

# FD CARES Innovative Analytics Project

Puget Sound Regional Fire Authority, Washington, USA

**A**t the forefront of innovation, FD CARES is dedicated to transforming fire department healthcare services by providing care coordination and in-home clinical services to stabilize patients at home or direct 911 callers to the most appropriate care. To evaluate the benefits of these services and identify future improvements, FD CARES used innovative analytics to prescribe improvements in delivery effectiveness and to reduce costs of care.

## THE CHALLENGE

The Puget Sound Regional Fire Authority (PSF) established FD CARES to better meet the needs of their community members and to improve the value of fire department healthcare services. To achieve this aim, FD CARES matches response times, apparatus, equipment, clinical team and services to 911 callers' non-emergent needs. The clinical team, including a firefighter/emergency medical technician, registered nurse and social worker, provide care coordination and deliver in-home clinical services to stabilize patients at home or direct 911 callers to the most appropriate care. FD CARES integrates these services into the broader social and healthcare services in the community such that people get the care they need, when they need it, in ways that are user-friendly, achieve the desired results and provide value.

PSF wanted to determine whether prescriptive analytics could be used to understand the impact of FD CARES' innovative non-emergent medical services (NEMS) approach on the Institute for Healthcare Improvement (IHI) triple aim objectives (improving the patient experience of care, improving the health of populations and reducing the per capita cost of healthcare) as it relates to community health management and in particular:

- Measure the value of FD CARES services in terms of cost efficiencies for the fire department and the community; and service utilization and patient experience
- Evaluate the impact of different changes to patient care pathways through FD CARES' services and its provider, payer and transportation partners (Molina Health, Premera Blue Cross, Tri-Med Ambulance and University of Washington Valley Medical Center)
- Model and prescribe further improvements to FD CARES program resource utilization, service delivery and cost efficiency

## THE SOLUTION

PSF engaged CGI for the FD CARES proof of concept (POC) analytics project. CGI worked with PSF to define the project objectives and evaluation metrics, design the methodology and conduct the analysis. Leveraging River Logic (RL) and its Enterprise Optimizer® (EO) platform, CGI and the FD CARES partners:

- Identified appropriate FD CARES data needed to describe the resource use, care utilization and interactions across the coordinated care continuum

## CASE STUDY

STATE AND LOCAL GOVERNMENT  
Health and Human Services

### About FD CARES



FD CARES was established in 2010 by a team of firefighters, healthcare providers and technology professionals at the Puget Sound Regional Fire Authority. It is dedicated to transforming fire department healthcare services to meet the needs of communities and partnering healthcare organizations. In addition to providing new in-home care services to direct 911 callers to the most appropriate care, FD CARES incorporates innovative analytics to identify how to drive improvements in delivery effectiveness, and reduce the costs of care across the region's fire department, payers, hospitals, urgent care clinics and primary care physicians.

- Designed a data-driven, constraint-based system model using sample data from FD CARES coordinated care partners
- Performed optimization and prescriptive analytics to measure the impact of FD CARES services and prescribe better ways to help maximize return on investment for FD CARES partners

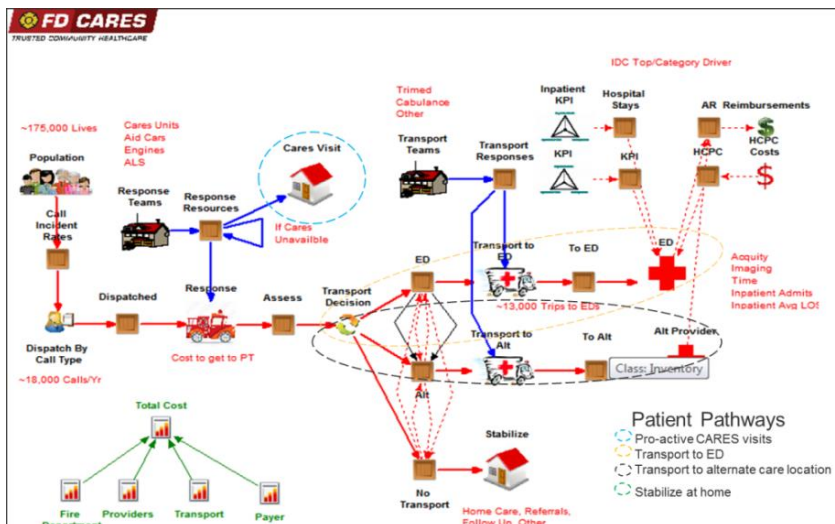
### Moving from “what if” to “what’s best”

Optimizing healthcare value requires a shift in using analytics from monitoring and reporting what has happened, to using prescriptive analytics mathematical modeling to identify ways of *improving future activities and results*. Prescriptive analytics for FD CARES were provided by the CGI Healthcare Enterprise Optimization solution which combines CGI’s deep healthcare domain expertise and best practices with RL’s EO engine to measure impacts, evaluate risks and identify optimal choices for decisions.

