorrhage. Unfortunately, rates of bystander response are lower in poor and predominately black urban neighborhoods.[16] In rural areas, rates of bystander support are higher regardless of race. Public health authorities should consider targeting interventions, such as the bystander response program for hemorrhage control, Stop the Bleed, advocated by FEMA and Homeland Security[17]using geographic data to focus the training on those communities with the lowest response rates.[18] Coordinated efforts like these may serve as community-building activities that improve social bonds and help to overcome the psychological barriers associated with helping in an emergency.

Local and regional financial support for EMS systems varies significantly due to differences in taxation and billing practices.[19] These fiscal considerations are compounded by legacy systems which can cause significant disparities in the quality of EMS services between communities that are otherwise demographically similar. For example, the bypassing of cardiac catheterization-capable facilities associated with ED crowding has been linked to decreased re-vascularization rates and a 9.8% relative increase in one-year mortality in California.[20]

Unfortunately, financial factors remain the largest barrier to uniform EMS implementation. EMS sits at the intersection of health care, public safety and public health, and although the initial stabilization and transport is influenced by all sectors, the *benefits* of improvements in EMS optimization may accrue to a different sector than the one that paid for the improvement.[21]

In general, reimbursements from government or private insurance do not come close to matching the real cost of operating a robust EMS system. Air ambulance systems have been shown to be cost-effective for patients suffering certain serious traumatic injuries, but not with all patients;[22] an increased emphasis on condition selection will help keep the system sustainable.

Many EMS data collection systems are incomplete, although there has been a significant effort to standardize and rapidly integrate data reports in the form of the National EMS Information System, NEMSIS 3.[19] Sustainable improvements towards addressing disparities requires detailed data collection of inter-agency, interstate and even international comparisons. NEMSIS was conceived in 2001 by the National Association of EMS Directors.[23] While approximately 80% of the 37 million 911-dispatched ground transports yearly are collected in NEMSIS, only about 50% of air medical transports submit records, and records of inter-hospital transports are similarly incomplete. Continued federal support for universal implementation of NEMSIS 3 will improve data quality and allow proper benchmarking. This will, no doubt, facilitate future research addressing disparities in pre-hospital care.

The advent of telemedicine represents an opportunity to address some disparities in pre-hospital care. An intervention as simple as the transmission of pre-hospital EKGs can improve door-to-balloon time, and a recently published cost-benefit analysis of telehealth in pre-hospital care showed a 6.7% absolute reduction in potentially medically unnecessary ED visits.[24] These technologies have the potential to directly address the apparent "knowledge disparity" between rural and urban providers. The creators of a virtual "community of practice" that allowed for information sharing between physicians providing emergency care for children reported that the intervention successfully reduced variations in rural and urban practice and enhanced patient outcomes in pediatric emergencies.[25]

Technology has the potential to overcome a variety of factors that contribute to disparities in pre-hospital care. Data-driven recommendations by the American College of Surgeons regarding the distribution of helicopters and trauma centers are helping to optimize the use of limited resources and informing otherwise intense political discussions.[26] Future improvements may include the pre-positioning of ambulances based on smart dispatch systems that anticipate calls based on algorithms that consider weather, time of day, day of the week, special events, etc. Automatically dispatched and relatively affordable drones delivering emergency supplies such as AEDs[27] to lay first responders may someday be integrated into EMS systems. Unmanned aerial drones currently under development by the military to evacuate troops from the battlefield may someday also find application in civilian EMS systems, significantly reducing costs and response times in remote areas.

Disparities in Utilization

ED volumes have been increasing for decades, exceeding what would be expected from population growth. While there is as an association between primary care shortages and ED visits, there are regional and ethnographic disparities in ED utilization.[28] For example, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont have high ED visit densities in spite of the presence of robust primary care resources, whereas Arizona, Idaho, Montana, New Mexico, and South Dakota have low ED visit densities despite high primary care shortages.[29] Even within a small geographic area, ED utilization may vary greatly by neighborhood characteristics.[30] Areas with large numbers of patients requiring translation services have an attendant increase in ED visits.[31-33]

Limited access to care is associated with increased ED use,[34] and some ED visits are attributable to poor disease management.[35] However, a recent analysis of ED utilization after Massachusetts health reform confirms that access to health insurance is only one of a multitude of factors affecting utilization of the

