

CALLISONRTKL™

A hand is shown in silhouette, pointing towards a grid of medical MRI scans displayed on a screen. The scans are arranged in a grid pattern and are overlaid with a blue, semi-transparent grid. The background is a solid blue color.

COMMAND CENTERS

In Healthcare in the time of a Pandemic & Beyond



INTRODUCTION

The COVID-19 pandemic is putting the cohesiveness of our world to the test as well as our ability to share and coordinate critical information. Collaboration on an unprecedented scale is essential as we grow our understanding of the dynamics of the pandemic and enhance our ability to predict the future trajectory it will likely take. Working together will also be essential in developing countermeasures such as a vaccine or treatment methodologies that ease the effects of the virus as well as protective measures that mitigate potential surges in infections. Simply put, the more we share the closer the world will be to an effective clinical response—one we desperately need.

Serving as collaborative communication hubs, command centers in healthcare facilities are quickly becoming an essential operational ingredient to coordinate disparate clinical and non-clinical activities that are actively interdependent. This coordination, enhanced by artificial intelligence (AI), occurs within the much-needed data nexus, a place for information collaboration and operational decision support to seamlessly connect those interdependencies.

More and more, healthcare facilities are increasing reliance on information and communication technology systems that are both disparate and separate. The collection of data and its lack of interconnectivity has meant that data lacked collation into useful and coherent lines of activity better described as integrated activity units. The integrated activity units then combine in ways to address larger, more complex problems with relationships and interdependencies too complex to manage with conventional systems. Being composed of highly complex and dynamic organizations compelled healthcare facilities to develop a NASA-style command center to coordinate and manage all of the clinical and non-clinical activities.

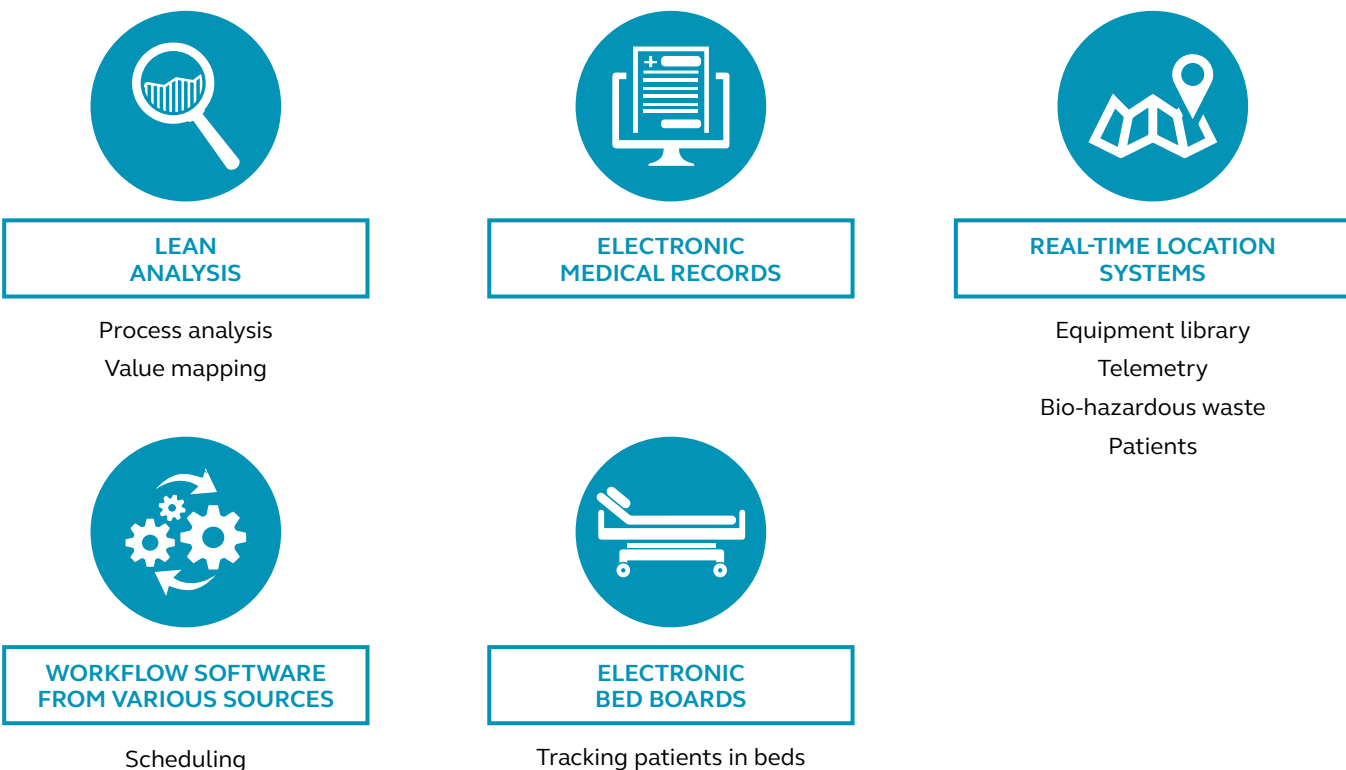
The ability to historically track events is essential for quality assurance at any hospital intent on identifying and rectifying conflicting demands whether they are scheduling of patients, finding essential equipment, patient safety, maintenance, materials movement, or housekeeping. The command center provides the next level of data collection and coordination to track and monitor all activities and events, boosting resiliency in the system.