### Next-generation optimization

The CGI and RL team built an “intelligent model” based on FD CARES’ most important patient processes and the following patient flows:

- Transport to the emergency department (ED)
- Transport to alternate care location
- Stabilize at home
- Pro-active CARES visits



*“With CGI’s Healthcare Enterprise Optimization solution and expertise, the Fire Department gained new insights of the value of our community health management approach and enabled us to prescribe further improvements for better utilization of health services and lower costs of care.”*

**Mitch Snyder, Division Chief  
Puget Sound Regional Fire Authority  
EMS/FD CARES**

CGI and RL collected data for 911 calls, FD CARES NEMS responses, transportation, emergency admissions, billing and payment from PSF and its partners for 2015. For each 911 patient incident, the data was linked across data sources to create an “episode of care” and understand the resources used and service utilization across the patient flows. Incidents were grouped to common clinical categories and then proxy costs were assigned. Data was then loaded into the EO model to analyze key “what if” scenarios:

1. What is the value of the FD CARES innovative NEMS approach to community health management?
2. What if more non-emergent 911 patient incidents are directed to appropriate care?
3. What if appropriate non-emergent 911 patient incidents are directed to a sobering clinic?
4. What if appropriate non-emergent 911 patient incidents are directed to a mental health clinic?
5. What if FD CARES stabilizes more patients at home?
6. What if FD CARES increases proactive home services?

In an 18 month pilot study at PSF, preliminary data found that patients received a better experience of care and better continuity of care in their homes at lower costs. The FD CARES response resulted in stabilizing 53% of patients at home and transporting only 26% of patients to the hospital, an improvement over a traditional response of stabilizing 22% and transporting 67% of patients.<sup>1</sup> This information was used as the baseline in the POC for identifying additional benefits.







## THE RESULTS

The value of FD CARES' innovative NEMS approach to community health management was measured in terms of potential savings to PSF, savings to the health system partners as a whole, care utilization and patient experience. The POC demonstrated that FD CARES has a positive impact on the community it serves, while also improving operational efficiency and service delivery for PSF and its partners.

The outcomes were given an overall impact rating for each scenario. FD CARES' current and potential future benefits are shown in the table below and summarized as follows:

- Reduced costs to PSF by up to \$600,000 annually
- Reduced health system costs by up to \$1 million annually
- Improved health services utilization by reducing emergency department visits by up to 200 visits annually and associated diagnostic tests

### Summary of FD CARES Current and Potential Future Benefits\*

| Scenario  | FD Reduced Costs* | Health System Reduced Costs* | Improved Care Utilization  | Patient Experience                       | Overall Impact Rating   |
|---|-------------------|------------------------------|--|--|---|
| 1. What is the value of the FD CARES innovative NEMS approach to community health management?     | ↓ \$600 K         | ↓ \$1,000 K                  | ↓ 200 ED visits and 75 alternate care visits<br>↓ 150 X-ray, 20 MR, 110 CT | Lower experience of care at higher costs |  |
| 2. What if more non-emergent 911 patient incidents are directed to appropriate care?              | ↓ \$350 K         | ↓ \$600 K                    | ↓ 300 ED visits<br>↓ 130 X-ray, 10 MR, 100 CT                              | Better Experience of Care at Lower Costs |  |
| 3. What if appropriate non-emergent 911 patient incidents are directed to a Sobering Clinic?      | ↓ \$350 K         | ↓ \$500 K                    | ↓ 170 ED visits<br>↓ 40 X-ray, 0 MR, 40 CT                                 |  |  |
| 4. What if appropriate non-emergent 911 patient incidents are directed to a Mental Health Clinic? | ↓ \$350 K         | ↓ \$400 K                    | ↓ 160 ED visits<br>↓ 10 X-ray, 0 MR, 15 CT                                 | Better Continuity of Care                |  |
| 5. What if FD CARES stabilizes more patients at home?   | ↓ \$350 K         | ↓ \$600 K                    | ↓ 375 ED visits<br>↓ 160 X-ray, 12 MR, 120 CT                              |  |  |
| 6. What if FD CARES increases proactive home services?  | ↓ \$350 K         | ↓ \$550 K                    | ↓ 235 ED visits<br>↓ 210 X-ray, 10 MR, 120 CT                              |  |  |

Blue = some positive impact | Green = best positive impact | No significant changes found in the average scored of ED wait times, NYU score, Risk Score, ED LOS, IP LOS and Acuity.

\*Findings are directional in nature, not exact and are expected to be under-estimated due to the proxy calculation of costs based on the Centers for Medicare & Medicaid reimbursement rates and data quality gaps. Health system cost savings include lowered PSF costs. Cost savings could potentially be greater by 150% to 200% depending upon payer mix. Care utilization reductions assume that services were not required at alternative care sites.

The POC also identified the following:

- The opportunity value of providing additional services that direct 911 non-emergent responses to alternative care and stabilize 911 non-emergent responses at home
- The optimum volume at which additional proactive care visits can add financial benefit to PSF and improve health services utilization
- Programs that would have the least positive impact if implemented

**The bottom line:** This innovative analytics project succeeded in helping FD CARES to prescribe better outcomes and reduce the costs of care.

### ABOUT CGI

Founded in 1976, CGI is one of the largest IT and business process services providers in the world, delivering high-quality business consulting, systems integration and managed services. With a deep commitment to providing innovative services and solutions, CGI has an industry-leading track record of delivering 95% of projects on time and within budget, aligning our teams with clients' business strategies to achieve top-to-bottom line results.

### ABOUT RIVER LOGIC

Founded in 2000, River Logic is a privately held technology firm with corporate offices in Dallas, Texas. River Logic's Platform enables organizations and enterprises to make more impactful decisions and optimize overall business performance by understanding how to best utilize resources (both physical and intangible resources). Beginning as a leader in prescriptive analytics (optimization), River Logic is now the most competitive advanced analytics platform.

**For more information about the FD CARES analytics project, please contact:**

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<sup>1</sup> Six Month Outcomes Report, Puget Sound Regional Fire Authority, May 7, 2016