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AMBULANCE DIVERSION AND EMERGENCY DEPARTMENT FLOW AT THE SAN FRANCISCO GENERAL HOSPITAL

Lesley Meng wrote this case under the supervision of Professor Gregory S. Zaric solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

The emergency department of any large hospital is frequently subject to substantial patient crowding, a result of arrivals by foot and ambulance, and limited resources. The San Francisco General Hospital (SFGH) is particularly crowded due to its prominence as the only trauma centre in the city. As a result, it is on ambulance diversion almost 25 per cent of the time, more than any other hospital in the area.

THE SAN FRANCISCO GENERAL HOSPITAL

The San Francisco Bay Area (the Bay Area) is the region that surrounds San Francisco in northern California. The region is made up of nine counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma. The three most prominent cities in the area are San Francisco, Oakland and San Jose. San Francisco is the fourth most populous city (and county) in California and is the cultural and financial centre of the metropolitan Bay Area. Oakland is the eighth largest city in California and is a major West Coast port, located on San Francisco Bay about eight miles (13 kilometres) east of San Francisco. San Jose, the third largest city in California, is located at the southern end of the county in the heart of Silicon Valley. Its location in the booming local technology industry area earned the city its nickname, the "Capital of Silicon Valley." In 2010, the total metropolitan population within the Bay Area was approximately 7.4 million residents.[1]

In 2010, SFGH was the only level-one trauma centre in San Francisco and one of two burn centres for the city and county. It was a teaching hospital affiliated academically with the University of California in San Francisco Medical School and was the only public hospital and trauma centre in the city and county. In San Francisco alone, there were 11 hospitals possessing emergency departments, with two of these hospitals located in south San Francisco, bordering San Mateo County (see Exhibit 1). Within the city, nine hospitals occupied the hilly terrain of San Francisco to serve the concentrated and growing urban population (see

[1] *United States Census Bureau, "Population and Housing Occupancy Status: 2010 – United States – Combined Statistical Area; and for Puerto Rico," 2010, http://www.census.gov/popest/data/national/totals/2012/index.html, accessed April 23, 2011.*

Exhibit 2). SFGH maintained a total of 686 licensed beds within the facility and experienced an annual emergency department (ED) volume of around 40,000 patients.[2] To satisfy this level of demand, the ED had a total of 36 to 40 beds depending on demand levels and space in the hallways.

HEALTH CARE IN THE UNITED STATES

In the United States, hospitals are differentiated primarily based on their status as a public or private institution, representing the primary source of their revenue, and key differences in cost structure and patient types. Doctors and hospitals are generally funded by payments from patients and insurance plans in return for medical services. Being a public hospital, SFGH receives significant funding from the local, state and federal governments. In addition, it may charge private insurers or government-issued social insurance programs for the care of patients. Government social insurance programs directly cover 27.8 per cent of the population,[3] including the elderly (Medicare), the disabled (Medicaid), children (The Children's Health Insurance Program), veterans (TRICARE) and some of the poor (Medicaid). Poor uninsured patients receive their care for free. In contrast, private hospitals operate on a for-profit basis and generally seek to offer care that will sustainably provide profitability for the hospital. They do not receive funding from the government and operate more like a corporation providing medical services to individuals who can pay for it. Non-profit hospitals fall in between the spectrum of private and public hospitals. They provide care for all patients with the goal to break even but do not receive direct funding from the government and therefore require payment. Exhibit 3 identifies the types of hospitals in the San Francisco area.

Despite these differences in payment structure and funding, the Emergency Medical Treatment and Active Labor Act requires all hospitals to accept all patients for emergency room care, regardless of their ability to pay. As a result of this act, patients are always assessed first and placed in the waiting room or seen prior to their insurance registration, so that no patient will be denied care in the ED on the basis of insurance status.

THE AMBULANCE DIVERSION ISSUE

Crowding within hospitals is a nationwide problem that results in long wait times for ED patients and the diversion of ambulances. However, this problem was particularly prevalent at SFGH, which was on ambulance diversion more frequently than any other hospital in San Francisco in 2010 (see Exhibit 4). ED crowding and ambulance diversion had been shown to lead to poor patient outcomes. Furthermore, solutions to hospital crowding and their financial implications for SFGH and surrounding hospitals were poorly understood.