Command Centre at Humber River Hospital

The command center provides a centralized control point for historic and real time predictive analytics that are collected from differing data sources (information and communication technologies) and coordinated to manage logistics, provide operational transparency and facilitate coordination improvement between clinical and non-clinical functions. It also extends to homecare strategies utilizing wearables and remote monitoring to give the healthcare facility the ability to detect and direct care to the patient at their time of need.

THE TOOLS AVAILABLE AND UTILIZED WITHIN HEALTHCARE FACILITIES INCLUDE:



CHARACTERISTICS

By coordinating information and communication technologies, the command center improves patient safety and the patient experience as well as the non-clinical support through holistic strategies that encompass visible and hidden aspects impacting the patient journey.

The increased use of AI will promote a more responsive prediction of the requirements encountered upon a patient's care journey, leading to more successful outcomes and better patient experiences. AI will help anticipate events and coordinate the needed staff movements to respond in a timely manner. As would be expected, timely responses from staff positively impact the patient care journey.

THE COMMAND CENTER WILL:

- 1 Be staffed and operated 24/7
- 2 Collect and collate all data sources, make relevant data visible and available ubiquitously (including mobile users)
- 3 Predict the patient journey and alert all activities in a timely manner to support the journey
- 4 Adapt to changing conditions by calculating the re-routing of the patient care journey in the most efficient manner
- 5 Collect and collate the resultant data from all patient care journeys to learn how to improve

The command center is best located in a convenient place closest to the epicenter of the healthcare facility that is easily accessible to all authorized staff but preferably not in the basement. For example, in Humber River Hospital the command center is located in administration which is at the physical center of the building, providing functional effectiveness and convenience to all staff.

The facilities management virtual operation should be integrated within the command center which can be remote from storerooms and other functional areas. With materials movement becoming more automated, it is becoming more imperative that it is coordinated with all clinical and other non-clinical activities to mitigate the potential impact to the patient care journey or its care team.

DESIGN CONSIDERATIONS

THE SIZE FOR THE COMMAND CENTER WILL NEED TO TAKE INTO CONSIDERATION:

- Number of workstations - to accommodate the required number of systems to be monitored and their use
- Number of wall mounted monitors – to accommodate the required number of systems to be monitored and their use
- Number of services/departments within the facility
- Conference room with videoconferencing
- Server room (for timely efficiency should be collocated with the Command Center)
- Access to staff amenities

The wall for the mounted monitors (Wall of Analytics) tends to be long – part due to the number of monitors present + future and the ergonomics for ease of viewing. This will tend to dictate at least one dimension of the room.

