

# UC San Diego

## UC San Diego Previously Published Works

### Title

Editorial: Ambulance Diversion: the Con Perspective

### Permalink

<https://escholarship.org/uc/item/0bd8s91z>

### Journal

The American Journal of Emergency Medicine, 33(6)

### ISSN

0735-6757

### Authors

Nakajima, Yuko

Vilke, Gary M

### Publication Date

2015-06-01

### DOI

10.1016/j.ajem.2015.03.005

Peer reviewed



Contents lists available at ScienceDirect

## American Journal of Emergency Medicine

journal homepage: [www.elsevier.com/locate/ajem](http://www.elsevier.com/locate/ajem)

## Controversies

## Editorial: Ambulance Diversion: the Con Perspective

Yuko Nakajima, MD\*, Gary M. Vilke, MD

Department of Emergency Medicine, UC San Diego Health System, 200 West Arbor Dr #8676 San Diego, 92103

As the ultimate safety net, emergency departments (EDs) are expected to care for any patient, at any time, under any circumstances. When EDs are overwhelmed in periods of surge, one solution is to redistribute patients. A commonly used method for redistributing patients is ambulance diversion. Ambulance diversion is not a new phenomenon and, over time, has become commonly used by EDs to address the growing problem of ED overcrowding and saturation [1]. As ED visits have increased through the years, ambulance diversion has evolved into standard practice in many health systems. Along with this, ambulance diversion has always involved controversy over whether, overall, it is beneficial or detrimental to the patient, emergency medical services (EMS) systems, and hospitals.

In some circumstances, EDs and hospitals may occasionally be overwhelmed and may not be able to provide optimal patient care. Diversion may be viewed as a necessary mechanism to avoid the standard situations in the ED represented by crowding, boarding, and hallway beds. It is used as a way to direct patients away from one's hospital when waiting rooms are crowded and ED beds are full. However, in many circumstances, the patient is being directed to another facility that is just as busy and impacted but now further away, keeping patients in the back of ambulances longer and thus keeping ambulances out of service for longer periods of time. Ambulances being out of service have been associated with delays in response to the next emergency because there are fewer units in service and the available ambulances have to travel further to reach patients. These delays have also attributed to adverse medical outcomes.

Recent data support that ambulance diversion does not work to ease ED overcrowding and may result in the worsening of patient care. Studies have shown that ambulance diversion can lead to delays for patients in obtaining definitive medical care given the increased field time and transport time and distances [2,3] leading to adverse outcomes including death. Diversion increases traffic accident risks and may malposition EMS resources. In addition, some patients may require specialty resources only available at the requested hospital and may not be able to receive them at an alternate destination.

There is a possible association between ED diversion and increased mortality in certain populations of patients, such as trauma and acute myocardial infarction patients [4,5]. Studies like these led to American College of Emergency Physicians forming an EMS taskforce to review the topic of ambulance diversion. The taskforce penned a position paper that stated, "Ambulance diversion should occur only after the hospital has exhausted all internal mechanisms to avert a diversion, which includes calling in overtime staff" [6]. The National Association of EMS Physicians also states that "... ambulance diversion has not been shown to improve ED patient throughput" [7].

It has been demonstrated that if one hospital goes into ED diversion status, an oscillatory phenomenon may occur, where the one hospital going on bypass causes a neighboring hospital to receive a disproportionate share of patients and is then forced to go onto bypass itself. This can create a domino effect impacting other hospitals nearby or, if there are no other hospitals to receive the patients, forcing the original hospital to accept more patients until it again gets impacted and goes back onto bypass. The cycle continues *ad infinitum* [8]. During this time of diversion, the hospital is receiving its own patients as well as patients who originally had requested another hospital as a destination. These patients will arrive to a hospital that does not have immediate access to medical records, study results, private physicians, and sometimes not even an inpatient bed being held for that patient for admission. Countless times, patients arrive to the "wrong" hospital because of diversion and have to be transferred back to the original requested destination for admission. And this transfer occurs after possibly an unnecessary workup and evaluation, as well as taking up valuable ED bed time to complete the evaluation, transfer call process, and wait-time for a transport team to remove the patient from the bed and transfer said patient to the hospital that they should have gone in the first place. Hours of physician, nursing, and administrative time are wasted. This does not even quantify the inconvenience and frustration to the patient and families.

In the end, the patients ultimately end up at the originally requested hospital, but not until after time and health care dollars are wasted. While this is happening at the receiving hospital, patients requesting said facility end up at the "wrong" hospital, thus creating the same inefficiencies there. And so the oscillating cycle continues, even leading to defensive ambulance diversion, where the second hospital, though not at saturation status, would go on diversion when hearing that the first hospital just went on diversion. After observing the oscillatory phenomenon, two hospitals that collaborated and committed to staying off ambulance diversion for a week were able to demonstrate that this oscillating effect goes away, patients get to the "right" hospital the first time, and still all of the patients get seen without any detriment to patient care [8].

Follow-up work quantified at a more regional level involving multiple hospitals working together to collectively stay off ambulance diversion demonstrated that this can be done safely with no reported adverse effects to patient care. All of the patients still get seen in the collective group of EDs, but the patients get to the correct hospital the first time [9]. This eliminates the ineffectiveness as described above for patients not being delivered to their requested medical home.