Ambulance diversion is the process whereby ambulances are redirected to other hospitals because the primary target hospital ED is at full capacity. In the United States, approximately 45 per cent of all EDs reported that they were on diversion at some point in 2003.[4] Despite this prevalence, however, it is now understood that diversion is not an effective means for alleviating ED crowding.[5] When one hospital is

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[2] The SFGH ED had a total of 39,855 patients in 2009 and 40,115 patients in 2010; http://www.oshpd.ca.gov/, accessed April 23, 2011.

[3] U.S. Census Bureau, "Income, Poverty, and Health Insurance Coverage in the United States: 2007," August 2008. http://www.census.gov/prod/2008pubs/p60-235.pdf, accessed April 23, 2011.

[4] United States General Accounting Office, "Hospital Emergency Departments – Crowded Conditions Vary among Hospitals and Communities," March 2003, http://www.gao.gov/new.items/d03460.pdf, accessed April 23, 2011.

[5] J.C. Pham, R. Patel, M.G. Millin, et al., "The Effects of Ambulance Diversion: A Comprehensive Review," Academic Emergency Medicine 13.11, 2006, pp. 1220–27, accessed April 23, 2011.

overcrowded, others in the area are likely to be full as well, due to regional increases in demand for ED services. This may occur in winter months during flu season, on long weekends or for other reasons. Additionally, it has been shown that diversion of patients to other hospitals tends to increase the volume at surrounding hospitals, therefore increasing the probability that they go on diversion as well.

Ambulance diversion policies in the Bay Area are managed by the local emergency medical services (EMS) agency, with the following purposes:

1. To establish guidelines under which Receiving Hospital Emergency Departments divert ambulance patients when it has been determined, through pre-established criteria, that the hospital is unable to accommodate additional patients.
2. To define procedures for communicating changes in diversion status. To establish guidelines for ambulance provider operations when a Receiving Hospital is on diversion.
3. To define exceptions to the Ambulance Destination Policy when hospital(s) follow established procedures. [6]

There are three levels of ambulance diversion[7]:

1. Open
    a. Receiving hospitals are open when they are fully capable of receiving all patients who request that facility and/or would be transported to that facility according to the Ambulance Destination Policy.
2. Critical Care Diversion (CC Diversion)
    a. This status is usually due to a lack of staffed inpatient medical/surgical or critical care beds, or no available critical care beds in the ED.
    b. Cardiac, respiratory or traumatic arrest or post-arrest patients are exempt from the CC diversion policy and must be routed to the nearest hospital, despite it being on CC diversion.
3. Total Diversion
    a. This status is necessary when the ED has an overload of patients who require immediate attention and, therefore, would not be able to free staff or space should it receive an additional patient requiring immediate intervention.
    b. Cardiac, respiratory or traumatic arrest or post-arrest patients are exempt from the total diversion policy and must be routed to the nearest hospital, despite it being on total diversion.

When a hospital is not on diversion status, it is deemed "open" and operations continue as usual. The EMS agency has rules in place to regulate the prevalence of the number of hospitals on diversion at any given time. When four or more hospitals go on diversion at once, then diversion privileges are suspended for the whole city so that all hospitals are "open" to ambulance traffic again. However, since SFGH was the only trauma centre for the city in 2010, it never diverted trauma patients. Because of this rule, the SFGH could remain on diversion despite all other hospitals being forced "open." This was called "Trauma Override" status.

In determining the destination of the ambulance when the target hospital is on diversion, the Ambulance Destination Policy requires the consideration of the patient's condition, the patient's location, the patient's requested hospital in the case of medical/surgical transports, the capabilities of the nearest receiving hospital and the diversion status of the receiving hospitals.

[6] *http://www.emsa.ca.gov/local/SF.asp, accessed April 23, 2011*
[7] *Ibid.*