Study of West County Emergency Medical Services, Emergency Department, and Critical Care Access

Final Report

A report from:

The Abaris Group
Walnut Creek, CA

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Contra Costa EMS Agency
Study of West County ED and Critical Care Access/Capacity Issues
By The Abaris Group

Executive Summary

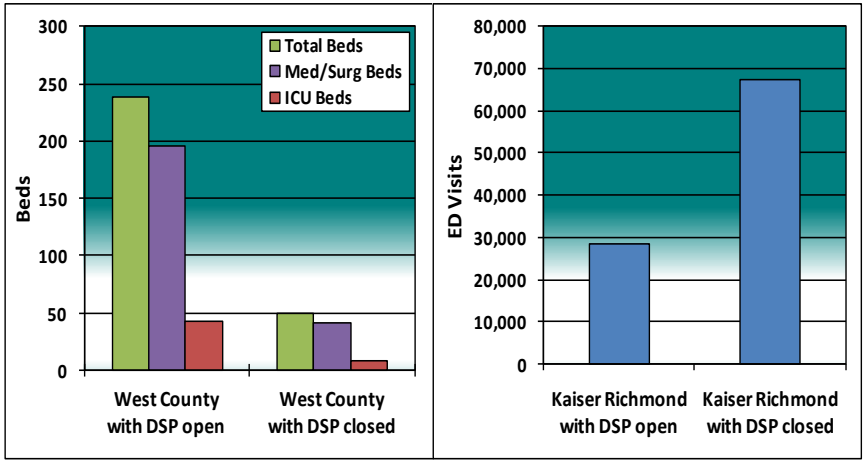
Overview

An audit released on June 14, 2011 identified significant financial concerns for the long-term sustainability of Doctors Medical Center San Pablo (DSP). The audit identified millions of dollars of operating losses over the past three years. This follows the medical center's bankruptcy, which was declared in 2006. During the bankruptcy period, the Emergency Department (ED) was closed to ambulance traffic for almost two months. Prior to July 2004, Tenet Healthcare Corporation operated the hospital on behalf of the West Contra Costa Healthcare District.

While the District is seeking to continue hospital services, the Contra Costa EMS Agency believes it prudent to undertake an analysis of the potential impact of a change of services or closure of the hospital on the provision of emergency care in the West County area. Thus, The Abaris Group has been asked to undertake an independent analysis of the impact of a potential closure of DSP.

Key Conclusions

1) The loss of DSP would be catastrophic to West Contra Costa County; it is one of only two hospitals in the region.
2) DSP represents 79 percent of the inpatient capacity in the region.
3) DSP provides 59 percent of the ED care in the region.
4) DSP receives 62 percent of the regional ambulance traffic.
5) The remaining West County hospital would be inundated by this patient volume shift as DSP patients would need to go somewhere.
6) The remaining hospital is part of Kaiser and the general public typically perceives it as unavailable to non-Kaiser members.
7) The region already does not have enough needed ED treatment stations or ICU beds even with DSP.
8) West County ED waiting times will likely reach 10-12 hours.
9) Additional ambulance hours needed to maintain current EMS performance would cost $2.5M annually.
10) Critical infrastructure would be eliminated to support a disaster.



Assessment

The Abaris Group conducted an assessment of the public demand for ED services in the West County and also a detailed inventory of ED and inpatient capacity in the region. It is The Abaris Group's opinion that the closing of the ED at DSP will have a substantial, negative effect on local health care providers and the public. While this effect will vary depending on the actual change that occurs and the location of alternative providers, it will disproportionately affect Kaiser Medical Center Richmond (Kaiser-Richmond). As an example, 9-1-1 ambulance traffic from the region would overwhelm Kaiser-Richmond's ED or require transporting patients to other EDs that would be further away, impacting ambulance availability within the county. This was the case in 2006 during the two-month ED closure when DSP filed for bankruptcy protection.

The full closure of the ED at DSP should be the biggest concern for the community and other healthcare providers in the region. In the event of such a closure, Kaiser-Richmond will experience 100 – 120 new ED patients per day on top of the 78 it already sees daily. That is an increase of at least 136 percent. While there are 12 other EDs in the region, Kaiser-Richmond will be disproportionately impacted. The reason for this is that patients typically choose the next closest ED for their ED needs, barring significant new healthcare resources in the community or an extensive public education campaign. Additionally, public education processes alone will not likely change a majority of the public's behaviors as they relate to selecting an ED. The resultant additional volume at Kaiser-Richmond will quickly overwhelm its small 15-bed ED and force extraordinary delays in the assessment, treatment, and disposition of all patients arriving at that ED. This will lead to significant public frustration, risk to patient safety, and ultimately will discourage some patients from going to the ED when they need care. ED overload and ambulance off-load delays will be pervasive, occurring consistently during peak hours of the day at Kaiser-Richmond. The initial impact on other EDs in Alameda and Solano Counties is likely to be low and thus only have a nominal impact on these institutions. However, during periods of high saturation at Kaiser-Richmond, these hospitals would receive a greater additional load.

In the event of a downsizing of ED operations at DSP and the resultant limitation on ambulance arrivals at that facility, all area hospitals are likely to be impacted but, again, Kaiser-Richmond will be the most impacted. Even with the potential for the County EMS Agency to reallocate ambulance patient destinations by policy for more equitable distribution, only a portion of these patients will lend themselves to those changes. The Abaris Group calculates an increase of 12 to 13 new ambulance patients per day at Kaiser-Richmond. These patients will have a higher acuity than walk-in ED patients and will require more resources with nearly half of these patients needing inpatient beds including critical care beds. In an ED the size of Kaiser-Richmond, this is a substantial increase of higher-acuity patients that will lead to ED overload and ambulance delays on a frequent daily basis. This will affect general ambulance traffic and Kaiser patients attempting to arrive by ambulance to their hospital of choice. The remaining 10 to 11 daily ambulance cases transported to other regional EDs will not likely have a substantial effect on these EDs, but saturation of ambulances by Kaiser-Richmond would result in a greater impact on these hospitals.

Many of the new ambulance patients will also require inpatient bed capacity. Should DSP not be able to accept ambulance patients or close, The Abaris Group calculates there would be a sufficient number of medical/surgical (med/surg) beds in the region (see discussion on bed calculations

later in this report), but the current shortage of intensive care beds would become significantly worse. Non-ED admission needs are another concern for the community if DSP closes its hospital. Assumptions on med/surg and intensive care beds would dramatically change should private physicians, currently admitting non-ED admissions at DSP, pre-empt the use of these limited available beds at regional hospitals for their private admission practices.

There will also be a substantial impact on pre-hospital care resources in the West County. A significant increase in ambulance coverage will be needed to offset longer transport times due to any change in status at DSP and resultant ambulance saturation at Kaiser-Richmond. A 2004 report conducted by The Abaris Group concluded that 337 additional ambulance hours would be needed per week to maintain the same level of EMS performance in Contra Costa County. That is the equivalent of two 24/7 ambulances costing $2.5 million annually to sustain. In addition, there would likely be increased patient ED "off-load" times for the ambulance provider due to capacity issues at Kaiser-Richmond that would leave ambulances out of service for longer period of times due to delays in finding a patient bed. There will also likely be a significant impact on fire first responders assisting ambulances with some transports and a potential impact on air medical providers should their services be needed more often to back up the ground ambulance service. Additional ambulance resources will be needed to assist with the resultant secondary transfers that will occur with patients arriving at hospitals with insufficient capacity. This will also add considerably to patient and payer costs. Any reduction of hospital services at DSP would also have a tremendous impact on resources available for major emergencies in the community. Should the hospital close and the West County be isolated during such an emergency, this could have an enormous impact on mortality and morbidity.

