Attachment A

Stroke Centers for San Mateo County

Approximately 700,000 Americans suffer a stroke each year; of this number approximately 164,000 are fatal. Stroke survivors are frequently left with severe disabilities.

A stroke is caused by an interruption in the circulation of blood to the brain. Approximately 80% of strokes are caused when a blood vessel is blocked by a blood clot preventing an area of the brain from receiving its blood supply; these are called "ischemic strokes." The remaining 20% are the result of a burst blood vessel causing bleeding into the brain; these are called "hemorrhagic strokes." The symptoms of both types of strokes are similar so it is hard to differentiate them without a CT scan. Stroke symptoms can include muscle weakness or paralysis on one side, facial droop, dizziness, headache, slurred speech, double vision, partial vision loss, loss of coordination, and unconsciousness.

Until recently there was very little medical intervention for acute stroke. Treatment for patients surviving a stroke was focused on rehabilitation such as physical and speech therapy. Recently there have been major medical advances in stroke treatment. For many stroke victims, if the patient gets medical care quickly enough, brain damage can be avoided or at least minimized. These treatments include intravenously administering a "clot-busting" drug, tissue-type plasminogen (t-PA), as well as invasive procedures in which small catheters can be inserted to the site of the blood clot to remove it or to inject the t-PA directly into the clot.

Time is critical to the success of these new treatments. In order for intravenous t-PA to work it must be given within three hours of the onset of symptoms. The invasive procedures can be successful up to 8 hours from the onset of symptoms. Before t-PA is given it is important to determine whether the patient is having an ischemic or a hemorrhagic stroke. Giving t-PA to a patient with a hemorrhagic stroke will increase bleeding into the brain, making the stroke worse. Physicians are able to differentiate the stroke type by CT scan.

Although t-PA has been available for some time it has not always been administered. Papers published in medical journals three years ago report that only two to three percent of strokes caused by blood clots were treated with t-PA. This may be due to a delay in the patient seeking care, a delay in making the diagnosis in the emergency department, or reluctance to give t-PA on the part of the emergency department physician without the concurrence of a neurologist, who may not be readily available.

In 2000 a multidisciplinary group of representatives from major professional organizations involved with delivering stroke care, the Brain Attack Coalition

(BAC), concluded that stroke care could be improved through the implementation of a system of stroke care. This system would include both primary and comprehensive stroke centers.

According to the BAC, Primary Stroke Centers offer acute stroke teams, stroke units, written care protocols, available CT scan interpretation, and rapid laboratory testing. Comprehensive Stroke Centers offer these services plus the ability to perform the invasive procedures described above.

The Joint Commission on Accreditation for Healthcare Organizations (Joint Commission) has implemented a process for hospitals to receive accreditation as a Primary Stroke Center. The Joint Commission's standards for Primary Stroke Centers are based upon the BAC recommendations. Hospitals interested in receiving this accreditation make application to the Joint Commission, submit policies/procedures and data, and then the Joint Commission makes a site visit to the hospital

In 2005 the BAC published recommendations for Comprehensive Stroke Centers. The Joint Commission has not yet established a process for accreditation for Comprehensive Stroke Centers.

Health Department staff have been meeting with local hospitals for over two years regarding the feasibility of establishing Primary Stroke Centers in our County. The EMS Program's Medical Advisory Committee and Emergency Medical Care Committee both support a stroke center system for San Mateo County. Four hospitals that receive ambulance patients from San Mateo County have achieved Joint Commission Primary Stroke Center accreditation (Kaiser Redwood City, Mills-Peninsula Hospital, Seton Medical Center, and Stanford). Patients presenting with acute stroke symptoms, who normally receive their medical care at a non-stroke center hospital, will be taken to an accredited stroke center.

At this time both Stanford and Kaiser Redwood City have the capability of performing the invasive procedures recommended by the BAC for Comprehensive Stroke Centers. Mills-Peninsula Hospital and Seton Medical Center may be able to offer these procedures in the future.

As described earlier, time from the onset to treatment is critical for acute stroke victims. For intravenous t-PA to be effective it must be given within the first three hours of stroke symptoms. Within three hours from the time the symptoms begin the following actions must occur:

1. The patient must recognize the symptoms and seek medical care in an emergency department.
2. The patient must travel to a hospital emergency department.

3. The emergency department physician must take a patient history, examine the patient, and make an acute stroke diagnosis.
4. A CT scan must be done.
5. The CT scan must be interpreted.
6. If the CT scan diagnosis is ischemic stroke, an intravenous line must be started and the t-PA administered.

If the patient cannot receive t-PA within the first three hours, invasive procedures can be successful if they are done within 8 hours from the onset of symptoms.

We are proposing a stroke system that will direct 9-1-1 ambulances to take patients to a Primary Stroke Center if their onset of symptoms is within 2.5 hours. If the patient's symptoms are more that 2.5 hours but less than 8 hours in duration the patient will be taken to a Primary Stroke Center with the capability to perform the invasive procedures (presently Stanford or Kaiser Redwood City).

