

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: OR 17 UTILIZATION BY THE HAND SURGERY SERVICE

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 Hand surgery is a high volume surgical service, which has been affected by the
 2 unavailability of operating room (OR) time, causing many patients to remain admitted for
 3 much longer than they ideally need to be. As hospital lengths of stay (LOS) and denied
 4 days increase, a huge financial burden falls on the County. In an attempt to accommodate
 5 the high volume of cases that need to be done, OR 17 was allocated to the hand surgery
 6 service on Mondays to increase OR availability. After this change, average hospital LOS
 7 for inpatient cases decreased by 1.04 ± 0.75 days, and the average time from admission
 8 to time of surgery decreased by 0.70 ± 0.39 days. Based on all-inclusive billing, the
 9 average cost of hospital stay for an inpatient hand surgery case before and after OR 17
 10 allocation was \$69,255.19 and \$56,183.43, respectively, which effectively reduced the
 11 cost of a hand surgery patient by \$13,071.76 per hospital admission. The total number of
 12 orthopaedic cases in OR 17 on Mondays before and after allocation was 11 (Jan 2018 to
 13 Aug 2018) and 71 (Sept 2018 to Apr 2019), respectively. In summary, allocating OR 17
 14 to the hand surgery team on Mondays has been in direct line with Strategy III.3 of the
 15 County Strategic Plan, financially benefitting the County greatly.

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
\$ 4,065,317.36	\$ 0	\$ 0	\$ 4,065,317.36	<input checked="" type="checkbox"/>

ANNUAL = 12 MONTHS ONLY

SUBMITTING DEPARTMENT NAME AND COMPLETE ADDRESS
 LAC+USC Department of Orthopaedics – Hand Service
 1200 N State St, Los Angeles, CA 90033
 Rachel Lefebvre, MD, Luke Nicholson, MD, Kurt Mohty, MD

TELEPHONE NUMBER
 323-409-7347

PROGRAM MANAGER'S NAME
 Stephen Sener, MD
 Associate Medical Director of Perioperative Services

TELEPHONE NUMBER
 323-409-7737

EMAIL
 ssener@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
 06/21/2018

TELEPHONE NUMBER
 (213) 288-8483

EMAIL
 cosanchez@dhs.lacounty.gov

DEPARTMENT HEAD'S NAME AND SIGNATURE
 Christina R. Ghaly, M.D.

DATE
 06/21/2019

TELEPHONE NUMBER
 (213) 288-8050

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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.

Intro: The orthopaedic hand surgery service is one of the most high-volume operating services at LAC+USC. Data from the Surgical and Anesthesiology Administration has shown that over 570 inpatient cases were performed since the beginning of the academic year in June 2018, and this number increases to over 1,070 cases when outpatient cases are included. In spite of the high volume of hand surgery service cases performed, the hospital course and discharge process of many patients with hand injuries has been limited by operating room (OR) availability. This challenge has resulted in a large number of patients waiting needlessly in the hospital due to inability to discharge-readmit (DCR) patients for a scheduled surgery date. This is largely due to the fact that many patients with hand injuries are not medically clear for discharge and require urgent surgery during the same hospital admission. Because of this, hospital length of stay (LOS) for hand surgery, patients can be inpatients unnecessarily longer than required, which poses a financial burden on the LAC+USC Medical Center; additionally, the amount of denied days increases. To combat this issue, OR 17 was allocated to the hand surgery service on Mondays to increase OR availability. This change implemented on Sept 10, 2018 sought to allow for more inpatient cases to be completed by the hand surgery service, which would ultimately lead to decreased average LOS for inpatients.

Methods: To determine the effect of OR 17 availability, data from the beginning of the academic year (June 1, 2018) to the present (June 1, 2019) were analyzed. Average LOS, time from admission to time of surgery, and average cost of hospital stay were determined for simple hand surgery cases as defined by inpatients requiring only one hand surgery case prior to discharge. A list of all orthopaedic surgery upper extremity cases from the above mentioned timeframe was obtained from Surgical and Anesthesiology Administration (n=1075 cases). This list was then screened for inpatient hand surgery cases by the following attending physicians: Dr. Ghiassi, Dr. Stevanovic, Dr. Brown, and Dr. Lefebvre (n=571 cases). Ideally only patients with isolated hand injuries would be included, which would have required screening through every patient's chart. Given the time available for project submission, this was approximated by removing patients whose hospital LOS was over two standard deviations from the average. Patients who required multiple hand surgeries during one hospital admission were excluded. According to revenue management, average cost of hospital stay for patients was calculated based on all-inclusive billing for which the cost of an orthopaedic patient is \$12,569.00 per day. Finally, Monday usage data of OR 17 by department from Jan 2018 to Apr 2019 was also obtained.

