TeleTracking

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COGNITIVE LOAD IN CLINICIANS –
Opportunities to Ease the Burden

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EXECUTIVE SUMMARY

As care delivery becomes increasingly complex, caregivers face the challenges of managing higher patient loads, multiple systems and processes—while at the same time trying to deal with unpredictable staffing and competing priorities. To accomplish what's needed under this amount of pressure, they face an enormous cognitive load, which, if it becomes too high, can negatively impact patient care.

THIS PAPER OUTLINES HOW VISUALIZATION TOOLS CAN BE A POWERFUL ASSET TO HELP REDUCE COGNITIVE LOAD. THE ULTIMATE OUTCOME BEING:

01 Increased Efficiency

02 Better Care

03 Healthier Caregivers

04 Positive Patient Experience

INTRODUCTION

As healthcare professionals, we all know that delivering safe, effective, efficient patient care has always involved a significant number of complexities for caregivers and health systems. We also know that complexity has only increased due to pandemic-level patient load and acuity, which has also increased the intensity of care delivery and the demands on caregivers, in addition to handling ever-changing staffing challenges. When you add in the evolving regulatory and payment structures and increasing patient/family expectations, we find ourselves in the eye of the "perfect storm." This means that every day caregivers must manage the care of multiple patients at a variety of acuity levels, access and document patient information in multiple systems, and communicate with the care team and family members using a variety of tools and devices. While this workload has increased exponentially, a human being's ability to absorb and process massive amounts of information remains constant.

So even though caregivers are being bombarded with all these different stimuli, their primary responsibility remains to the the daily management and monitoring of the patients they're assigned to care for—while being ready to intervene the moment a patient's clinical condition changes. This responsibility alone [while still dealing with documentation, phone calls and team needs], requires caregivers to engage in highly complex cognitive processes—which includes making decisions based on situational awareness and personal experience in order to determine the best course of action for a patient. While there are certainly technology solutions to monitor a patient, a caregiver acts as the primary monitoring system and means of detecting complications and problems, and is in the best position to act quickly and minimize negative patient outcomes[1].

Monitoring patient care in this way also means that caregivers are constantly reorganizing priorities in an attempt to determine the types of patient care activities to provide at any given time. This constant shifting requires both the ability to process information and pull from their "personal storage" of information or locate that information in one or more of the multiple systems in place to help, such as computers, notes, whiteboards, EMR, etc. The number of times though that a caregiver has to shift their attention between these types of tasks is astounding. A study, *An Analysis of Nurses' Cognitive Work: A New Perspective for Understanding Medical Errors*, showed that RNs averaged 76.6 cognitive shifts during the average shift, averaging 9.3 cognitive shifts per hour —a conscious shift in thinking as they moved from working with one patient to another each time[1].

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1. Patricia Potter, Laurie Wolf, Stuart Boxerman, Deborah Grayson, Jennifer Sledge, Clay Dunagan, and Bradley Evanoff. An Analysis of Nurses' Cognitive Work: A New Perspective for Understanding Medical Errors, Advances in Patient Safety: From Research to Implementation (Volume 1: Research Findings) https://www.ncbi.nlm.nih.gov/books/NBK20475/

THE URGENT NEED FOR SOLUTIONS: ENSURING QUALITY CARE

Having to move between tasks increases the pressure on caregivers to not only execute and document the completion of both routine care and more acute treatment tasks in a timely manner, but also to complete new orders and respond to changes in the patient's condition. We know that if a patient has to wait, that wait time can contribute to less-than-optimal outcomes for the patient and the hospital itself in terms of safety, care, and satisfaction. Yet, we also know that these constant cognitive shifts are necessary to ensure that current patients continue to move safely along the continuum of care towards discharge, in order to open beds needed for incoming patients.

2. https://catalyst.nejm.org/doi/full/10.1056/CAT.21.0217
3. https://www.washingtonpost.com/opinions/2021/11/15/covid-19-is-taking-terrible-toll-nurses-they-deserve-much-more-help/?wpisrc=nl_sb_smartbrief

For example, consider these capacity and staffing challenges compounded by consequent stress to caregivers.

01 Even prior to the Covid-19 pandemic, greater than 90% of U.S. EDs found themselves stressed beyond the breaking point at least some of the time.[2]

02 Lack of capacity in the U.S. health system also promotes ED crowding and strains the staff, with the total number of EDs decreasing.