There is also the consideration that many of these displaced patients would be taken to hospitals without their specialty physician would not have hospital privileges, the patient's medical records would not be available at that hospital and certain payer preferences would likely not be honored further adding costs to the patient experience.

In summary, The Abaris Group's conclusions are as follows:

(1) Closure of the ED at DSP will have a substantial, harmful effect on local health care providers and to the public in general in the West County.

(2) Kaiser-Richmond will be disproportionately affected with a significant increase in ambulance traffic (approximately 12 new ambulance cases per day) and a substantially higher total ED patient volume (100 – 120 additional patients per day).

(3) Kaiser-Richmond's ED and inpatient capacity would be insufficient to handle the new volume of cases from the ED walk-in and subsequent hospital admissions.

(4) It is unlikely that walk-in patients would travel to considerably more distant EDs for their care, thus creating higher volumes at Kaiser-Richmond and long waits.

(5) The long waits for walk-in patients would be frustrating for them, delay their assessments, and ultimately may discourage patients who need an ED from seeking care there.

(6) Waiting times at Kaiser-Richmond will likely reach 10 – 12 hours for walk-in patients.

(7) The significant increase in ambulance volume at Kaiser Richmond will likely lead that hospital to substantial increases in ambulance "off-load" times for ambulance cases arriving at the hospital. The 45-minute "off-load" delays typical for West County are anticipated to reach 80 – 100 minutes if the majority of ambulance traffic is diverted to Kaiser Richmond.

(8) Increasing ambulance saturation at Kaiser-Richmond will mean higher volumes to other EDs in the region who are already at maximum capacity and cannot handle this additional load.

(9) It is unlikely that all ambulances could be safely diverted to other regional EDs without some risk to patient care.

(10) There is insufficient intensive care unit (ICU) bed capacity in the region to handle the potential new volume of admissions from DSP.

(11) The prehospital care system is likely to be substantially impacted in the West County and moderate impact countywide likely affecting ambulance response times to 911 calls and delaying handoff of patients from first responder fire agencies with the potential of impacting their operations.

(12) Should DSP close its ED, there would be a significant drop in emergency resources available in the event of a major emergency. Current DSP employees would have to find work outside the region, further reducing trained healthcare personnel available during an emergency.

(13) Patients, their medical records, specialty physicians for these patients would be displaced and there would likely be payer consequences adding to the costs of these events.

Findings

Other findings of The Abaris Group on the potential closure of DSP's ED are as follows:

(1) DSP is licensed for 189 beds, 25 ED treatment stations and 35 ICU beds.

(2) The hospital had a total of 6,293 hospital admissions in 2009 with 5,204 of these admissions coming from the ED (83 percent).

(3) DSP is the busiest ED in West County with a 2009 ED volume of 40,473 visits and has the second highest ambulance volume countywide with 8,186 ambulance arrivals.

(4) It is the only hospital in the West County with a STEMI (ST-Elevated Myocardial Infarction) Center; the next closest is 15 minutes away assuming patients are not transported to a closer, non-STEMI hospital for diagnosis before being transferred to a STEMI center. DSP provides 25 percent of the STEMI care in the county. Patient outcomes would be threatened and longer lengths of stay expected due to the resulting delays in arranging for interfacility transfer or transporting patients to more distant STEMI centers. This critical asset would be a substantial loss to the healthcare system.

(5) The hospital and ED resources in the West County are already strained with the past closure of Doctors Medical Center Pinole. This is evidenced by the need for the past expansion of the ED at DSP and in/outpatient services at Kaiser-Richmond.

(6) The next closest hospital to DSP is Kaiser-Richmond with 42 acute care beds, 8 ICU beds and 15 ED treatment stations.

(7) Other hospitals in adjacent communities with travel times from DSP include: Kaiser Richmond (8 minutes), Alta Bates Summit (15), Alta Bates Berkeley (16), Children's Oakland (16), Kaiser Oakland (16), Alameda County - Highland (19), Sutter Solano (25), Kaiser Vallejo (23), Contra Costa Regional (23), Marin General (27), John Muir Concord (27) and Kaiser Walnut Creek (31).[1]

(8) Any change in ED services and resultant inpatient services will have a dramatic impact on access of care for the community members and on other West County and regional providers.

(9) Alternative delivery systems (e.g. urgent care, public health clinics) and transportation resources are not currently available to assist with redirecting walk-in patients to other EDs beyond the facilities at Kaiser-Richmond.

(10) In particular, Kaiser-Richmond would be the most impacted with an expected full year impact of 38,815 new ED patients (83 per day) including 4,633 new ambulance patients (12.3 per day). In 2009, the Kaiser-Richmond ED saw 28,538 patients with 4,412 arriving by ambulance. The new (2012) annual volume would be 67,353 for an increase of 136 percent from the 2009 ED volume; ambulance patients would increase by 105 percent.

(11) Other hospitals would be impacted with new volumes to different extents (using data from the 2006 ED closure as a model). The full year impact of a closure is expected to increase calendar year 2012 total ED volume by 1,780 patients at Alta Bates Berkeley, a 4.1 percent increase, and 391 at Alta Bates Summit, a 0.9 percent increase. These volume increases are not significant and would not overwhelm these facilities. However, Contra Costa Regional Medical Center is the busiest, most saturated ED in the County and would be disproportionately affected. The DSP closure would send an additional 3,129 patients to Contra Costa Regional Medical Center, which is more than the already overburdened ED can absorb. It already sees more than double the number of patients per treatment station (3,543 per OSHPD in 2009) than almost every other ED in the county.

(12) The heavy increases of ambulance traffic at Kaiser-Richmond could require that it frequently activate its emergency/disaster medical surge protocols forcing diversion of all ambulance traffic having an even larger impact on patients and hospitals in the region and thus further straining resources with long cross-county transport times. Diversion is not permitted in Contra Costa County except for internal disaster.

(13) The med/surg bed need generated by a closure might be absorbed by Kaiser-Richmond and the two Alta Bates hospitals. However, during peak periods admissions may be much higher than average and exceed capacity requiring frequent emergency surge protocol activation.

(14) A DSP closure would result in a shortage of critical care beds (per 2009 OSHPD data). There are currently not enough ICU beds in Contra Costa County as current occupancy is 66.5 percent (65 percent is considered the maximum). Without the DSP critical care capacity, ICU census for the county would reach 84.7 percent.

[1] Assumes no delays due to commute traffic, construction, vehicle crashes, etc. This could add another 20 to 30 minutes.

(15) There would likely be a significant resource impact on the ambulance delivery system with more ambulance hours needed due to the longer transport times and to assure compliance with performance standards. A prior report identified that more than 300 additional ambulance unit hours per week would be needed to maintain the existing level of ambulance service. Since it is unlikely that funding would be available to cover the over $2 million annual cost of those additional unit-hours, changes in service level requirements would need to be considered. There would also be an unspecified but significant operational impact on the fire first responder providers who would have longer call times due to longer transports and air medical providers who may be requested to conduct additional transports in the region.

(16) There would be significantly less reserve resources to respond to a major incident or disaster. Approximately 11 – 16 percent of the county's total medical surge capacity disaster bed capacity would be eliminated; the West County medical surge capability would drop by at least 81 percent (assuming that Kaiser Richmond could only surge 5 percent, which most hospitals could do up to 15 – 25 percent).

(17) The closure of DSP would cause a net increase in the cost of healthcare for West County residents. Access to primary and ED care will be more difficult, resulting in significant impacts for CCRMC and Kaiser Richmond. As access to care becomes more restricted, West County residents are likely to delay care for treatable conditions until they become emergent. Residents will have to travel further (if they have transportation) for even the most minor of conditions to use their insurance providers. West County ambulance transport times would be longer and cost more, residents transported to non-plan hospitals would incur treatment charges until they could be safely transferred to complete their care requiring more doctors, nurses, and staff to cover the longer length of stays, frequent re-admissions and increased volume caused by the disruption in West County healthcare.

