**Quality and Productivity Commission**

# 30th Annual Productivity and Quality Awards Program

***"Heritage of Excellence"***

**2016 APPLICATION**

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

**NAME OF PROJECT: TELERETINAL DIABETIC RETINOPATHY SCREENING IN LAC**

**DATE OF IMPLEMENTATION/ADOPTION:** **JANUARY 2014**
(Must have been implemented at least one year - on or before July 1, 2015)

**PROJECT STATUS**: X Ongoing _____ One-time only

**HAS YOUR DEPARTMENT PREVIOUSLY SUBMITTED THIS PROJECT?** _____ Yes X 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.


Diabetic retinopathy (DR) is the leading cause of blindness among working-age adults in the United States, but blindness can be prevented in >90% of cases by prompt therapy. Unfortunately, due to barriers to access to care, rates of preventable blindness due to DR are substantially higher in LA County than in the general population. Wait times for retinal examinations for diabetic patients have historically been longer than 6-9 months and the annual screening rate for DR in 2013 was <40%. Teleretinal screening for DR (routine screening via retinal photographs taken with a fundus camera by ancillary staff in primary care settings) can create a more effective triage system for this population, allowing for earlier detection of disease and increasing the ophthalmologist's ability to provide crucial treatment. Of the 27,272 diabetic patients screened by our DHS Teleretinal DR Screening Program to date, 18,610 (69%) did not need a referral to eye clinic. Of the 5,183 (19%) that did need a referral for DR, the <5% that needed an expedited visit for treatment received it. The LAC DHS Teleretinal DR Screening Program has improved screening rates and decreased the backlog of diabetic patients with treatable disease slowly going blind while waiting for ophthalmic evaluation in LAC.


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 |
|---|---|---|---|---|
| **$ 1,316,690** | **$ -55,177** | **$ 555,610** | **$ 1,817,123** | ☒ |

**ANNUAL = 12 MONTHS ONLY**


**SUBMITTING DEPARTMENT NAME AND COMPLETE ADDRESS**
Los Angeles County Department of Health Services
313 N. Figueroa St.
Los Angeles, CA 90012

**TELEPHONE NUMBER**
213-240-8101

**PROGRAM MANAGER'S NAME**
Lauren Patty Daskivich

**TELEPHONE NUMBER**
310-614-9321

**EMAIL**
lpdaskivich@dhs.lacounty.gov

**PRODUCTIVITY MANAGER'S NAME AND SIGNATURE**
(PLEASE CALL (213) 893-0322 IF YOU DO NOT KNOW YOUR PRODUCTIVITY MANAGER'S NAME)
Gerardo Pinedo
SIGNATURE ON FILE

**DATE**
7/5/2016

**TELEPHONE NUMBER**
213-240-8104

**EMAIL**
gpinedo@dhs.lacounty.gov

**DEPARTMENT HEAD'S NAME AND SIGNATURE**
Mitchell H. Katz, M.D.
SIGNATURE ON FILE

**DATE**
7/5/16

**TELEPHONE NUMBER**
213-240-8101




***We Support Plain Language***

Title of Project (Limited to 50 characters, including spaces, using Arial 12 point font):
**NAME OF PROJECT: TELERETINAL DIABETIC RETINOPATHY SCREENING IN LAC**

**1st FACT SHEET – LIMITED TO 3 PAGES ONLY:** Describe the **Challenge, Solution, and Benefits** of the project. State clearly and concisely what difference the project has made. Use Arial 12 point font

**Challenge**: Diabetic retinopathy (DR) is a leading cause of blindness in US adults, affecting over 5.3 million Americans age 18 and older. However, effective treatments for diabetic retinopathy are available; in fact, a landmark study showed that severe vision loss from diabetic retinopathy can be reduced by up to 94% by effective and timely treatments with laser photocoagulation. Unfortunately, at least 40-45% of diabetics who may benefit from earlier detection and treatment of retinopathy are still not receiving this care nationwide. On average only 60% of diabetic patients in the US receive timely eye examinations, and studies of the urban safety net setting have shown annual eye examination rates for inner-city diabetic patients to be lower than 25%. This trend is exemplified by the Los Angeles County (LAC) health care system, where the screening rate for diabetic retinopathy in 2013 was <40%.

Failure to receive timely and appropriate care for diabetic retinopathy is a major problem for LAC, where it is the leading cause of blindness. The prevalence of diabetes in Latinos of predominantly Mexican ancestry (the majority of LAC patients) approaches 50%, and this population faces substantial barriers to access to care that prevent early identification and treatment of disease. Historically, wait times for retinal examinations for patients with newly diagnosed diabetes within the LAC safety net have been upwards of 6-9 months.

