

Quality and Productivity Commission
33rd Annual Productivity and Quality Awards Program
"Empowering Innovative Solutions"

2019 APPLICATION

Title of Project (Limited to 50 characters, including spaces, using Arial 12 point font):

NAME OF PROJECT: LOS ANGELES COMPREHENSIVE STROKE CENTER SYSTEM

DATE OF IMPLEMENTATION/ADOPTION: **JANUARY 8, 2018**

(Must have been fully implemented for a minimum of at least one year - on or before July 1, 2018)

PROJECT STATUS: Ongoing One-time only

HAS YOUR DEPARTMENT PREVIOUSLY SUBMITTED THIS PROJECT? Yes No

EXECUTIVE SUMMARY: Describe the project in 15 lines or less using Arial 12-point font. State clearly and concisely what difference the project has made.

1 In December 2015, Los Angeles County (LAC) EMS Agency organized a group of
 2 stakeholders to implement a two-tiered stroke system, which included identification and
 3 transport of patients with severe strokes to Comprehensive Stroke Centers (CSCs).
 4 The impetus for the program came from compelling data demonstrating markedly
 5 improved outcomes for patients with severe strokes when treated with an advanced
 6 procedure called thrombectomy (i.e. direct removal of a blood clot in the blood vessels
 7 of the brain), only available at CSCs. Planning involved collaboration between the EMS
 8 Agency, 29 EMS Provider Agencies (fire departments), the Hospital Association of
 9 Southern California, DHS leadership, public/private hospital leadership and their stroke
 10 neurologists and neuro-interventionalists. With the goal of increasing access to these
 11 life-saving therapies, we developed a unique Bridge Program allowing thrombectomy-
 12 capable centers to be designated as CSCs based on the standards set forth in a
 13 Request for Application process and onsite verification by EMS Agency staff, while
 14 awaiting national certification. This resulted in an increase in CSCs from 3 to 19 centers
 15 in 2018 and formed the first fully regionalized two-tiered stroke system in the U.S.

BENEFITS TO THE COUNTY

(1) ACTUAL/ESTIMATED ANNUAL COST AVOIDANCE	(2) ACTUAL/ESTIMATED ANNUAL COST SAVINGS	(3) ACTUAL/ESTIMATED ANNUAL REVENUE	(1) + (2) + (3) = TOTAL ANNUAL ACTUAL/ESTIMATED BENEFIT	SERVICE ENHANCEMENT PROJECT
\$ 0	\$ 0	\$ 432,548	\$ 432,548	X

ANNUAL = 12 MONTHS ONLY

SUBMITTING DEPARTMENT NAME AND COMPLETE ADDRESS
 Los Angeles County Emergency Medical Services Agency
 10100 Pioneer Blvd, Suite 200
 Santa Fe Springs, CA 90670

TELEPHONE NUMBER
562-378-1604

PROGRAM MANAGER'S NAME
Cathy Chidester

TELEPHONE NUMBER
562-378-1604

EMAIL
cchidester@dhs.lacounty.gov

PRODUCTIVITY MANAGER'S NAME AND SIGNATURE
(PLEASE CALL (213) 893-0322 IF YOU DO NOT KNOW YOUR PRODUCTIVITY MANAGER'S NAME)
 Connie Salgado-Sanchez

DATE
6-3-19

TELEPHONE NUMBER
213-288-8483

C. Salgado-Sanchez

EMAIL
COSanchez@dhs.lacounty.gov

DEPARTMENT HEAD'S NAME AND SIGNATURE
Christina Ghaly *Chaly*

DATE
6-3-19

TELEPHONE NUMBER
213-288-8101

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1st FACT SHEET – LIMITED UP TO 3 PAGES ONLY: Describe the **challenge(s), solution(s), and benefit(s)** of the project to the County. What quality and/or productivity-related outcome(s) has the project achieved? Provide measures of success and **specify assessment time frame.** Use Arial 12-point font.