Overview

An audit released on June 14, 2011 identified significant financial concerns for the long-term sustainability of DSP. The audit identified millions of dollars of operating losses over the past three years. This follows the medical center's bankruptcy, which was declared in 2006. During the bankruptcy period, the Emergency Department (ED) was closed to ambulance traffic for almost two months. Prior to July 2004, Tenet Healthcare Corporation operated the hospital on behalf of the West Contra Costa Healthcare District.

While the District is seeking to continue hospital services, the Contra Costa County EMS Agency believes it prudent to undertake an analysis of the potential impact of a change of services or closure of the hospital on the provision of emergency care in the West County area. Thus, The Abaris Group has been asked to undertake an independent analysis of the impact of a potential closure of DSP.

Issues raised by the EMS Agency to be addressed in this study include the overall impact on the emergency care system of the loss of the ED and critical care beds currently provided by DSP, impact on the residents of west Contra Costa County of reduced resources and longer transport times, impact on the EMS system (i.e., ambulance and first responders) of reduced local hospital emergency care resources, the potential impact on other hospitals and health care systems in Contra Costa and neighboring counties, and the potential impact of a major emergency or disaster on the remaining healthcare providers in the West County area. The Abaris Group has been asked to undertake an independent analysis of the impact of a potential closure of DSP.

Scope

For this study, The Abaris Group conducted an assessment of ED and critical care bed demand and population changes in the West County to assist with the evaluation of the potential impact of a change in providers. The Abaris Group has also prepared various scenarios on the impact, cross connecting predicted demand and changes in demand on the various stakeholder groups including patients, EMS providers, hospitals and other healthcare providers.

Specific steps taken in this study included:

(1) Collected data on historical, current and future West County population, ED utilization, critical care and EMS transports
(2) Collected and evaluated historical documents and reports (i.e., Impact Evaluation Report on the Doctors Medical Center Pinole Proposed Closure of Emergency Services, January 14, 2000 and The Abaris Group West County ED Access Study from May 2004)
(3) Prepared impact analysis including scenarios and their impact:
    a. Impact on emergency and non-emergency medical care for residents of West County communities
    b. Impact on EMS system
    c. Impact on other hospitals and health care systems (e.g., Contra Costa Regional Medical Center, Kaiser, Alta Bates)
    d. Impact on other health care providers (e.g., county and community clinics, private physician practices)

The Environment

DSP is an acute care hospital licensed for 189 beds, 25 ED treatment stations and 35 ICU beds. The 2009 ED volume of 40,473 makes the ED the busiest in the West County area and it is the second highest volume ambulance destination site countywide with 8,186 EMS arrivals during 2009. The hospital is the destination for approximately 71 percent of all ambulance transports for the West County area. According to data from the Office of Statewide Health Planning and Development (OSHPD), the hospital admitted from the ED 5,204 patients (12.9 percent of ED visits) during 2009.

The only other hospital in the immediate area serving the West County is Kaiser-Richmond. In comparison, Kaiser-Richmond has 50 licensed beds, 15 ED treatment stations (14 beds and 1 ear, nose and throat chair), and 8 ICU beds. The number of ED arrivals at Kaiser-Richmond for 2009 was approximately 28,538. While Kaiser-Richmond is a full-service hospital, it does not offer some tertiary services such as cardiac surgery, orthopedics, or pediatrics. These services are offered at the Kaiser Oakland campus. Kaiser-Richmond's ED admissions were approximately 1,930 (6.7 percent) of their ED patients in 2009.

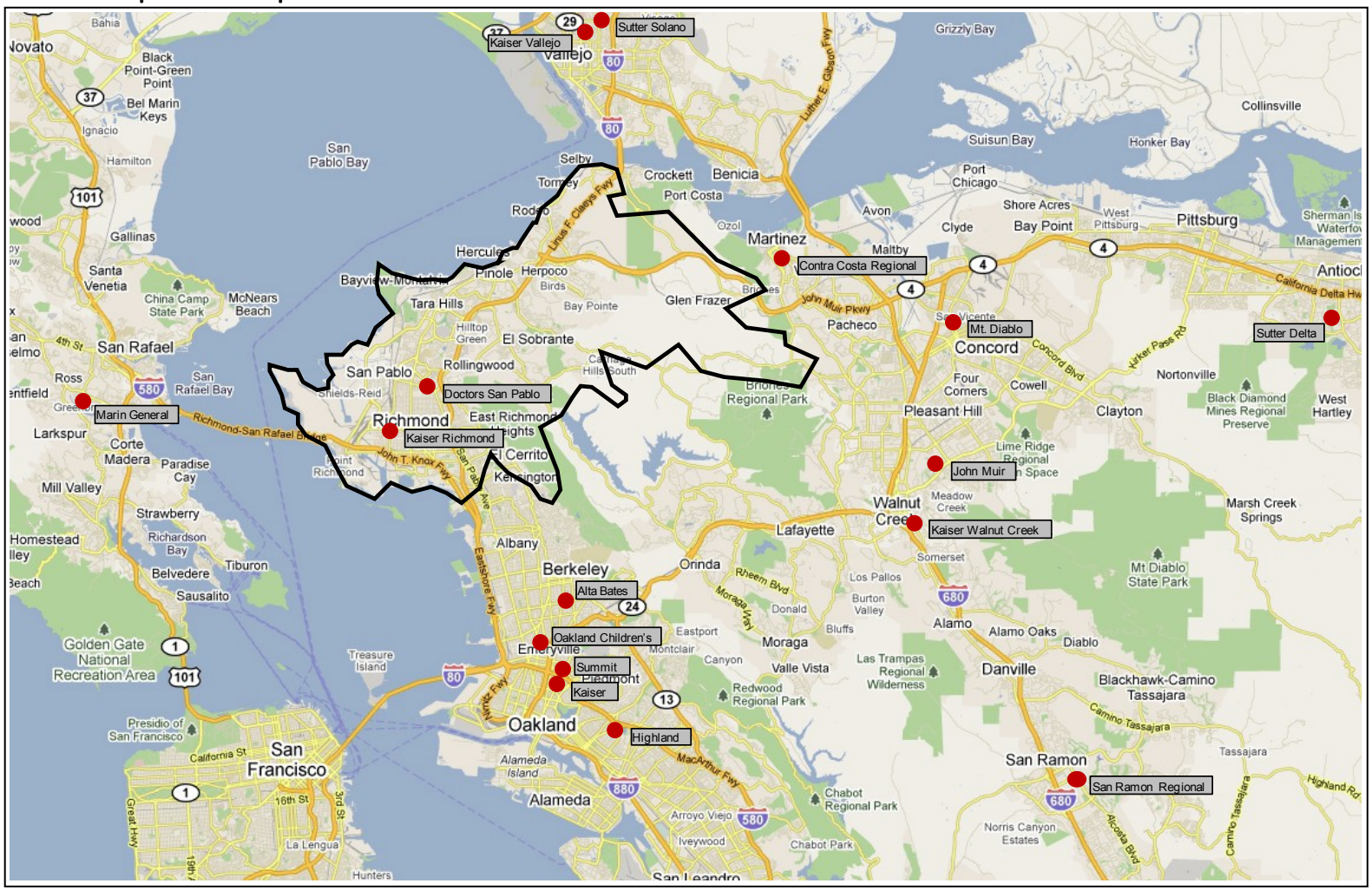
The following is a list of other hospitals in the adjacent area of DSP with EDs and the number of licensed ED treatment stations:

- Alameda County Med Center - Highland Campus – 52 treatment stations
- Alta Bates Summit Medical Center - Alta Bates (Berkeley) Campus – 22 treatment stations
- Alta Bates Summit Medical Center - Summit Campus – 30 treatment stations
- Children's Hospital and Research Center at Oakland – 37 treatment stations
- Contra Costa Regional Medical Center – 20 treatment stations
- Kaiser Foundation Hospital, Vallejo – 26 treatment stations

- Marin General Hospital – 18 treatment stations
- Sutter Solano Medical Center – 21 treatment stations

The following map provides a geographical portrayal of regional hospitals and the approximate area of the West Contra Costa Healthcare District.