03 And if patients need to be admitted, inpatient bed capacity has also decreased by 27%, to 2.41 from 3.32 per 1,000 population.[2]

04 According to the Bureau of Labor Statistics, 426,000 workers left jobs in health care and social assistance in September 2020, while preliminary data indicate 589,000 quit this September (2021), a quit rate that is the highest since data was first collected two decades ago.[3]

COGNITIVE LOAD THEORY DEFINED

We've been talking about the stress that caregivers face. Let's start off by defining what cognitive load theory actually is. Cognitive load theory focuses on the aspect of human memory that includes sensory, working and long-term memory. Working memory can only process a limited number of information elements at any given time, which creates a ''bottleneck'' for learning new things. There are three types of cognitive load that impact working memory:

INTRINSIC LOAD: Associated with performing essential aspects of the task, such as sharing patient information during shift handoffs.

EXTRANEOUS LOAD: Associated with nonessential aspects of the task, such as having to search for information to complete a task.

GERMANE LOAD: Associated with the deliberate use of cognitive strategies that result in learning, such as increased understanding or adoption of a process as a result of integrating it with previous learning.

Considering the three load types, we know it's important to be aware of the interaction between the amount of cognitive load imposed by a given task, the caregiver's level of expertise, and the way they approach an issue at a given point in time. And this is where "mental effort" comes into play—which is the proportion of a caregiver's working memory capacity that is assigned to a given task. This mental effort varies directly with a caregiver's cognitive load and inversely with their freely available cognitive capacity.

THIS MEANS:

• The greater the number of activities happening simultaneously, the greater the expected impact on cognitive load.

• What is known as fragmentation occurs in working memory, due to the retrieval and combination of too many separate parts and pieces from the long-term memory. The working memory has issues combining all these elements, especially when dealing with time constraints and all of the other pressures in the working environment.

• If a task's demands still exceed a caregiver's working memory, then the intrinsic load should be reduced (by either simplifying the task or breaking it into parts).[4]

4. Cognitive Load Theory: Implications for medical education: AMEE Guide No. 86

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WORKLOAD AND RESOURCES: ESTABLISHING BALANCE

When a caregiver's excessive workload [and cognitive load] causes their stress to reach high levels, their performance can deteriorate—and the impact of that decreased performance means that patient outcomes can be affected due to unintended errors and/or oversights in care.

Potential negative impacts to patient wellbeing truly emphasizes the point that caregivers need to have mechanisms in place to reduce cognitive load in order to be able to provide the care patients need and deserve. One way of achieving this goal is by providing clear visualization of real-time information, in an easy to absorb format for caregivers—as opposed to having to search for patient status information, writing multiple reminder notes related to care needs and relying on outdated information.

Finding ways to reduce cognitive load—and the stress it generates—is also important because of the unprecedented overall staffing shortages the United States is currently facing and which are anticipated to only increase in the future. Quite simply, a lower number of caregivers means a higher workload for those who are caring for patients. As noted on sidebar, caregivers are dealing with so much more.

In summary, a myriad of situations and circumstances contribute to an increased cognitive load in caregivers, all with the potential for negative impact on patients, the caregiver and the organization. Recognizing these is the first step in reducing cognitive load.

5. https://www.medscape.com/slideshow/2018-lifestyle-burnout-depression-6009235

While what constitutes cognitive load varies from one person to another based on individual experience and threshold for stress, there are some commonalities among nursing teams:

01 Too many bureaucratic tasks (56 percent).[5]

02 Spending too many hours at work (39 percent).[5]

03 Increasing computerization of practice (24 percent).[5]

04 Feeling like a cog in a wheel (20 percent).[5]

05 Distractions from calls, texts, alarms and notifications lead to distraction, which has been shown to play a role in 75% of medical errors.[6]

06 Studies have also shown that cognitive overload is a cause in 80% of medical device user errors.[6]

THE ROLE OF HOSPITAL LEADERS

With this multitude of factors impacting the cognitive load of caregivers, hospital leaders must play a role in helping to reduce it.