**Solution**: We found a solution to this problem in teleretinal screening for diabetic retinopathy (DR), which allows for routine screening via retinal images taken with a fundus camera by ancillary staff in primary care settings, with subsequent analysis by trained readers to determine presence and extent of disease. Previous studies have shown that digital retinal imaging can be an accurate and effective screening tool for diabetic retinopathy, with a high sensitivity and specificity when compared to both 7 standard field 35-mm ETDRS protocol fundus photographs and direct ophthalmoscopy by an ophthalmic physician. Teleretinal DR screening relies upon the proven technology of using fundus cameras to screen patients for diabetic retinopathy via retinal imaging. The placement of these cameras in primary care settings allows for patients to receive their screening within their Patient Centered Medical Home (PCMH), with only those with more advanced levels of disease needing a referral to an eye care provider. To provide timely results to participating primary care providers (PCPs) and to help ensure patients screened via this program obtain the appropriate follow up, we have integrated our teleretinal DR screening workflows with ORCHID, the new LAC electronic medical record. Once results of the retinal images are returned to the PCP with a provisional diagnosis and recommendations for follow up, PCPs then use eConsult (the new web-based DHS specialty referral system) to refer patients who need closer follow up or further treatment by an eye care provider in a triaged, timely fashion for scheduling into eye clinic appointments across the DHS system. This allows us to maximize the appointment availability across all facilities in the Los Angeles County Department of Health Service (LAC DHS) enterprise.

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The groundwork necessary for implementing this initiative included: ensuring clinic access to fundus cameras for 14 DHS primary care sites; working with clinics to identify fundus photographers (LVN/Certified Medical Assistant (CMA) level personnel) and training these photographers; establishing workflows for integration of this program into primary and specialty care services within DHS; developing a protocol for image evaluation and referral guidelines unique to LAC; creating a quality control system to continuously monitor image acquisition and evaluation; and establishing appropriate triage mechanisms and workflows for abnormal screening photographs. The teleretinal DR screening program, began in 2014, is steadily growing and when at full capacity will screen all empaneled diabetics in LAC safety net primary care clinics, translating into reads for at least 50,000 screens per year.

LAC DHS has provided critical project environmental infrastructure in the form of equipment and personnel, including the virtual reading center for the teleretinal images. All of these contributions have been made with an eye to sustainability, including the hiring of a program coordinator to assist in implementation and maintenance. Teleretinal DR screening both increases timely patient access to specialty care as well as efficiency of care for providers. We use this screening modality to improve detection of diabetic retinopathy and utilization of specialty eye care resources for our LAC DHS patients. Prior to our program, a system-level implementation of teleretinal DR screening, including appropriate ophthalmic follow-up care and definitive treatment, in a safety net population the size of that served by LAC DHS had not been achieved.

**Benefits**: As of May 31, 2016, the teleretinal DR screening program is up and running at 14 sites throughout LAC. Staff includes 53 retinal photographers that are currently uploading patient information using the web-based software platform, and 10 primary readers that are providing screening results via the DHS-wide Teleretinal Reading Center. Of 27,272 patients screened, 18,610 (69%) did not need a referral to an eye care provider and were removed from the queue waiting for eye clinic appointments. Of the 5,183 (20%) that did need a referral for DR, the <5% that needed an expedited visit for treatment received it. This information is summarized in quarterly dashboard reports to the LAC DHS community, showing the monthly volume and referral numbers at each facility. Prior to this program 100% of these patients were referred into the eye clinics for screening, waiting for 6 to 9 months or more for an appointment. After implementation of this program, the average wait time for DR screening decreased from 158 days to 17 days and the screening rate for DR in LAC DHS increased from <40% in 2013 to 52.8% in 2015.

This program fills a gap in services by leveraging existing resources in a new way. A key piece of the implementation plan for this project is sustainability, with the intent to permanently restructure the way diabetic patients are routinely screened for retinopathy in Los Angeles County. The patients with the greatest severity of

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**LINKAGE TO THE COUNTY STRATEGIC PLAN (DETAIL IS REQUIRED FOR COUNTY DEPARTMENTS):** Use Arial 12 point font

diabetic retinopathy have the narrowest window of opportunity to prevent irreversible vision loss, and the reduced wait time achieved by bringing retinal screening to the point of primary care is critical in identifying and treating the most at-risk patients. Teleretinal DR screening preserves the ophthalmologists' time for treatment and monitoring of those patients who have evidence of substantial retinopathy on their fundus photograph, as well as opening up appointments for other eye care needs. This is critical as the LAC demand for eye care services in general greatly surpasses the supply in both diabetic and non-diabetic patient populations.