Exhibit 1: Map of Area Hospitals and the West Contra Costa Healthcare District



Pinole Campus Impact Evaluation Report

In November 1999, Doctors Medical Center notified the Contra Costa EMS Agency of a planned realignment of services between the Pinole and San Pablo campuses effective March 2000. The proposed realignment included the closure of the acute medical care and intensive care units at the Pinole campus and replacement of the Pinole ED with an urgent care center. The Pinole campus was to retain outpatient surgery services, transitional care, long-term care, substance abuse, sleep lab, and cardiac rehabilitation.

An Impact Evaluation Report was prepared by the Contra Costa EMS Agency to assess the impact of the ED closure on the community, including the impact on access to emergency care and the impact on emergency services provided by other entities such as ambulance, police, fire, and other area hospitals. The impact report was submitted to the State Department of Health Services in accordance with provisions of Health and Safety Code Section 1300. The State Department of Health Services allowed the downgrading of emergency services at the Pinole campus to urgent care status.

The existence of the Impact Evaluation Report for the Pinole campus provides an opportunity to compare the predictions of the earlier report with actual experience. Several scenarios were provided in the original analysis. For example, the report indicates that anywhere from 0 to 10,091 visits were projected for the Pinole Urgent Care Center during 2000. In actuality, the current Pinole Urgent Care Center is treating approximately 5,200 patients annually. The report also predicted an ED visit impact on DSP of anywhere from 3,604 to 13,837 new ED visits in 2000 (a range of 11 to 42 percent), based on reallocation of the Doctors Pinole ED volume for the full year. The actual 2000 increase in ED visits at DSP was 6,739 (26 percent), but given that the Pinole campus did not close their ED until April 3, 2000, the annualized increase at DSP was 8,985 (34 percent) (assuming all of the growth was due to the Pinole closure). In 2001, DSP experienced an additional increase of 3,745 ED patients (11 percent). The hospital had been experiencing a decline of ED visits averaging 1.4 percent for the previous five years (1994-1999).

At the time of the County impact analysis, Kaiser-Richmond had a Standby ED permit but was authorized to accept most ambulance patients due to having recently added ICU beds. ED visits to Kaiser-Richmond decreased by 1,701 (5.4 percent) for 2000 and the hospital experienced a small increase in 2001 of 344 ED patients (1.1 percent). The decline may have been a function of changes in reporting ED visits as Kaiser, which has a triage system that sends lower acuity patients to their urgent care area.

Thus the Urgent Care Center in Pinole did not achieve as high a volume of patients as expected, but DSP did experience the predicted large growth in ED volume in the year of closure and the next year primarily due to the closure of Doctors Pinole. Kaiser-Richmond does not appear to have been impacted.

Demand and Resources

Population

The 2010 population of the West County area most served by DSP is approximately 205,675 and expected to grow to 220,613 by the year 2015. This is an annual average growth rate of 1.4 percent.

Exhibit 2: Population Projections for Cities in West County, 2005-2015

Population Projections, 2005-2015					
City	2005	2010	Average Growth per Year, 2005-2010	2015	Average Growth per Year, 2010-2015
Richmond	102,307	105,630	0.6%	113,302	1.4%
San Pablo	31,129	32,131	0.6%	34,465	1.4%
Hercules	23,198	24,693	1.3%	26,486	1.4%
El Cerrito	23,244	23,666	0.4%	25,385	1.4%
Pinole	19,469	19,555	0.1%	20,975	1.4%
Total	**199,347**	**205,675**	**0.6%**	**220,613**	**1.4%**

Source: California Department of Finance, 2005-2010, Abaris Group projections

Note: Population projection based on California Department of Finance projected growth for Contra Costa County

ED Capacity

The region has two EDs that primarily serve the West County area with an additional seven hospitals within the county that partially serve the ED visit needs of the West County and an additional eight hospitals that serve the fringe population needs of the West County.

Exhibit 3: Comparison of Emergency Departments

Comparison of Emergency Departments in Vicinity of Doctors Medical Center San Pablo							
Hospital	Hospital Licensed Beds	Intensive Care Beds[1]	Med/Surg Beds[2]	ED Visits	ED Treatment Stations	ED Visits/ Station	West County EMS Transports[3]
West County							
Doctors Medical Center, San Pablo	189	35	154	40,473	25	1,619	7,301
Kaiser Foundation Hospital, Richmond	50	8	42	28,538	15	1,903	4,402
West County Total	**239**	**43**	**196**	**69,011**	**40**	**1,725**	**11,703**
Doctors Medical Center, San Pablo Share of Total	79.1%	81.4%	78.6%	58.6%	62.5%	-	62.4%
Other Contra Costa County							
Contra Costa Regional Medical Center	166	8	91	70,850	20	3,543	2,139
John Muir Medical Center, Walnut Creek[4]	330	24	201	45,463	32	1,421	263
John Muir Medical Center, Concord Campus[5]	254	15	229	43,737	26	1,682	N/A
Kaiser Foundation Hospital, Walnut Creek	233	24	138	44,104	44	1,002	60
Kaiser Foundation Hospital, Antioch	150	20	96	28,537	24	1,189	N/A
San Ramon Regional Medical Center	123	6	99	17,132	9	1,904	N/A
Sutter Delta Medical Center	145	12	107	52,658	32	1,646	N/A
County Total	**1,640**	**152**	**1,157**	**371,492**	**227**	**1,637**	**14,165**
Outside Contra Costa County							
Alameda County Med Center - Highland Campus	316	20	191	83,611	52	1,608	43
Alta Bates Summit Medical Center - Alta Bates Campus	347	16	146	42,492	22	1,931	1,031
Alta Bates Summit Medical Center - Summit Campus-Hawthorne	337	24	301	39,468	30	1,316	87
Children's Hospital and Research Center at Oakland	190	23	111	55,498	37	1,500	219
Kaiser Foundation Hospital, Oakland	341	30	221	45,273	30	1,509	117
Kaiser Foundation Hospital-Rehabilitation Center, Vallejo	287	9	160	44,164	26	1,699	262
Marin General Hospital	235	10	164	34,713	18	1,929	N/A
Sutter Solano Medical Center	111	12	60	34,416	21	1,639	42

1 Intensive Care Beds include all types except neonatal

2 Children's Hospital pediatric beds are reported here under the Med/Surg category

3 EMS transport data from Contra Costa EMS for 2010

4 John Muir Walnut Creek recently increased to 44 ED treatment stations and recently expanded to 572 licensed beds

5 John Muir Concord recently increased to 33 ED treatment stations

Sources: OSHPD Annual Utilization Reports 2009; Contra Costa EMS

The total 2009 ED visits for the two hospitals located in the West County was 67,756. When compared to the West County population of 205,675, this calculates to an ED utilization rate of 329.4 ED visits per 1,000 population. Available California and Contra Costa County utilization data show an average ED utilization rate of 288 and 324 per 1,000, respectively. The calculated West County ED utilization rate may understate the utilization rate in the West County due to some residents seeking care in non-West County EDs. Likewise the rate may also be overstated if there is a large influx of employees who may use a West County ED during the daytime but would not be reflected in the area's population. Nonetheless, this ED utilization rate appears to be higher than the state and the county.

