

Creating A Wait-Free ED Experience

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Challenges In Matching ED Capacity to Patient Demand:

Fluctuating and Seasonal Patient Volume:

Such as flu season or summer months when accidents and heat-related illnesses are more common.

Unpredictable Events: Natural disasters, pandemics, or large-scale accidents can overwhelm ER capacity.

Staffing Issues/Shortages: There is a widespread shortage of healthcare professionals, including doctors, nurses, and support staff, which can limit the ER's capacity.

Burnout: High-stress environments and long hours can lead to burnout, reducing efficiency and increasing turnover.

Resource Limitations/Bed Availability:

Limited hospital beds can cause bottlenecks, leading to longer wait times in the ER for an inpatient bed.

Systemic Inefficiencies/Discharge Delays:

Delays in discharging patients, often due to bureaucratic hurdles or waiting for test results, can cause backlogs in the ER.

Coordination with Other Departments:

Inefficient coordination with other hospital departments can slow down patient transfers and admissions.

Technological Integration: While EHR systems can improve efficiency, they often come with a learning curve and poorly integrated systems can slow down processes.

Socioeconomic Factors: Access to primary care combined with an aging population leads to higher ER volume for non-emergency conditions.



Consider This:

*“It is not possible to build a high-reliability system on unreliable components” – Dr. Marty Lucenti
Emergency Room Doctor and PhD
Industrial Engineer*

ED Capacity Management is a Complex Challenge

Matching Emergency Department (ED) capacity to demand is a complex and critical challenge faced by healthcare systems nationally. Additionally, the role of the ED within the community is evolving away from the traditional model to that of an advanced diagnostic center. Several factors contribute to this difficulty, including patient influx variability, staffing issues, resource limitations, and systemic inefficiencies. Perhaps the greatest predictor of an over-crowded ED is an over-crowded hospital, highlighted in the sidebar to the left. “Bed-boarded” patients seriously impact the most constraining variables that influence the ability to match capacity and demand: treatment space and staff.

Seeing The ED as a System

EDs function like lines (queues) where three main resources—doctors, nurses, and beds—need to be well-coordinated to make sure the available care consistently meets or exceeds the demand. Two major aspects of care must be managed: providing emergency treatment and caring for inpatients who are waiting in the ED for a hospital bed due to high hospital occupancy. Unlike predictable systems, EDs are unpredictable with varying patient arrivals and different medical issues.

When the workload exceeds the ED's capacity, service quality can quickly decline. In such systems, not providing timely care can be much more harmful than mistakes made while giving care. Therefore, it's crucial to ensure that patients are quickly directed to the right care setting, not just that their treatment is perfect.

The three images on the next page show what happens when EDs get backed up. Traditional EDs (left image) often see crowding in the waiting room, which is risky because patients are only assessed by triage. A safer and more satisfying approach is to begin evaluations and care as soon as possible. Some EDs now have providers in the triage/waiting area (middle image), but the best practice is to bring every patient directly into the care area for a doctor's evaluation and initial treatment (right image). After initial treatment, patients who don't need constant monitoring can be moved to a holding area, creating space for new patients to receive timely care. The latter model also shows the ED divided into three subunits: Emergency Care and Advanced Diagnostics, In-process Waiting, and Inpatient Holding, each properly staffed and equipped.