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Statistics: Averages, standard deviations, average differences, and standard deviations of the differences were calculated for hospital LOS and time from admission to time of surgery. An unpaired 2-tailed student t-test was used to compare the average hospital LOS and average time from admission to time of surgery from before and after OR 17 allocation. A p-value of less than 0.05 was considered statistically significant.

Results: 311 inpatient hand surgery cases were identified. 84 cases were before OR 17 allocation, and 227 cases were after OR 17 allocation (Table 1). Average hospital LOS for inpatient cases before and after OR 17 allocation was 5.51 ± 6.02 days and 4.47 ± 5.57 days, respectively (average difference of 1.04 ± 0.75 hospital days, $p = 0.17$). Average time from admission to time of surgery for inpatient cases before and after OR 17 allocation was 2.82 ± 3.07 days and 2.12 ± 2.87 days, respectively (average difference of 0.70 ± 0.39 hospital days, $p = 0.07$) (Fig. 1). Based on all-inclusive billing, the average cost of hospital stay for an inpatient hand surgery case before and after OR 17 allocation was \$69,255.19 and \$56,183.43, respectively (Fig. 2). The total number of orthopaedic cases in OR 17 on Mondays before and after allocation was 11 (Jan 2018 to Aug 2018) and 71 (Sept 2018 to Apr 2019), respectively (Fig. 3).

Table 1. Avg LOS, Avg Time from Admission to Surgery, and Avg Cost

	Before OR 17 Allocation	After OR 17 Allocation	Avg Difference	p-value
No. of Patients (#)	84	227	-	-
Avg Hospital LOS (days)	5.51 ± 6.02	4.47 ± 5.57	1.04 ± 0.75	$p = 0.17$
Avg Time from Admission to Time of Surgery (days)	2.82 ± 3.07	2.12 ± 2.87	0.70 ± 0.39	$p = 0.07$
Avg Cost of Hospital Stay per Case (\$)	69,255.19	56,183.43	$13,071.76 \pm 9,473.02$	$p = 0.17$

Conclusions: Allocation of OR 17 to the hand surgery service on Mondays trended towards reduced average hospital length of stay, average time from admission to time of surgery, and average cost of hospital stay for inpatients as can be seen in Figures 1 and 2. The hand surgery service has made prolific usage of extra OR time as demonstrated by the greater than 6-fold increase in amount of cases performed in OR 17 on Mondays during the eight months post-allocation as compared to eight months pre-allocation (Fig 3). This change may have saved the hospital approximately \$2,967,289.52 thus far based on the average difference in cost for the 227 identified inpatients after OR 17 allocation to the hand surgery service.

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Figure 1. Average Hospital LOS and Average Time from Admission to Time of Surgery before and after OR 17 Allocation

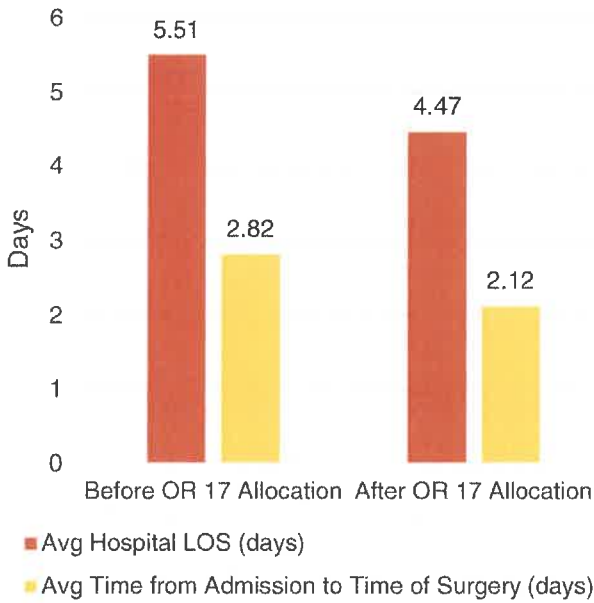


Figure 2. Average Cost of Hospital stay per Case before and after OR 17 Allocation