In the development of a Comprehensive Stroke system, there were a number of challenges. These challenges centered around the gap between the existing resources and the need for access to comprehensive stroke care services across Los Angeles County (LAC). Challenges included: 1) identifying existing resources and enhancing resources within the County to provide comprehensive stroke care, especially beyond normal business hours Monday through Friday; 2) establishing uniform criteria for comprehensive stroke center designation in LAC, given multiple certifying bodies and recognized levels of stroke care; 3) determining a process for evaluating each hospital's capabilities to perform such services prior to review by an established certifying body and to fairly and equitably apply the standards to allow for designation of the Comprehensive Stroke Centers (CSC); 3) gaining system-wide acceptance of this designation and re-routing plan; 4) establishing a Request for Application Process and developing contracts for designated centers in collaboration with DHS Contract and Grants division and County Counsel; 5) training the over 4,000 Emergency Medical Services (EMS) providers (paramedics) and 800 Base Hospital personnel in stroke identification, stroke severity assessment, and transport/destination procedures; and 6) establishing an implementation plan for the Comprehensive Stroke System that informed our 73 9-1-1 receiving centers, Base Hospital personnel, EMS Provider Agencies, neighboring local EMS Agencies, and community leaders of the new system structure and the timeline for implementation.

Although LAC EMS had previously designated 50 Stroke Centers, all but three of these stroke centers were Primary Stroke Centers and had not been certified to provide comprehensive stroke care. The first challenge was to identify current resources and to determine if there was interest to develop these resources further. At the EMS Agency, we conducted a survey of all stroke centers and found that at least 12 centers were developing or already had the capabilities to provide comprehensive stroke care. We then reached out to each of the organizations that certify stroke centers (e.g., The Joint Commission) to build awareness of our need to expand these resources. We requested that these organizations work with the interested hospitals in LAC to promote understanding of the certification requirements and the process to obtain timely certification. Even so, awaiting certification prior to designating CSCs would have delayed system development by several years, delaying patients' access to this proven therapy. Therefore, we developed an internal process to ensure that all hospitals seeking designation as CSCs in LAC met a uniform standard and could provide the same level of resources and patient care,

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such that we could confidently route patients with severe stroke to these centers for comprehensive stroke care that would be available 24 hours a day, seven days a week. This required working closely with the certifying organizations and local hospital leadership and stroke experts to get universal buy-in and ensure total transparency and equity in the process.

Previous research performed in our County allowed for development of prehospital protocols which provided the tools for paramedics to first identify a patient with a stroke and secondly to identify those with severe stroke that could be transported selectively to CSCs. EMS Agency staff then trained all EMS provider agencies paramedics in the recognition and categorization of stroke patients in anticipation of the expansion of the stroke system capabilities. Paramedics now can identify patients with a severe stroke and route to the appropriate level of stroke center, whereas prior to implementation, these patients were routed to the closest stroke center which may not have had the resources in place to provide the definitive care for these patients resulting in need for secondary transfer and hours of delay in treatment. Finally, we ensured a process to evaluate the impact on patient outcomes. We did all of this over a period of 2 years, in close collaboration with our system stakeholders.

The result was a dramatic increase in access to comprehensive stroke care and life-sparing interventions in LAC. At the LAC EMS Agency, we collect data on all stroke patients transported to our designated Stroke Centers. In 2017, over 7,000 patients were transported for stroke care, yet few patients would have had access to comprehensive stroke care. When we evaluated our system pre- and post-implementation of the comprehensive stroke system we found that only 40% of the public had access to comprehensive stroke services within a 30-minute transport window before implementation whereas, after implementation, 93% of the public had access to these life-saving services with the same 30-minute transport window. This means that nearly 6 million additional people in LA County, should they suffer a severe stroke, now have access to comprehensive stroke care. We demonstrated that patients with severe stroke were 2.5 times more likely to receive thrombectomy post implementation and that the need for secondary transfers were reduced by a third.

Overall, based on published literature for advances in stroke care, we have implemented a comprehensive stroke system throughout LAC, which serves as a model for other EMS systems nationally. Through innovation, we developed a process for the certification of thrombectomy capable stroke centers, which allowed for significant improvement in healthcare delivery. This program demonstrates the integral role that EMS plays in the health of the citizens of LAC and how through collaboration with health system stakeholders we are able to deliver optimal care for our patients.

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Linkage to the County Strategic Plan – 1 page only. Which County Strategic Plan goal(s) does this project address? Explain how. Use Arial 12 point font.