DSP and Kaiser Medical Center Richmond have treatment space to patient utilization ratios of 1,619 and 1,903, respectively. Between both of them, there are a total of 40 licensed ED treatment stations in the West County and an average of 1,725 ED visits for each treatment station. A generally recognized national utilization rate is 1,600 patients per bed. Thus, the West County does not appear to have enough capacity when considering the number of ED treatment stations per volume of cases without considering the potential closure of DSP. Seasonal volume changes would cause reoccurring peaks in demand and additional challenges getting seen in the West County EDs.

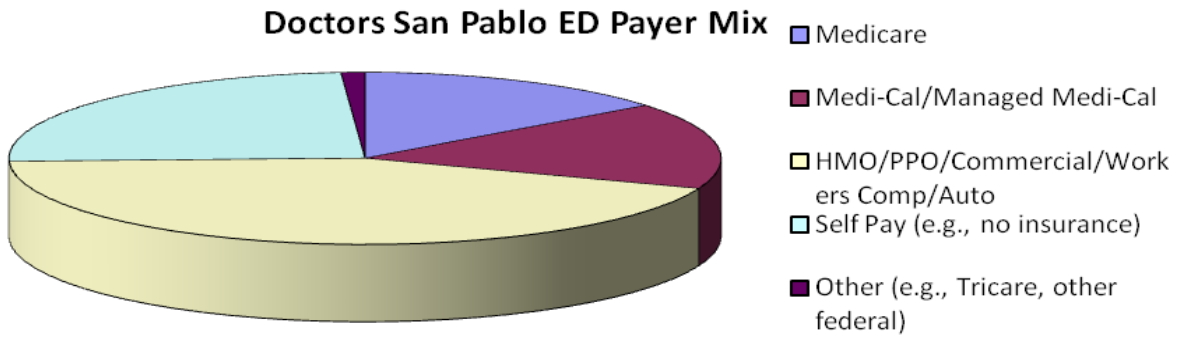
ED Payer Mix

Using data provided through OSHPD, the ED payer mix for DSP is 14.4 percent Medicare, 16.2 percent Medi-Cal, 43.6 percent HMO/PPO/Commercial/Workers Comp, and 24.4 percent Self Pay (e.g., no insurance). The Self Pay mix is nearly double the rate in many EDs throughout the state.

Exhibit 4: Doctors San Pablo ED Payer Mix, 2011

Doctors Medical Center, San Pablo Emergency Department Visits by Expected Payer Source, First Quarter 2011		
Payer	**Visits**	**Percent of Total**
Medicare	1,216	14.4%
Medi-Cal/Managed Medi-Cal	1,370	16.2%
HMO/PPO/Commercial/Workers Comp/Auto	3,677	43.6%
Self Pay (e.g., no insurance)	2,062	24.4%
Other (e.g., Tricare, other federal)	91	1.1%
Blank / Not Reported	20	0.2%
Total	**8,436**	**100.0%**

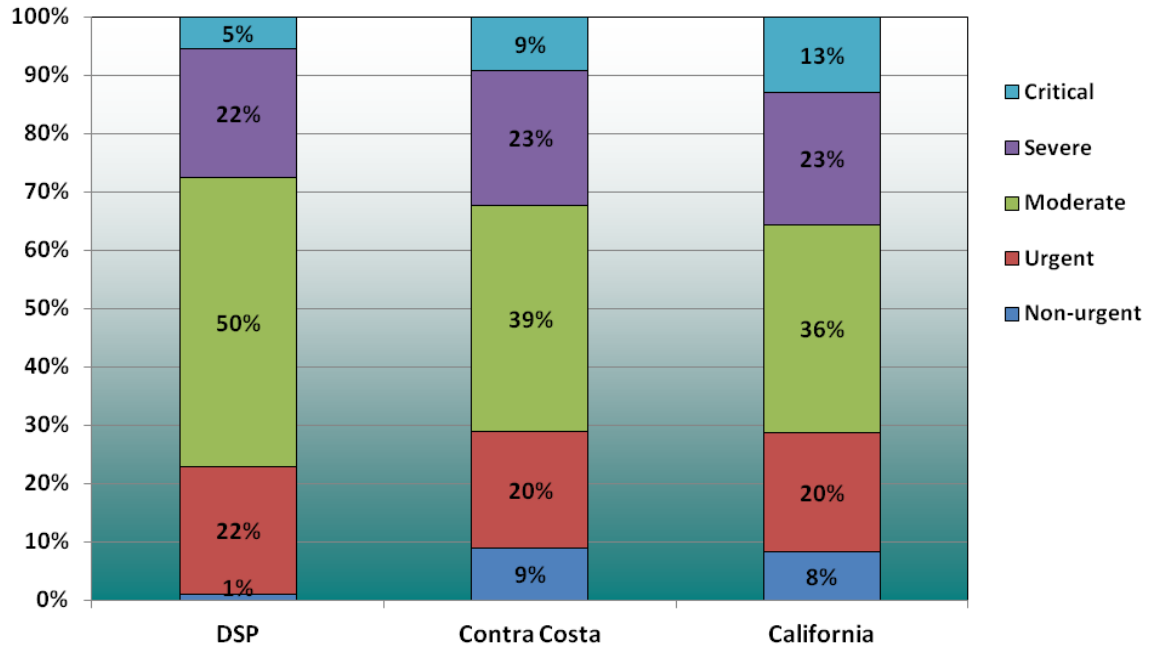
Source: OSHPD MIRCal Emergency Department Profile Reports



ED Acuity

The acuity (or level of severity) of DSP ED patients can be estimated by considering their rate of admission to the hospital following treatment in the ED. DSP has an ED patient admission rate of 12.9 percent, which is just slightly higher than the nation (12.0 percent) and the state (12.5 percent.). Another marker is the ED patient acuity mix reported to the state. The following table demonstrates that DSP reports a similar acuity mix to the county and state. In 2009, the greatest numbers of patients were classified as moderate (50 percent), 22 percent were severe, and 5 percent were defined as critical. Comparable state and countywide data for 2009 are included in the table below. DSP treats more moderate and fewer critical and non-urgent patients than their county and state counterparts.

Exhibit 5: Doctors San Pablo ED Acuity Mix, 2009



Source: OSHPD Annual Utilization Report, 2009

The median income levels of the cities in the West County are listed on the following table.

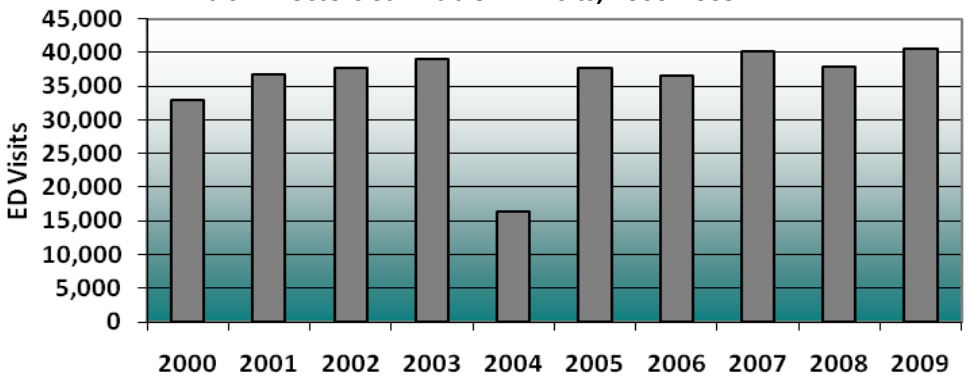
Exhibit 6: Median Household Incomes by City, 2009

Median Household Incomes by City, 2009	
City	**Median Income**
El Cerrito	$ 76,656
Hercules	$ 88,179
Pinole	$ 78,835
Richmond	$ 55,146
San Pablo	$ 46,007
California	$ 60,392

Source: US Census Bureau, American Community Survey 2005-2009 5-year estimates

The following table provides historical ED volume growth for DSP from 2000 to 2009. While there has been rapid growth since the year 2000, most of this was due to the closure of Doctors Pinole. The growth rate for the past three years (2007-2009) has been 3.6 percent. OSHPD data for 2004 indicated roughly half of the expected volume based on other years. This may be a result of reporting inconsistencies related to the transition from Tenet back to the District's management in July 2004.