THE NUMBER OF WORKSTATIONS WILL BE DETERMINED BY THE AREAS OF REPRESENTATION DEEMED NECESSARY OR APPROPRIATE TO CONDUCT AND MONITOR THE ACTIVITIES WITHIN THE FACILITY SUCH AS:

- Bed Managers
- EVS Coordinators
- Transfer Leaders
- OR Schedulers
- Transport Coordinators
- Staffing Coordinators
- Logistics Coordinators
- Facility Management Leaders

To support the activities of the command center, consideration should be given for meeting/conference rooms, office/workstation for the command center supervisor within the body of the command center plus easy access to staff amenities including sanitary facilities and food services. Due to the 24-hour operation, consideration should be given to the provision of overnight accommodation.



DIGITAL TECHNOLOGY SERVICES

With the increased use of remote monitoring, coordinated action plans become increasingly necessary to ensure timely patient care when needed, this is particularly important in chronic care management. In a like manner, coordinating region wide services to create a virtual hospital capturing the many facilities bound by a single purpose – to serve the healthcare needs for the community – would give greater accessibility to all services and increase the effectiveness of the system to the community. Thus ensuring and ensure each healthcare service fulfills an unmet need, is fully utilized and completely integrated. The aim being to recognize and reduce waste in the provision of healthcare services.

It would be well advised to consider utilizing a system like Blockchain, where the information is undeniably accurate, but more secure to healthcare information protection standards. Blockchain technology can solve potential interoperability problems between the differing parts of a region's healthcare organizations. Blockchain can create decentralized record systems with multiple locations that can be shared with multiple entities in the healthcare system. In place of a single database, data that includes both clinical and financial input would be available in a transparent independent database still held in common with other data systems.



REMOTE MONITORING/ TELEHEALTH

Remote monitoring/telemedicine will become more effective and efficient when connected to a command center. The adoption of telemedicine technologies will play a much larger role in not only chronic health management but also with emergent/critical care management. Telemedicine places a large burden on communication systems, and these must also be planned with expansion in mind. This function would function best integrated within the command center since it is likely that these patients would have on-going care plans that would need to be included and coordinated within the healthcare system. Clinic appointments, material deliveries to the home and nurse/physician home visits would be coordinated within the command center to ensure the efficient and effective use of staff time and material delivery as well as patient transport when required. This will be a 24/7 service and as such would function best within the command center.

CONCLUSIONS

HEALTHCARE FACILITIES ARE INHERENTLY COMPLEX AND ARE ANALOGOUS TO THE HUMAN CONDITION.

Healthcare facilities are inherently complex and are analogous to the human condition. Historically, healthcare facilities relied on the human network to create the interconnectivity between things and generate lines of activity to focus and address healthcare needs. Unfortunately, this system can extend only so far after which more complex systems are required to collect and coordinate data into lines of activity which can more efficiently address the specific needs at present. More simply, the command center can collect data, organize it and implement the response, whether that be treatment planning, laundry, food distribution or operating room scheduling; leaving the clinicians time to focus on the most important function of the healthcare facility – patient care – essential even during times of extreme need.



BEAU HERR,

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Beau is a Senior Vice President at CallisonRTKL. He has a proven track record of successfully implementing facility planning and design with a diverse exposure to a variety of project types. He has been involved in medical facility design and project development around the world in markets including China, Japan, Korea, the UK and the United States, and has experience in all phases of the design process. Beau has a strong practical and theoretical foundation in implementing efficient and innovative design



MARIO SANCHEZ,

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Mario is an Associate Vice President with OneEQ. With more than 20 years of diverse experience in all aspects of IT systems construction, architectural integration and MEP infrastructure, Mario has delivered strategic solutions for some of the most recognized names in the industry, including Stanford Healthcare, Google, CHOC Children's Hospital, UCLA, California Institute of Technology and Chapman University. His technical and management expertise integrate into the robust service lines of OneEQ to deliver cutting edge and forward-thinking solutions

CallisonRTKL is a global architecture, planning and design practice. Over the last 70 years, we endeavor to improve health and wellbeing in all the places we live, work, shop, play, stay, heal and age. Our team of nearly 1,500 professionals around the world is committed to advancing our clients' businesses and enhancing quality of life