ED.[36] Some interventions aimed at improving primary care access are effective in reducing ED use, but other interventions aimed at decreasing utilization have shown contradictory results,[37] and some have actually had the effect of increasing ED use.[38,39] After adjusting for other factors, Medicaid or Medicare patients have much higher ED utilization rates than expected compared to patients with private insurance,[40-42] and the odds of a visit being non-urgent are higher for patients using public insurance versus private.[43,44]

Differences in ED utilization appear, in part, to be a function of differences in education,[32,45-49] health literacy,[50-52] and learned behavior. Increased parental ED utilization has been associated with increased ED utilization by offspring.[53,54] Proximity and involvement of a grandmother appears to be a factor in ED utilization as well, reinforcing the notion that patterns of ED are multigenerational.[55] The convenience of physical proximity is a factor that has the potential to confound this effect (ie, children living near a hospital are more likely to be brought to the ED.)[56-58]

There are racial disparities in ED utilization rates that are not attributable to differences in insurance status, access to care, or health literacy. In a few contexts, whites are higher utilizers, while in other settings various minority populations are overrepresented.[32,39,43,48,50,59-68] The issue is further confused by the fact that some of the increases in ED volume reflect societal trends with the potential for disparate racial impact, e.g. drug use and abuse[69], poisonings[70], growing mental health issues[71] and the increase in single parent households.[27]

Relative ED utilization by gender appears to have changed with time. Studies done in the 1970s found that men were the heaviest users of emergency services.[72,73] More recent investigations suggest that that trend has reversed, with females being more likely to use the ED.[47,48,60,66,74-78] This apparent reversal may support study findings that women are more likely to have non-urgent complaints.[79-81]

Disparities in Outcomes

The available literature on disparities in health care outcomes focuses on three broad categories: race, gender, and socioeconomic status (SES). While these disparities are plausible and in some studies significant, this research is often confounded by variables that are difficult to address methodologically. For example, while some researchers clearly find race an independent predictor of clinical outcomes, other investigators find that such racial disparities disappear when other factors, such as the facility where care is received, are carefully controlled for. Isolating disparities in outcomes attributable solely to emergency medicine-related factors adds additional complexity, and good literature on the subject is sparse.

A recent meta-analysis suggested that in the setting of trauma, race and insurance status had an impact on mortality, with uninsured patients being less likely to receive diagnostic imaging or surgery. Other investigators have observed that hospitals that serve minority populations have a higher mortality than facilities that treat a predominantly white population; initial treatment upon presentation to the ED was a specific concern of the investigators. However, an analysis of the National Hospital Ambulatory Medical Care Survey suggested that initial trauma assessment and management in the ED are similar across all races.

Investigators have documented an association between race and increased mortality from stroke, and others have observed that minority patients are less likely to receive thrombolytics than white patients. Some of

this disparity is attributable to delays in presentation, but how much is unclear. In one study, Hispanic patients presented later to primary stroke centers than white and black patients—but despite similar presentation times, black patients were less likely to receive tPA than white patients. While presentation times were comparable for both groups, a similar investigation found that black patients in Washington, D.C. tended to present later for stroke than white patients.

Gender differences in ED presentation and subsequent testing for acute coronary syndromes has been well documented. Recent literature suggests that this disparity has improved, at least with regards to time to EKG and CTA testing.

Recommendations to Address Disparities in Emergency Care

Note: these recommendations are, of necessity, provisional. Producing definitive evidence-based recommendations on this topic would require a formal literature review addressing a precisely defined set of questions.

1. Promote the evidence-based teaching of cultural competency.
2. Emphasize the use of clinical decision tools that standardize the approach to risk stratification and potentially reduce subjective bias.
3. Support targeted education programs that serve communities known to have poorer rates of bystander response.
4. Explore initiatives that address the "knowledge disparity" between rural and urban providers of emergency services, including providers who do not have post-graduate training in emergency medicine.
5. Continue support for universal implementation of NEMSIS 3, in order to facilitate research addressing disparities in EMS coverage and care.
6. Facilitate research into the causes of disproportionate increases in ED utilization among sub-populations that cannot be explained by other factors such as insurance, socioeconomic status, primary care access, etc.
7. Promote targeted health literacy programs that have the potential to reduce the overuse of emergency services.

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