Dr. Marty Lucenti MD, PhD

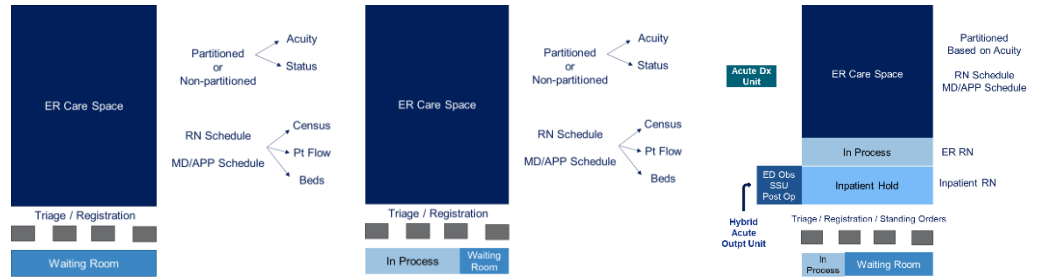
Dr. Lucenti is an Emergency Medicine physician with a PhD in Enterprise Systems Engineering. He is an expert in designing and implementing highly reliable strategies and systems of care delivery. He is also an expert in healthcare strategic sourcing. Dr Lucenti was the acting Chief Medical Officer for Vizient from 2018 until 2023. He brings a wealth of experience as an Emergency Medicine physician who practiced at Northwestern Memorial Hospital where he served first as the Medical Director and then as Vice-Chair of Clinical Operations. Before joining Vizient, Dr Lucenti ran MedAssets' Clinical Operations Consulting segment. He combines unique backgrounds in both medicine and operational engineering. Dr Lucenti holds a Bachelor of Science degree in Systems Engineering and Computer Science from the University of Virginia in Charlottesville, Virginia. He completed the Medical Scholars Program at the University of Illinois in Champaign, Illinois where he earned both a MD from the University's College of Medicine and a PhD in Industrial Engineering from the College of Engineering. He did his Emergency Medicine residency at Harvard Medical School, serving as Chief Resident. Dr Lucenti has served in the National Guard since finishing college. He has been deployed four times to Iraq – including two tours with the 10th Combat Support Hospital in the ER in Baghdad. He has also deployed to Afghanistan where he worked in the ER with the Combat Support Hospital in Bagram and as the Brigade Surgeon for the 86th Infantry Brigade Combat Team. Martin continues to serve in the Vermont Army National Guard where he has been both the State Surgeon and the Brigade Surgeon for the 86th Combat Brigade. Contact Marty at:

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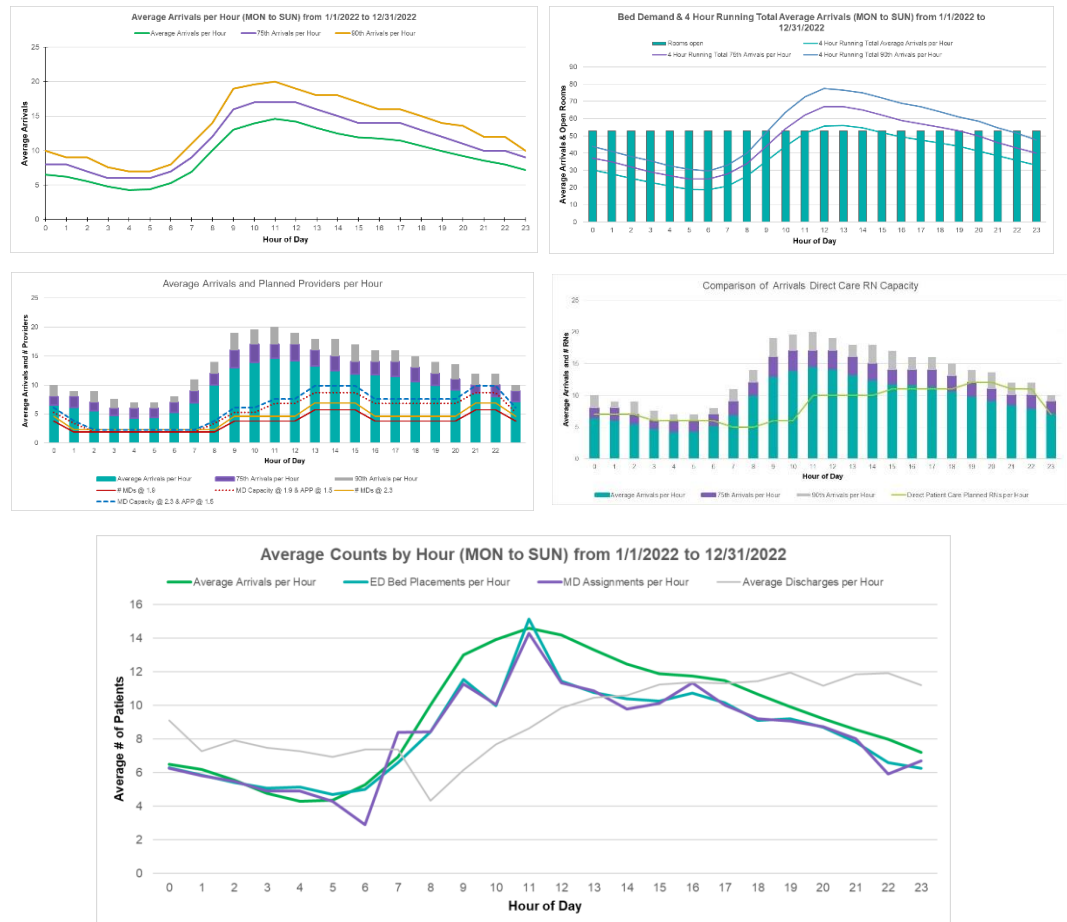
Marty is an experienced transformational leader and a pioneer in the healthcare arena. He has endless energy and passion for his craft! His blend of medical expertise and process engineering is a potent combination. His knowledge of healthcare operations is impressive. Perhaps most remarkable is Marty's ability to work with multidisciplinary teams to produce big results.