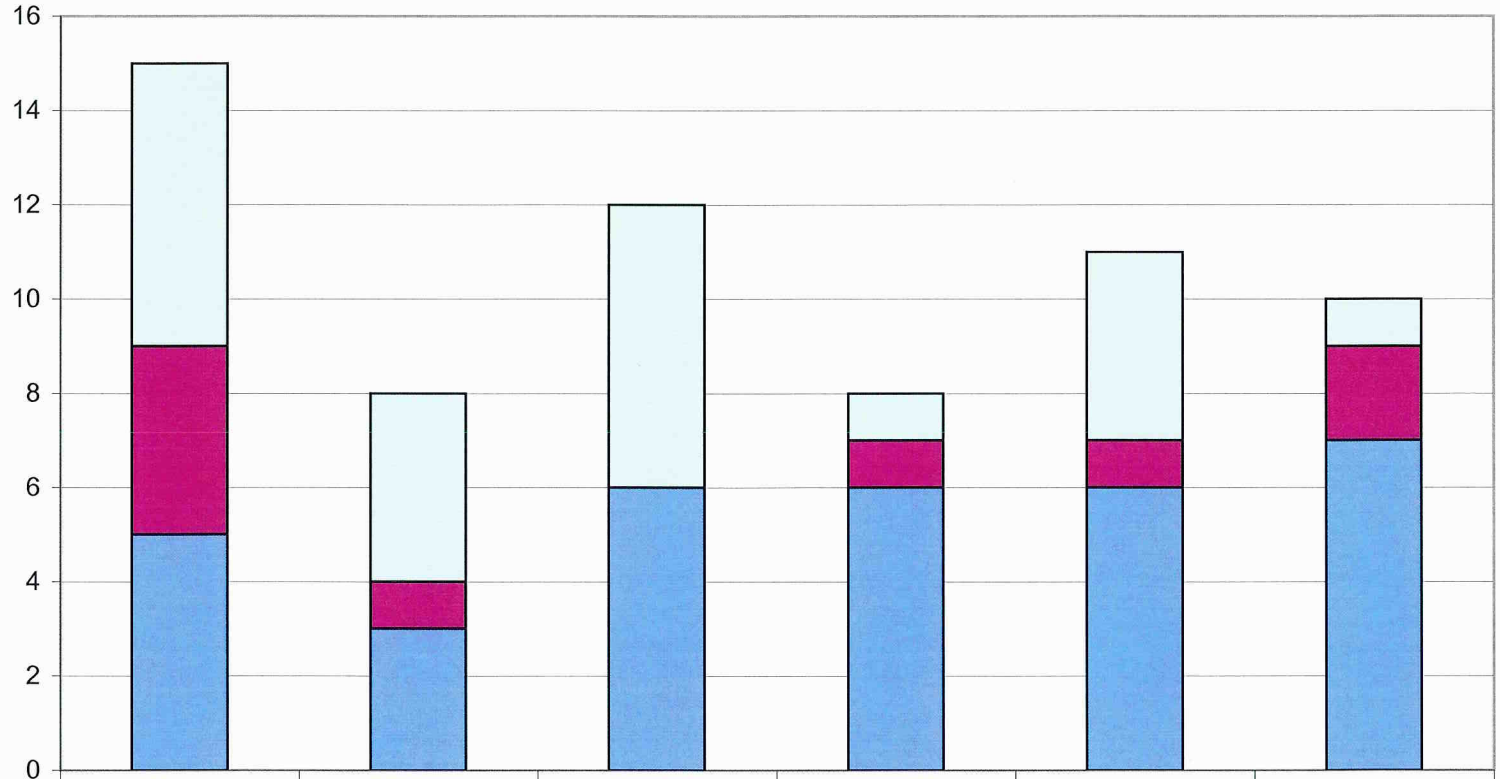
Early in our planning process in 2004, we reviewed two months of 9-1-1 stroke patients and determined that most of these patients (58%) accessed the 9-1-1 system in less than one hour of onset of symptoms. Additionally, 74% accessed the 9-1-1 system within 2 hours. Recently we repeated our analysis by examining 9-1-1 ambulance patient care records for 6 months (October 2006 through March 2007). A graph showing the number of patients presenting with stroke symptoms and the length of time since the onset of symptoms is attached.

Local hospitals report that a substantial number of stroke patients travel to emergency departments by car and many of these arrive long after the three hour t-PA window. A public information campaign aimed at educating the public to recognize stroke symptoms is needed as we implement the San Mateo County stroke system. Having stroke centers will be of no benefit to our residents if stroke symptoms go unrecognized or if the patient does not arrive at the stroke center within the necessary treatment window. We plan to communicate with the media and to prepare educational materials for the public. Messages will focus on:

- Emphasizing that disability caused by stroke can be prevented or mitigated if the patient seeks rapid medical treatment
- Recognizing stroke symptoms
- Calling 9-1-1 if a stroke is suspected

We believe that the residents of San Mateo County will benefit from a two-tiered stroke system. Now that medical treatments are possible that can prevent the devastating damage that strokes can cause if they are performed quickly enough, it makes sense to implement a stroke system of care in San Mateo County.

Onset times of potential stroke patients transported in San Mateo County between October 2006 and March 2007



	OCT	NOV	DEC	JAN	FEB	MAR
System Total	15	8	12	8	11	10
Greater than 8 Hours	6	4	6	1	4	1
Between 3 and 8 Hours	4	1	0	1	1	2
3 Hours or Less	5	3	6	6	6	7