Goal I. Make Investments That Transforms Lives by enhancing our delivery of comprehensive interventions.

The CSC system implements a higher-level standard of services in which CSCs will provide neurosurgery and/or thrombectomy procedure capabilities 24 hours a day, 7 days a week, to significantly improve outcomes for patients and diminish the suffering and debilitating effects of acute stroke. These higher-level standards are designed to improve stroke patient care, while enabling the hospitals and the County to better target and track the affected population and meet the guidelines developed by the American Heart Association/American Stroke Association. The prehospital and hospital data collected from the CSCs will be used by the County to provide standardized stroke management reports and countywide statistical data for Hospitals.

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COST AVOIDANCE, COST SAVINGS, AND REVENUE GENERATED (ESTIMATED BENEFITS TO THE COUNTY): If you are claiming cost benefits, include a calculation on this page. Please indicate whether these benefits apply in total or on a per unit basis, e.g., per capita, per transaction, per case, etc. You must include an explanation of the County cost savings, cost avoidance or new revenue that matches the numbers in the box. Remember to keep your supporting documentation. Use Arial 12 point font

Cost Avoidance: Costs that are eliminated or not incurred as a result of program outcomes. Please indicate whether these are costs to the County or to other entities.

Cost Savings: A reduction or lessening of expenditures as a result of program outcomes. Please indicate whether these were expenditures by the County or by other entities.

Revenue: Increases in existing revenue streams or new revenue sources to the County as a result of program outcomes.

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\$ 0	\$1,283,310	\$ 432,548	\$ 1,715,858	X

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Hospitals who were selected as Comprehensive Stroke Centers signed a contract with LAC EMS Agency and are required to pay a fee each year to offset staff costs for management of the comprehensive stroke system, data analysis, and verification. The revenue is from the fees collected.

Based on recent research on cost savings, (Campbell BCV, et al: Endovascular thrombectomy for ischemic stroke increases disability-free survival, quality of life, and life expectant and reduces costs. *Frontiers of Neurology* 2019;8:1-7.) the average cost savings per patient is \$4,365. This includes cost of preparation, and therapy. Given an additional 294 procedures were done in 2018 compared to prior to system implementation, this results in an overall annual costs savings of \$1,283,310. We believe this number underestimates the true impact of system implementation but provides some framework in which to understand the cost savings implication to our system. In addition, each patient treated gains a minimum of 5 quality life years – so after implementation, patients gained a total of 1,470 life years.

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FOR COLLABORATING DEPARTMENTS ONLY

(For single department submissions, do not include this page)

DEPARTMENT NO. 2 NAME AND COMPLETE ADDRESS	
PRODUCTIVITY MANAGER’S NAME AND SIGNATURE	DEPARTMENT HEAD’S NAME AND SIGNATURE
EMAIL: _____	EMAIL: _____
DEPARTMENT NO. 3 NAME AND COMPLETE ADDRESS	
PRODUCTIVITY MANAGER’S NAME AND SIGNATURE	DEPARTMENT HEAD’S NAME AND SIGNATURE
EMAIL: _____	EMAIL: _____
DEPARTMENT NO. 4 NAME AND COMPLETE ADDRESS	
PRODUCTIVITY MANAGER’S NAME AND SIGNATURE	DEPARTMENT HEAD’S NAME AND SIGNATURE
EMAIL: _____	EMAIL: _____
DEPARTMENT NO. 5 NAME AND COMPLETE ADDRESS	
PRODUCTIVITY MANAGER’S NAME AND SIGNATURE	DEPARTMENT HEAD’S NAME AND SIGNATURE
EMAIL: _____	EMAIL: _____
DEPARTMENT NO. 6 NAME AND COMPLETE ADDRESS	
PRODUCTIVITY MANAGER’S NAME AND SIGNATURE	DEPARTMENT HEAD’S NAME AND SIGNATURE
EMAIL: _____	EMAIL: _____
DEPARTMENT NO. 7 NAME AND COMPLETE ADDRESS	
PRODUCTIVITY MANAGER’S NAME AND SIGNATURE	DEPARTMENT HEAD’S NAME AND SIGNATURE
EMAIL: _____	EMAIL: _____