San Diego County took the success of these two regional short-trial successes to the next level in 2002. After ambulance diversion was

being abused to the point where all nineteen hospitals in the county would be on diversion simultaneously for hours at a time, a regional task force was formed to try to remedy this problem. It was noted that the EMS system operated most efficiently at two times: when no hospitals were on diversion and when all were on diversion because, operationally, this functioned as if all were off diversion. The task force created rules for the hospitals and implemented them, collectively reducing ambulance diversion hours from more than 4000 hours a month to about 1000 hours a month. But more importantly, the number of patients who requested a specific hospital but could not get there because of diversion went from an average of 1,320 a month down to 322; and no adverse events were reported [10].

This type of success has also been demonstrated in other large urban communities where diversion was eliminated altogether. Following a pilot study that concluded that diversion did not alleviate ED crowding, the state of Massachusetts eliminated diversion altogether in 2009. This resulted in reduced ambulance transportation times and ED length of stay [11].

A recent follow-up study in Boston showed positive findings with no negative impacts of the ban on diversion, including improved quality of care and improved relationships with institutions and EMS providers [12]. Several articles came from evaluating the effects of this ban. Rathlev et al [13] found no clinically significant changes in any ED group in mean monthly volume, admissions, elopements, or length of stay for any patient disposition group after implementation of the “No Diversion” moratorium. Burke et al [11] reported that the first statewide ambulance diversion ban in Massachusetts did not worsen ED crowding or ambulance availability and showed no increase in ED length of stay or ambulance turnaround time at Boston-area hospitals.

Emergency department crowding is a complex problem with multiple causes. It is clear that ambulance diversion alone has not and will not solve the problem. With the belief that ambulance diversion is a quick way to reduce hospital and ED overcrowding, many hospitals regularly use ambulance diversion. However, experts believe the practice does little if anything to reduce crowding; and research also suggests that diversion has negative patient care consequences. Leaving aside the patient care impact of diversion, many institutions have a financial interest in reducing ambulance diversion as this may result in annual revenue losses of millions of dollars [14–16]. In addition, ambulance diversion is only a temporary solution and really does not address the underlying causes of ED crowding that oftentimes result from a lack of inpatient capacity and other hospital-wide operational inefficiencies [17].

Overall, ambulance diversion does not work to ease ED crowding and at times may worsen patient care. There are many untoward negative effects of ambulance diversion that outweigh its transient positive effects. Hospitals should not rely on ambulance diversion as a demand control mechanism but instead should develop alternatives to address ED crowding, which have been proven to both be possible and effective.

## References

- [1] Lagoe RJ, Jastremski MS. Relieving overcrowded emergency departments through ambulance diversion. *Hosp Top* 1990;68(3):23–7.
- [2] Redelmeier DA, Blair PJ, Collins WE. No place to unload: a preliminary analysis of the prevalence, risk factors, and consequences of ambulance diversion. *Ann Emerg Med* 1994;23:43–7.
- [3] Neely KW, Norton RL, Young GP. The effect of hospital resource availability and ambulance diversions on the EMS system. *Prehosp Disaster Med* 1994;6:16–20.
- [4] Begley CE, Chang Y, Wood RC, Weltge A. Emergency department diversion and trauma mortality: evidence from Houston, Texas. *J Trauma* 2004;57(6):1260–5.
- [5] Shen YC, Hsia RY. Association between ambulance diversion and survival among patients with acute myocardial infarction. *JAMA* 2011;305(23):2440–7.
- [6] American College of Emergency Physicians policy statement: ambulance diversion. <http://www.acep.org/Clinical-Practice-Management/Ambulance-Diversion/>; 2012.
- [7] National Association of EMS Physicians Board of Directors. Ambulance diversion and emergency department offload delay. *Prehospital Emergency Care* 2011;15(4):543.
- [8] Vilke GM, Brown L, Skoqland P, et al. Approach to decreasing emergency department ambulance diversion hours. *J Emerg Med* 2004;26(2):189–92.
- [9] Khaleghi M, Loh A, Vroman D, et al. The effects of minimizing ambulance diversion hours on emergency departments. *J Emerg Med* 2007;33(2):155–9.
- [10] Vilke GM, Castillo EM, Metz MA, et al. Community trial to decrease ambulance diversion hours: the San Diego County Patient Destination Trial. *Ann Emerg Med* 2004;44(4):295–303.
- [11] Burke LG, Joyce N, Baker WE, et al. The effect of an ambulance diversion ban on emergency department length of stay and ambulance turnaround time. *Ann Emerg Med* 2013;61(3):303–11.
- [12] O’Keefe SD, Bibi S, Rubin-Smith JE, Feldman J. “No diversion”: a qualitative study of emergency medicine leaders in Boston, MA, and the effects of a statewide diversion ban policy. *Ann Emerg Med* 2014;63(5):589–97.
- [13] Rathlev NK, Blank F, Osborne B, et al. No diversion in Western Massachusetts. *J Emerg Med* 2013;44(2):313–20.
- [14] Falvo T, Grove L, Stachura R, et al. The financial impact of ambulance diversions and patient elopements. *Acad Emerg Med* 2007;14:58–62.
- [15] McConnell K, Richards C, Daya M, et al. The economic impact of ambulance diversions. *Acad Emerg Med* 2006;12(S):8–9.
- [16] Pham JC, Patel R, Millin MG, et al. The effects of ambulance diversion: a comprehensive review. *Academic Emergency Medicine*. 2006;13:1220–7.
- [17] Burke LG. Statewide ban on ambulance diversions reduces ambulance turnaround time and emergency department length of stay for patients admitted to the hospital. AHRQ Health Care Innovations Exchange. <https://innovations.ahrq.gov/profiles/statewide-ban-ambulance-diversions-reduces-ambulance-turnaround-time-and-emergency>.