Hospital leadership needs to be able to recognize the signs of cognitive overload among the caregivers they're responsible for and take active measures to reduce cognitive burden and its consequences. One way of doing this is by making vital, clinically relevant and actionable information highly visible, combined with the implementation of simplified clinical workflows that help reduce the interruptions that impact cognitive load, and consequently improve quality of care and patient safety.[6]

6. Clinician Cognitive Overload and Its Implications for Nurse Leaders

POTENTIAL FOR VISUAL MANAGEMENT AS AN APPROACH TO REDUCE CAREGIVER COGNITIVE LOAD

Every health system has communication protocols that everyone is expected to adhere to in order to help ensure efficient, effective operations. A key part of these protocols is the integration of visual technology solutions that are able to help ease the burden of memory [and cognitive load], provide patient information in an instant, and allow nurses and physicians to communicate seamlessly from location to location on mobile devices.

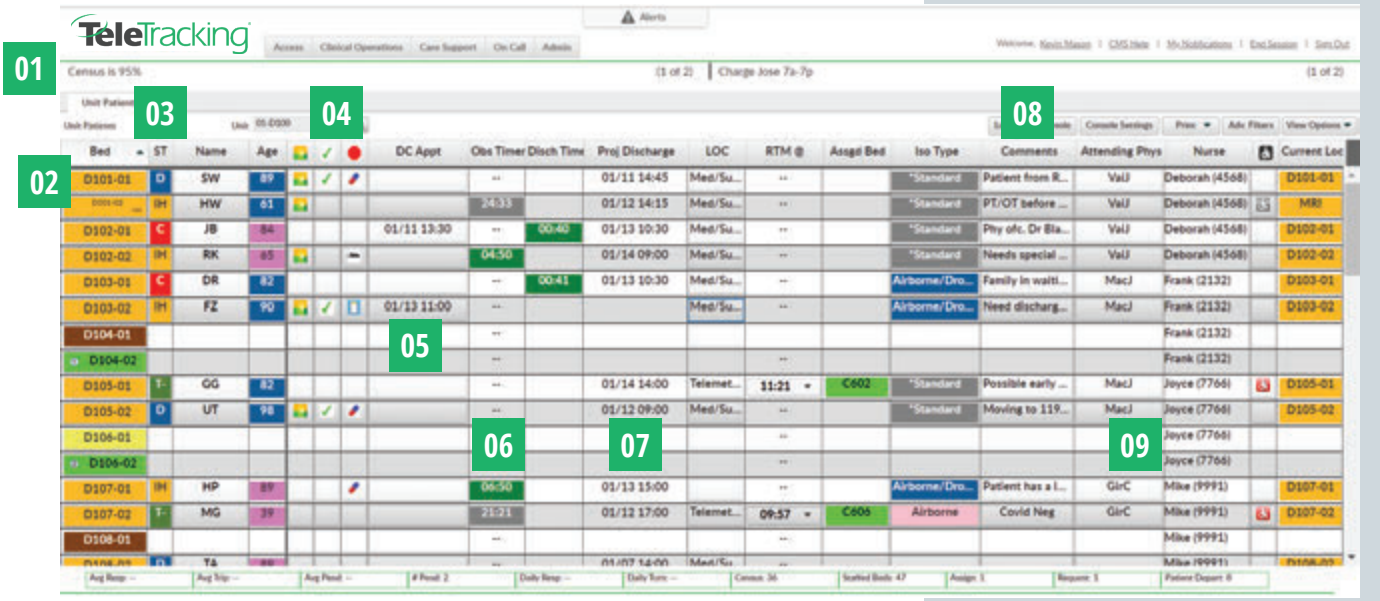
This type of standardization, which gives caregivers a comprehensive picture of both health system capacity and patient movement along their care journey, can be part of an overall strategy to positively address cognitive load. Furthermore, this type of comprehensive platform, with a strong visual component, helps simplify workflows and offload nurses' needs to retrieve, retain, and record information—making it easier to communicate and focus on their core responsibility of caring for patients.[6]

Caregivers who use visual management tools find better efficiencies around patient status and needs, increased communication and collaboration among staff, improved awareness and contribution to the patient's care plan and overall higher clinical engagement in patient safety and care quality. Together these benefits help reduce the risks of cognitive overload that result in challenges such as loss of information at shift change and inefficient patient tracking along the care continuum.[7]

Visibility is also helpful during rounding, huddles, and morning meetings. Having real-time patient care information at a glance empowers caregivers to address care needs while rapidly increasing timeliness of care, which leads to improved patient outcomes and overall experience.

