

## Case Study

Advanced  
Data  
Analytics and  
Machine  
Learning

# Leveraging Advanced Analytics and Machine Learning to Evaluate TeleCritical Care Program Effectiveness

Producing patient deterioration risk predictions and quantifying the impact of interventions to equip clinicians with data-driven insights to make informed treatment decisions for Veterans admitted to the Department of Veterans Affairs (VA) TeleCritical Care facilities.

## The Challenge

To enhance the effectiveness of VA critical care delivery, the National TeleCritical Care (TeleCC) Program has partnered with National Consulting Partners (NCP) and Cogitativo to utilize advanced data analytics and machine learning (ML) to generate novel categorization, prognostication, and management algorithms for acutely ill Veterans within TeleCritical Care. This analysis leverages the data resources available within the existing VA TeleCC database and VA Corporate Data Warehouse (CDW) to evaluate key metrics, including optimal disease and severity categorization, prognostication (death, hemodynamic stability, requirement for noninvasive or invasive respiratory support), and novel management strategies. The primary objectives include an evaluation of the impact of the TeleCC program on patient Length of Stay, Mortality, and utilization of community care services as well as the development and evaluation of predictive and causal capabilities for respiratory failure and sepsis/septic shock.

## Approach

Our approach leverages statistical analysis and linear regression techniques to evaluate program impact. For more advanced use cases, our team utilizes ensemble ML through Cogitativo's Visión platform to produce risk predictions for patient deterioration and causal modeling to quantify the impact of interventions at the individual and subpopulation levels. Using PowerBI, NCP is also creating data visualizations and dashboards to inform stakeholder planning, decision-making, and program optimization. These initiatives will equip clinicians with data-driven insights to make informed treatment decisions tailored to the individual needs of Veterans admitted to VA TeleCritical care facilities.

## Results

Our team has achieved several notable successes that underscore the potential impact of our AI and ML capabilities on healthcare for Veterans. One of our key achievements is the successful implementation of our solution within the Summit Data Platform. This strategic integration has enabled seamless interoperability with existing VA IT systems, particularly the VA electronic health record (EHR), thereby enhancing data flow and accessibility for users. By leveraging this robust platform, we have set a strong foundation for the future scalability and adaptability of our AI-driven insights.

Our research has demonstrated significant advancements in patient outcomes and cost efficiency through the VA TeleCritical Care. By leveraging advanced analytical techniques and machine learning models, NCP has shown that the presence of TeleCC in VA ICU units has markedly reduced the Length of Stay (LOS) for patients, resulting in a quicker recovery process and the efficient allocation of hospital resources. Additionally, the program has contributed to a substantial decrease in patient mortality rates, underscoring the critical role of timely and effective TeleCC interventions. From a financial perspective, the program has significantly lowered the overall costs associated with ICU care, offering a more sustainable and scalable model for the VA healthcare system. These findings underscore the TeleCC program's efficacy in enhancing patient care and operational efficiency compared to traditional VA ICU care.

## NCP Available Contract Vehicles

### GSA MAS

541611  
54151HEAL  
54151S

### Subcontractor to Vendors with Prime access to:

Alliant 2  
VETS 2  
VECTOR  
IHT  
T4NG / T4NG2

### SDVOSB SOLE SOURCE

An acquisition can be established as a sole source award for an SDVOSB by the Department of Veterans Affairs and other Agencies through VAAR Part 819.7008 Sole source awards to a verified service-disabled Veteran-owned small business.



## Contact Information

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