Exhibit 7: Doctors San Pablo ED Visits, 2000-2009



Source: OSHPD Annual Hospital Utilization Reports, 2000-2009

Impact

The following chart provides an estimate of driving time from DSP to hospitals in the same region. From a consumer standpoint, 15 minutes is traditionally used as a marker for discretionary time to an ED. That is, a consumer will often be willing to drive 15 minutes farther (assuming they have their own transportation) to obtain what might be perceived as more accessible ED care. While there is no published time for ambulance bypass, up to 25 minutes was chosen by The Abaris Group for this analysis.

The 15-minute private person (walk-in patient) parameter would therefore only include Kaiser-Richmond and Alta Bates Summit. Children's Hospital might draw more public utilization due to their specialty care. Alta Bates-Berkeley is just outside the calculated 15-minute driving time by 1 minute as is Kaiser Oakland. For the 25-minute ambulance threshold, Kaiser Oakland, Highland, Kaiser Vallejo, Contra Costa Regional, and Sutter Solano would all be added as potential substitute ambulance destinations. Marin General and John Muir-Concord hospitals fall just outside the 25-minute parameter by 2 minutes. These driving times will vary by time of day, unusual traffic congestion, construction, and type of transport (e.g., private car, public transportation); this may further impact what is an acceptable distance to reach another ED.

Exhibit 8: Estimated Travel Times from Doctors San Pablo to Nearby Hospitals

Travel Times from Doctors San Pablo to Nearby Hospitals				
Hospital	City	Distance	Approx. Travel Time from Doctors-SP (minutes)	Assumed Average MPH
Kaiser Foundation Hospital, Richmond	Richmond	2.4	8	18
Alta Bates Summit Medical Center - Summit Campus	Oakland	11.8	15	47
Alta Bates Summit Medical Center - Alta Bates Campus	Berkeley	10.9	16	41
Kaiser Foundation Hospital, Oakland	Oakland	12.2	16	46
Children's Hospital and Research Center at Oakland	Oakland	12.4	16	47
Alameda County Medical Center - Highland Hospital	Oakland	14.4	19	45
Kaiser Foundation Hospital-Rehabilitation Center, Vallejo	Vallejo	16.0	23	42
Contra Costa Regional Medical Center	Martinez	16.2	23	42
Sutter Solano Medical Center	Vallejo	16.4	25	39
Marin General Hospital	Greenbrae	17.3	27	38
John Muir Medical Center, Concord	Concord	22.0	27	49
Kaiser Foundation Hospital, Walnut Creek	Walnut Creek	25.8	31	50
John Muir Medical Center, Walnut Creek	Walnut Creek	26.4	34	47
Sutter Delta Medical Center	Antioch	34.7	39	53
San Ramon Regional Medical Center	San Ramon	36.4	43	51
Kaiser Foundation Hospital, Antioch	Antioch	38.0	46	50

Source: Google Maps, 2011

The following tables list ambulance traffic to DSP by city of origin. The largest source of ambulance patients is Richmond (3,530) followed by San Pablo (1,817), Pinole (606), and El Cerrito (451). The remaining communities with ambulance originations are also listed.

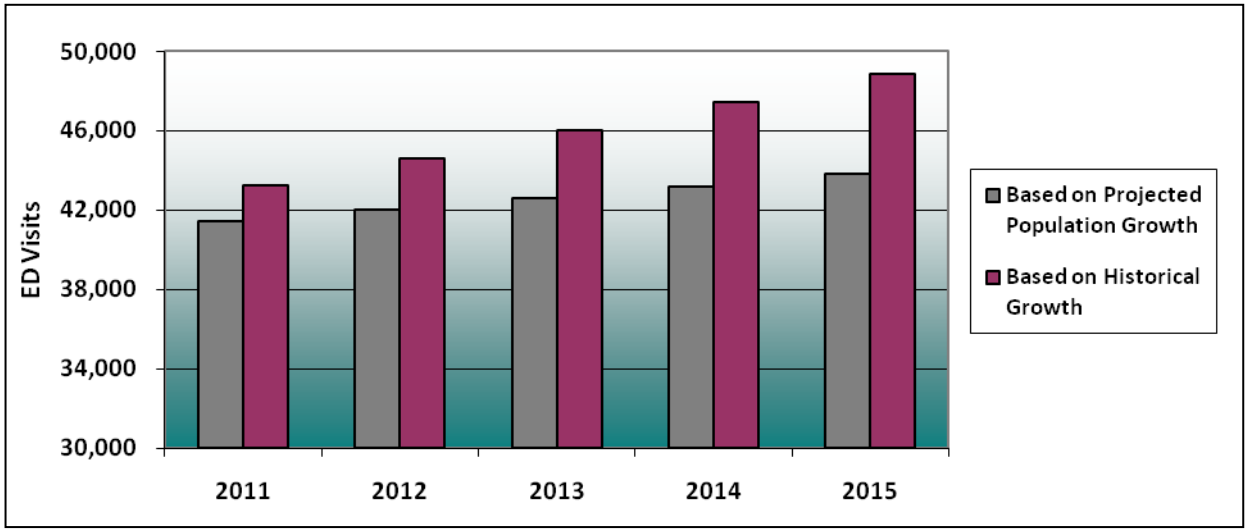
Exhibit 9: Ambulance Volume to Doctors San Pablo, 2010

AMR Volume to Doctors San Pablo by City, 2010		
City of Origin	**Count**	**Percent of Total**
Richmond	3,530	48.3%
San Pablo	1,817	24.8%
Pinole	606	8.3%
El Cerrito	451	6.2%
El Sobrante	343	4.7%
Hercules	264	3.6%
Rodeo	244	3.3%
Crockett	37	0.5%
Kensington	9	0.1%
Other	15	0.2%
Total	**7,316**	**100.0%**

Source: Contra Costa EMS Agency

The following table projects DSP ED potential volume growth until the year 2015. The ED volume projection assumes either that ED visit growth occurs at the same pace as population (1.4 percent annually) or based on the past four years ED volume growth rate of 3.4 percent.

Exhibit 10: Doctors San Pablo ED Volume Projections, 2011-2015



The table on the following page lists the current ED volume at DSP and provides projections on the ED volume at nearby EDs should the ED at DSP close. The Abaris Group calculated current and projected future ED volume at DSP and then reallocated that volume for the partial year for 2011 (assuming an August 1 closure date) and for the full year for remaining years. Allocations were made based on the next closest ED using the home zip code from data available of ED visits at DSP. This data includes ED walk-ins and ambulance traffic.

It was assumed that reasonable adjustments would be made by some of the public in communities where the new commute distance to a farther away but less impacted hospital would be short and therefore be deemed more accessible to the public in that community. This included patients from El Cerrito using Alta Bates Berkeley and patients from Hercules/Rodeo using Solano County hospitals. No interventions were assumed (e.g., new EDs, new urgent care centers, increased ED capacity at adjacent EDs, extensive public education or marketing campaigns). Absent aggressive and substantial interventions, it is not likely a substantial number of the public would use anything other than the next closest ED.