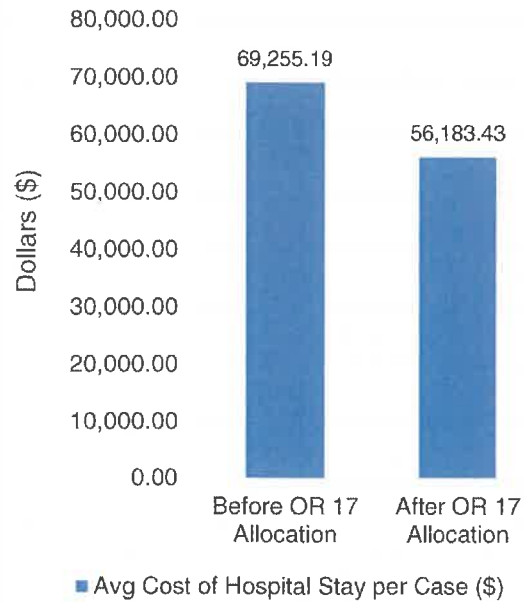
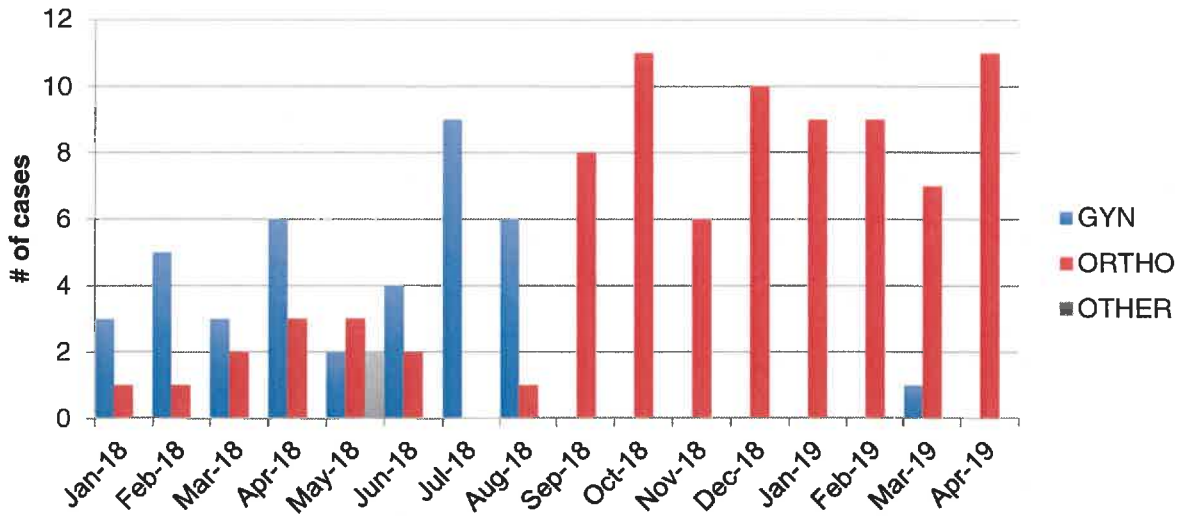


Figure 3. Total Number of Orthopaedic Cases in OR 17 on Mondays



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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.

This project largely addresses Strategy III.3 of the County Strategic Plan which seeks to “pursue operational effectiveness, fiscal responsibility, and accountability.” Resources are finite, and by properly organizing infrastructure, it is possible to optimize utilization of the limited assets available to hospital personnel. Ultimately, every attempt to improve quality measures in the hospital setting should also address the fiscal plausibility of the proposed change. We believe that OR 17 allocation to the hand surgery service on Mondays has made a profoundly positive impact on management and maximization of County assets directly in line with Strategic Plan III.3.2 which seeks to maximize the use of County assets and support economic development. Although this change has not led to a direct revenue increase (III.3.1), it does address hospital cost, which together with revenue are variables of profit. By allowing for more available OR time for the hand surgery service, fewer patients have lingered needlessly in the hospital waiting for surgery which has a direct impact on hospital length of stay, cost, and denied days. Therefore, we believe that allocating OR 17 to the hand surgery team on Mondays has been in direct line with Strategy III.3 of the County Strategic Plan which ultimately benefits the County system.

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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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\$ 4,065,317.36	\$ 0	\$ 0	\$ 4,065,317.36	<input checked="" type="checkbox"/>

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In a one-year period, 311 patients were identified for the study. As seen in Table 1 above, the average cost difference for simple hand surgery inpatient cases was $\$13,071.76 \pm 9,473.02$. Using an estimate of 311 simple hand surgery inpatient cases per year, this would imply an estimated cost avoidance of $311 \times \$13,071.76 \pm 9,473.02 = \mathbf{\$4,065,317.36} \pm 2,946,109.22$ per year (range of $\$1,119,208.14$ to $\$7,011,426.58$ per year).