For example, visual cues can act as a trigger for caregivers to hold certain medications based on NPO status, communicate patient risk for falls and patient status such as "anticipated discharge," so the care team knows

7 "Nurses' use of visual management in hospitals—A longitudinal, quantitative study on its implications on systems performance and working conditions"
8 Use of Electronic Visibility Boards to Improve Patient Care Quality, Safety, and Flow on Inpatient Pediatric Acute Care Units



the needs that must be met prior to discharge, and can plan and prioritize work for the day and follow up where needed.

In addition, this type of visibility also helps communicate safety considerations and team assignments, along with the other information that helps smooth the workload and overall patient flow in terms of discharges, admissions and transfers. When mobile is integrated, caregivers have the necessary information with them at all times. Setting up automated processes which includes visibility for services such as Transport and EVS reduces redundant work as well as stress.

Ultimately, the use of visual management makes it possible for the care team to appropriately care for the patient and address patient needs, resulting in fewer care delays and increasing the quality and safety of care.[8]

01. *Announcements or notices may be placed here for team awareness.*
02. *The 'Bed' column denotes the status of the bed – occupied, empty, dirty and the location of the patient – i.e. MRI.*
03. *Real-time patient status communicates to the hospital team the current/future patient state: in-house, confirmed discharge,anticipated discharge for today or tomorrow and transfer status*

04. *Attributes can be utilized to denote additional information – AM discharge, appropriate for discharge suite or pre-discharge needs to be met.*
05. *Date and time of discharge appointments can be added for team information and prep prioritization.*
06. *Timers are used to monitor length of time in observation status, discharge departure preperation and other key processes.*
07. *Projected discharge date/time visibility supports team prioritization and patient preperation.*
08. *Comments can be added to support patient DC prep, communicate movement, status, etc.*
09. *Patient care assignments can be added to communicate care contacts for the larger care team.*

ABOUT THE EXPERTS

KATHY S. MENEFEE, DNP, RN, NEA-BC, CPHQ
Managing Director, Advisory Services

Dr. Menefee brings extensive clinical and executive leadership experience to her role for TeleTracking Technologies. In addition to serving as a member of senior leadership, she has also led health system departments such as quality, service and safety, learning and organizational development, and process improvement. With experience in a variety of healthcare settings, Kathy is uniquely qualified to understand both patient and client needs, and align people, process and technology to meet those distinct needs.

MICHELLE SKINNER, BSN, MBA
Vice President, Strategic Client Management

As Vice President, Strategic Client Management at TeleTracking, Michelle brings 20+ years of measurable results in multi-network healthcare transformation, outreach and business development, patient journey optimization, bed management, patient flow and trauma certification preparation. Michelle's experience includes a demonstrated ability to increase patient volumes through market recapture, creating patient flow strategies for hospitals and healthcare systems, and working effectively with executives to drive change.

CHARLES HARRISON, BSN, RN, MBA
Work Flow Consultant

Charles Harrison brings more than 30 years of healthcare experience to his role as a Work Flow Consultant at TeleTracking. He has extensive expertise in assessing opportunities to eliminate hospital waste, establishing efficient workflows, analyzing workflows and assist clients in making workflow decisions to optimize patient flow efficiencies and training clients in using applications to analyze data to evaluate process opportunities. Prior to joining TeleTracking, Charles worked in direct patient care as a Bed Management Specialist and an Oncology Nurse.

TERRY WILLIAMS, ASB CSMS
Senior Application Consultant

Terry has over 40 years of IT experience supporting banking, elections, insurance, manufacturing, marketing, and real estate—with the past 18+ years spent supporting healthcare in both the private and public sectors. He brings an unmatched technical acumen to the projects he collaborates on and is recognized as an award-winning subject matter expert on the products within the TeleTracking Technologies portfolio. He has specific expertise in the throughput, care support, and enabling technologies suites of applications.

For more information

We are pleased to provide this overview of the power of visualization and how it can help reduce cognitive load for caregivers. To learn more about solutions that can have a positive impact on your health system operations, visit TeleTracking.com/CognitiveLoad.