As the table demonstrates, the impact on Kaiser-Richmond would be dramatic. Kaiser-Richmond would experience an immediate 58 percent increase in their ED visits during the remainder of 2011 and another 50 percent the following year (a 136 percent increase in just 16 months). Using the 1 bed per 1,600 visits guideline, Kaiser-Richmond would treat more than double that volume per treatment station – 3,924. Under these circumstances, ambulance off-load times would become substantial and waiting times for walk-in patients would likely reach 10 – 12 hours. The loss of ambulance unit hours to the 911 system would negatively impact response times significantly or require additional unit hours costing easily over a million dollars annually. The impact on other nearby EDs was projected to be nominal and thus bed utilization was not calculated.

Exhibit 11: DSP Closure Impact on ED Volume at Other Hospitals, 2011-2015

Impact on ED Volume 2011 - 2015												
Hospital	**2010**	**Pts/bed**	**2011[1]**	**Pts/bed[2]**	**2012**	**Pts/bed**	**2013**	**Pts/bed**	**2014**	**Pts/bed**	**2015**	**Pts/bed**
West County - Total Volume												
Doctors Medical Center, San Pablo	40,473	1,619	25,242	1,731	***Hospital is closed effective August 1, 2011***							
Kaiser Foundation Hospital, Richmond	28,538	1,903	44,981	2,999	67,353	4,490	69,535	4,636	70,680	4,712	71,860	4,791
Other Contra Costa County - New Volume Only												
Contra Costa Regional Medical Center	-		1,201		2,972		3,073		3,178		3,286	
John Muir Medical Center, Walnut Creek	-		23		57		59		61		63	
Kaiser Foundation Hospital, Walnut Creek	-		-		-		-		-		-	
John Muir Medical Center, Concord	-		170		421		436		451		466	
San Ramon Regional Medical Center	-		-		-		-		-		-	
Sutter Delta Medical Center	-		-		-		-		-		-	
Kaiser Foundation Hospital, Antioch	-		-		-		-		-		-	
Outside Contra Costa County - New Volume Only												
Alameda County Med Center - Highland	-		-		-		-		-		-	
Alta Bates Summit Medical Center - Alta Bates	-		705		1,743		1,803		1,864		1,927	
Alta Bates Summit Medical Center - Summit	-		173		427		442		457		472	
Children's Hospital at Oakland[3]	-		964		2,385		2,466		2,550		2,637	
Kaiser Foundation Hospital, Oakland	-		114		283		292		302		313	
Kaiser Foundation Hospital, Vallejo	-		64		157		163		168		174	
Marin General Hospital	-		15		37		38		39		41	
Sutter Solano Medical Center	-		33		82		85		88		91	

1. Assumes Doctors San Pablo closes ED on 8-01-11

2. Doctors San Pablo bed utilization for Jan - July 2011, Kaiser for August - December 2011

3. Assumes 5 percent of ED volume will go to Childrens-Oakland

Note: All ED volumes assume 3.4 percent growth rate. New volume from transports calculated based on patterns seen during the 2006 DSP closure. New volume from walk-ins based on ED patient zip code patterns from 2003.

Sources: Contra Costa County EMS Agency and The Abaris Group projections

Ambulance Transports

A substantial impact on ambulance transports is anticipated should the ED at DSP close. During 2010, 7,316 ambulance patients were transported to the DSP ED. For purposes of this scenario, The Abaris Group assumed that ambulances originating in Richmond, San Pablo, and Pinole would be transported to the closest ED, which would be Kaiser-Richmond. Ambulances originating in El Cerrito would be transported to one of the two Alta Bates hospitals. Ambulances originating in Hercules, Crockett, and surrounding region would be transported to Contra Costa Regional Medical Center. A modest percentage of transports (5 percent) were assumed to be pediatric and thus transportable to Children's Oakland from any destination in the region.

This scenario does not contemplate the use of the EDs at hospitals farther away. Traffic patterns and the capacity at the other hospitals might dictate some transports to these facilities but the volume of calls would not have a material impact on the hospital. While it is possible, it is not likely that ambulances originating in this region would routinely be sent to Alameda County Highland Hospital, Kaiser Medical Center Vallejo, Sutter Solano Medical Center, or Marin General Hospital due to perceived geographical or trade barriers.

The following tables demonstrate under this scenario that Kaiser Richmond would see an immediate and dramatic impact on their ambulance arrival volume, initially with an average of 11.9 ambulances per day and eventually growing to 13.6 per day by the year 2015. Other hospitals would see a smaller impact. However, ambulance and walk-in patient saturation at Kaiser Richmond would increase the impact on the other EDs in the region.

Exhibit 12: Daily Range of Ambulance Arrivals Impact if Doctors San Pablo ED Closes, 2011-2015

Daily Ambulance Impact Range- ED Closure at Doctors San Pablo						
	Baseline Range	Daily Range New Ambulance Arrivals				
Year	Doctors San Pablo	Kaiser Richmond	Alta Bates Berkeley	Contra Costa Regional Medical Center	Alta Bates Summit	Other
2010	18.5-24.5	-	-	-	-	-
2011	16.8-22.8	9.9-13.9	3.7-5.7	2.6-4.6	0.0-1.8	0.0-1.9
2012	-	10.3-14.3	3.8-5.8	2.7-4.7	0.0-1.8	0.0-1.9
2013	-	10.7-14.7	4.0-6.0	2.8-4.8	0.0-1.8	0.0-1.9
2014	-	11.1-15.1	4.1-6.1	2.9-4.9	0.0-1.8	0.0-2.0
2015	-	11.6-15.6	4.3-6.3	3.1-5.1	0.0-1.9	0.0-2.0

Source: Contra Costa EMS Agency, 2011

Notes: Daily average ranges for new ambulance arrivals are based on ambulance arrivals patterns seen during DSP closure in 2006 and a 3.4% annual growth rate in ED visits

Exhibit 13: Annual Ambulance Impact if Doctors San Pablo ED Closes, 2011-2015

Annual Ambulance Impact - ED Closure at Doctors San Pablo						
	Baseline	Annual Ambulance New Volume to Nearby Hospitals				
Year	Doctors San Pablo	Kaiser Richmond	Alta Bates Berkeley	Contra Costa Regional Medical Center	Alta Bates Summit	Other
2010	7,316	-	-	-	-	-
2011[1]	5,043	1,781	698	534	114	131
2012	-	4,481	1,756	1,344	287	329
2013	-	4,633	1,816	1,389	297	340
2014	-	4,791	1,877	1,437	307	352
2015	-	4,954	1,941	1,486	318	364

1. Partial year for DSP (January - July 2011)

Notes: New volume is based on ambulance arrivals patterns seen during DSP closure in 2006 and a 3.4% annual growth rate in ED visits

Hospital Beds

DSP data on ED arrivals and admissions as well as admission location were obtained through 2009 OSHPD records. The Abaris Group used the number of DSP admissions from the ED to calculate the average number of med/surg and ICU beds needed to manage the current number of ED admissions should DSP close. The bed impact per day was calculated by taking the hospital ED admissions by unit (i.e., med/surg, telemetry, and ICU), multiplying these admissions by the estimated length of stay to obtain total patient days, and then dividing these patient days by 365 days.

The bed utilization by unit is a daily average. However, admissions do not occur in an "average" manner. They vary based on peak admission periods (e.g., November – February) that can drive substantially higher inpatient bed demand during these periods than the averages demonstrate.

Exhibit 14: Doctors San Pablo ED Patient Disposition Array

Doctors Medical Center San Pablo - ED Patient Disposition		
ED Visits by Disposition	**Number**	**Percentage**
Admissions	5,204	12.9%
Discharges	35,269	87.1%
Total	40,473	100.0%
Med/Surg	2,298	44.1%
Telemetry	1,407	27.0%
ICU	1,178	22.6%
Other	322	6.2%
Total	5,204	100.0%
Bed Utilization	**Length of Stay**	**Bed Impact/Day**
Med/Surg	4.2	26.4
Telemetry	2.0	7.7
ICU	2.8	9.1

Source: OSHPD Annual Utilization Report, 2009
Med/Surg & ICU LOS estimated from hospital OSHPD data
Telemetry LOS estimated from The Abaris Group databank

To determine available beds, The Abaris Group used current licensed beds and current admission volumes for nearby hospitals that would likely be impacted by an ED closure at DSP. The table on the following page provides this data using OSHPD reports for calendar year 2009.