This program optimizes use of a number of existing resources within the primary care system and has been augmented through successful grant applications that have secured equipment and evaluation capability. This program also utilizes emerging technology within LAC DHS, like the eConsult system described above. The strategic phased-in implementation of this program throughout the safety net system in LAC has enabled DHS to reach a large vulnerable population during a primary care visit. This is crucial for uninsured patients who often take an unpaid day off of work in order to see a physician and have many different health needs.

A key goal of the initiative is to have participating staff acting at the top of their skillset, with retinal photography performed by trained ancillary staff in the primary care setting, analysis of these photographs and subsequent triage done by optometry (with potential for incorporating future IT innovation such as automated grading), and treatment of those patients with operable disease by ophthalmologists. This is in direct accordance with Goal 1 of the County Strategic Plan, Operational Effectiveness/Fiscal Sustainability: Maximize the effectiveness of processes, structure, operations, and strong fiscal management to support timely delivery of customer-oriented and efficient public services, and is also linked to various aspects of Goal 2, Community Support and Responsiveness. Specifically, teleretinal DR screening is a unique approach to a specialty care access problem that maximizes the volume and timely delivery of specialty services to a high risk segment of our LAC DHS population.

Overall, primary care-based teleretinal DR screening substantially increases the quality, efficiency, and cost-effectiveness of care for diabetic eye disease in the LAC safety net, improving clinical outcomes by decreasing the eye clinics' backlog of diabetic patients and enabling us to prevent those with treatable disease slowly going blind while waiting for ophthalmic evaluation. This innovative approach to screening for diabetic retinopathy is both scalable and replicable in a way that could make LAC a model for other safety net healthcare systems across the nation.

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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. 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.

**Cost Savings**: A reduction or lessening of expenditures as a result of program outcomes.

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

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A goal of this program is to improve access to specialty care through use of technology operated by ancillary staff and use of all members of the team to the highest level of their skillset. The direct cost savings of this intervention result from increasing the number of diabetic persons screened in the lower-cost primary care setting while decreasing the overall number needing an in-person visit with an ophthalmologist.

We have done a detailed cost analysis of the program to calculate the cost of a teleretinal DR screen as compared to a dilated fundus exam by an optometrist. The comprehensive cost of each teleretinal screen done in 2015 (1 year after the program was begun) was $28.15. The cost of a traditional fundus exam in DHS by Optometry was $23.97. 13,188 screens were done in 2015, making the total cost of teleretinal DR screening to the County in 2015 $371,294. When this is compared to the cost of screening 13,188 patients via traditional in-person exam with an Optometrist, there is a loss of $55,177. However, this is an ongoing program so costs of an individual teleretinal screen will decrease with time as the volume of teleretinal DR screens increase (due to the higher but fixed technology investment at the start). Additionally, teleretinal DR Screening is a billable service for our patients, and we have set up this program to capitalize on this as a revenue source. Based on the 2015 numbers, this program would generate $555,610 in reimbursement. This amount surmounts the costs incurred by the program.

There is also significant cost avoidance that occurs from reducing the economic and social burdens of blindness in our population, which is fundamental to the value of this intervention. While this can be difficult to quantify, in 2011 the California Health Care Foundation published a report citing a Markov Model used to predict the mean expected benefit to the state of California per teleretinal DR screen over the lifetime of the patient ($768). Since our teleretinal DR screening program increased the DHS diabetic retinal screening rate 13% in 2015, we calculated the costs of blindness avoided by the state of California by that increase in screening rate. The cost of blindness to patients and families (and to state and county programs) is immense, reflected in this cost avoidance total of $1,316,690. We were not able to quantify the additional cost avoidance from decreased wait times to screening and treatment of the

patients that undergo teleretinal DR screening compared to the traditional method. There are also indirect costs to the patients that are avoided by not having to travel outside of their primary care PCMH for teleretinal DR screening, costs that would have been incurred had they been screened in eye clinic (often at another DHS facility).

Finally, we did not take into account in these calculations the cost savings generated by the time this program opens up for eye care providers to take care of other eye diseases by taking routine diabetic eye screens out of the queue waiting for eye clinic appointments. This is a key piece of the service enhancement component of this program, as it improves access to specialty eye care services for both diabetic and non-diabetic patients alike.