Marcus A. Garand
 Director, Operational Improvement
 Penn Medicine Princeton Health



Going Wait-Free

Using the third model above, the ideal process depends on the situation. When there are enough doctors, nurses, and beds to care for all patients, the system can be simple: gather enough information when patients arrive to direct them to the right care setting. If resources are limited, the process needs to be more detailed, focusing on prioritizing and reassessing patients who haven't yet received care. It's crucial to monitor how well the system is working to spot resource shortages. Here are some tools to identify these issues:





BRADLEY SCHULTZ & ASSOCIATES
At The Forefront

Bradley Schultz MBA, MBB

Bradley has more than 25 years of consulting and executive coaching experience, primarily, within the healthcare industry, but also in several others including Manufacturing, Insurance, eCommerce, and other Professional Services. Bradley joined Vizient through a series of acquisitions. In 2016, Vizient acquired MedAssets, where Bradley was Vice President of Lean Consulting. In 2012, MedAssets acquired Healthcare Performance Partners, where Bradley was a Consulting Director. In these roles, Bradley delivered more than 35 large-scale, transformational engagements and over \$560M in client value. Bradley is a recognized industry expert in Strategy Deployment, Process Engineering, Leadership Development and Organizational Change. Bradley holds a Bachelor's degree in Business Administration from Cardinal Stritch University, a post-graduate certificate in Quality Engineering from Milwaukee School of Engineering, and a Master of Business Administration from Marquette University. He is a Certified Six-Sigma Master Black Belt and Achieve Global Frontline Leadership Development Facilitator. In 2024 Bradley founded Bradley Schultz & Associates based on the principle that exceptional consulting goes beyond providing solutions – It's about understanding your unique needs, empowering your success, and delivering results that exceed expectations. Contact Bradley at: Bradley.Schultz1@outlook.com



"I had the honor to work with Brad at Garnet Health in New York on a process improvement event for ED throughput and for decreasing our length of stay metrics.

Brad has great insights on Program Development, Process Engineering, and Lean Six Sigma processes.

I highly recommend him and the work he delivers is exceptional."

Debora (Deb) Snyder MSN, RN, NEA-BC, CEN, DNP Candidate

Sustaining Results

The top-left graph on the previous page displays the arrival patterns of 80,000 patient visits per year to an Emergency Department (ED) based on the time of day. These visits are shown at the 50th, 75th, and 95th percentiles. Most EDs are designed for average, level-loaded volumes, leading to capacity shortages at least half the time. This issue is worsened by patients waiting for inpatient beds.

The top-right graph illustrates this problem. The bar chart represents the fixed ED capacity of 52 rooms, while the lines show the required number of treatment spaces at the 50th, 75th, and 95th percentiles.

The middle-left and middle-right graphs show MD and RN staffing by time of day, respectively. In both graphs, the staff levels (lines) are compared to patient volumes (bars) at the 50th, 75th, and 95th percentiles. These graphs demonstrate that staff increases lag volume increases, causing the ED to fall further behind.

The bottom graph shows that by 7:00 AM, patient arrivals exceed the ED's capacity to place and screen patients. Consider the impact of five additional patients arriving at an ED where each patient takes four hours to be processed, and the volume exceeds capacity for twelve hours per day, requiring an additional four hours to catch up. These five extra patients create twenty more hours of work for the ED team but add an additional eighty hours of wait time into the system due to exponential queue degradation. This has both negative and positive implications: the negative being exponential performance degradation, and the positive being that small increases in staffing ahead of the arrival curve and creating in-process wait locations can exponentially improve performance.

A major challenge in sustaining the results of this model is that soon after implementation, EDs experience increased volume, due to pent-up demand, and fewer patients leaving before being seen or treated. This increased volume necessitates additional staffing. Many organizations struggle to create flexible staff capacity and instead rely on a fixed capacity staffing model. However, those that successfully increase staffing to meet new, higher volumes often see an overall increase in productivity.