The Abaris Group used national benchmarks to obtain a determination of "full." The Healthcare Advisory Board suggests that a hospital's acute care (or medical/surgical) bed capacity is at full capacity when total utilization reaches 85 percent. The Abaris Group defined critical care (or ICU) bed capacity full at 65 percent.

This following table demonstrates that five of the six hospitals (83 percent) are above capacity for ICU beds. The Abaris Group describes this capacity as theoretical as the actual available capacity in these neighboring hospitals may be overstated as often a hospital has less capacity than their license capacity due to beds being placed out of service or beds that are not staffed. The region serving the West County already exceeds the 65 percent threshold for ICU occupancy without any loss of ICU beds from DSP. Without the latter, the West County ICU bed occupancy would reach 84.7 percent. Again, licensed status of ICU beds is not always a reflection of available beds; the actual capacity could be less. A further concern may be that the current non-ED critical care admissions at DSP might pre-empt the use of these ICU beds at these other hospitals due to medical staff admission practices.

The two hospitals with the lowest theoretical med/surg occupancy rate and thus a theoretical option for absorbing DSP inpatient admissions are Alta Bates Oakland and Kaiser-Richmond, which are at a current med/surg occupancy of 55.2 and 60.8 percent, respectively. However, Kaiser-Richmond has a very small capacity overall (licensed at 42 med/surg beds) and The Abaris Group calculated that it could only handle on average an additional 2.7 new admissions per day before hitting the 85 percent occupancy level. This is far less than the 50.5 per day (18,426 patient days/365 days) needed to support the new volume from DSP.

The remaining med/surge admissions would have to be distributed to neighboring hospitals inside and outside of Contra Costa County. However, this calculation does not take into account the current growing demand at these existing hospitals and their ability to staff these beds nor would it necessary assure that unused beds would be placed into service. In addition, ED admissions at DSP only account for approximately 83 percent of the hospital's admissions with the remaining admissions potentially pre-empting admissions at nearby hospitals making the calculated ED admission space unavailable.

Exhibit 15: Beds and Utilization at Area Hospitals, 2009

Hospital Beds and Utilization, 2009						
Hospital	Beds	Available Bed Days	Patient Days	Number of Admissions	Length of Stay[1]	Occupancy Rate[2]
Doctors Medical Center San Pablo						
Med/Surg	154	56,210	18,426	4,390	4.2	44.4%
ICU	35	12,775	5,365	1,903	2.8	42.0%
Kaiser Foundation Hospital - Richmond						
Med/Surg	42	15,330	7,945	2,115	3.8	60.8%
ICU	8	2,920	2,194	498	4.4	75.1%
Alta Bates Summit Medical Center - Alta Bates Campus						
Med/Surg	146	53,290	32,955	7,454	4.4	72.6%
ICU	30	10,950	5,802	1,668	3.5	53.0%
Alta Bates Summit Medical Center - Hawthorne Campus						
Med/Surg	301	109,865	49,572	10,953	4.5	55.2%
ICU	36	13,140	10,386	2,776	3.7	79.0%
Children's Hospital and Research Center at Oakland						
Med/Surg (Pediatric)	111	40,515	33,032	8,315	4.0	91.7%
ICU	23	8,395	6,755	1,729	3.9	80.5%
Sutter Solano Medical Center						
Med/Surg	60	21,900	10,796	2,806	3.8	62.1%
ICU	12	4,380	3,439	1,012	3.4	78.5%
Kaiser Foundation Hospital - Rehabilitation Center Vallejo						
Med/Surg	160	58,400	38,755	8,846	4.4	76.1%
ICU	19	6,935	5,612	1,592	3.5	80.9%
Total Hospital Beds including Doctors San Pablo						
Med/Surg	974	355,510	191,481	44,879	4.3	53.9%
ICU	163	59,495	39,553	11,178	3.5	66.5%
Total Hospital Beds without Doctors San Pablo						
Med/Surg	820	299,300	191,481	44,879	4.3	64.0%
ICU	128	46,720	39,553	11,178	3.5	84.7%

Note: ICU includes Coronary Care Units where applicable (Alta Bates Summit Medical Center - Alta Bates Campus and Kaiser - Vallejo).

1. The ICU LOS includes intra-hospital transfers; e.g., a patient that was admitted to the ICU and later transferred to another unit before discharge.

2. The Med/Surg occupancy rate includes patients admitted to the ICU and later transferred to the med/surg unit.

Source: OSHPD, Annual Utilization Reports, 2009

EMS System/Major Emergencies

As indicated previously, the negative impact on the ambulance delivery system would likely be substantial if the ED were to close altogether.

AMR provided 59,847 ambulance transports countywide during 2010. The West County contributed to 16,127 of these transports, or 27 percent. The number transported to DSP in 2010 was 7,316 (or 12.2 percent of total county transports).

AMR will experience longer transport times to farther EDs and additional time returning to their service area. AMR's contract calls for a performance standard of an 11:45 response with 90 percent compliance (10:00 for Richmond due to no ALS first response). For AMR to maintain that performance standard they will be required to add ambulances to compensate for the longer transport times.

During the 2004 report, the number of West County unit hours (number of ambulances on duty per hour) was 852 per week. To continue to meet the county contract performance standard, AMR calculated that it would take more than 300 unit hours per week for a total number of 1,189 unit hours per week for the West County. This would most likely exceed $2 million annually. Any new cost would only be offset by a small amount of new revenue by charging for each mile. There would likely be a shortfall in revenue to offset these costs. Increasing rates would most likely offer only a marginal return and more creative approaches to cost control and the EMS system may be required. Examples may include allowing ambulances to transport low acuity patients to clinics instead of EDs (which would require a change in state law) and a more sophisticated 9-1-1 call screening and triage protocol (e.g., nurse triage) to reduce the total number of ambulance requests.

There are additional concerns. First, higher ED volume at Kaiser Richmond or other facilities could lead to extended off-load times for EMS, resulting in additional costs. Second, a current industry challenge is paramedic recruitment with the EMS industry experiencing a significant shortage similar to the nursing crisis. Third, the current fire and ambulance delivery plan for Contra Costa County assumes some cost savings countywide and the reduction of AMR resources helps fund the fire advanced life support (ALS) first response program. While no cost savings were projected from the West County to support this plan, adding new resources was also not anticipated and this may have an unexpected consequence on the overall countywide plan.

Another possible consequence is first responder impact. On occasion, a fire first responder will assist the ambulance by riding to the hospital to support the care of a more complicated patient. One fire department told The Abaris Group during the 2004 report that they use a 20-minute total call for a unit to return to service. The impact today of this present resource use is minimal but this could change if ambulances are transporting to more distant EDs and the fire first responders are out of service for a longer period of time than 20 minutes. There would be an unspecified potential impact on the air medical providers in the region that may be requested to transport a higher number of patients.

In addition, a reduction of resources at DSP would have a significant impact on the availability of health care in the event of a major emergency for the West County. Such major emergencies are not unheard of. The oil refineries have had two such events in the past 15 years, one of which led to 3,000 patients being treated at local EDs in a single day. The area is also prone to earthquakes, flooding, and major vehicle crashes; because of the boundaries (e.g., water, Berkeley Hills) that frame the region, there is likely to be limited access to other regional emergency providers during a major emergency.

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