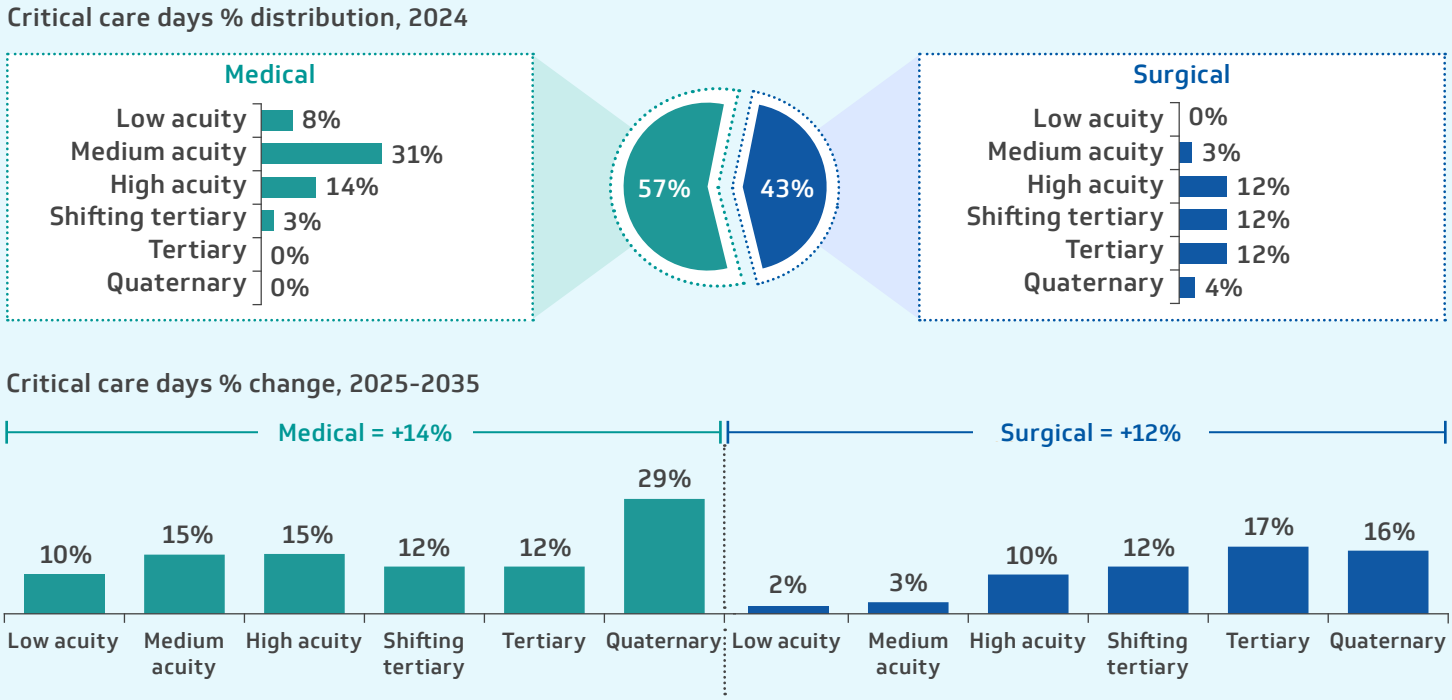
DATA ON THE EDGE

Critical care capacity: planning future resources

Our 2024 Data on the Edge report "Critical Care Capacity: Balancing Medical and Surgical" highlighted the widening gap between rising critical care demand and constrained intensive care unit (ICU) bed availability across all hospitals. As demand and acuity continue to increase, understanding critical care patient mix remains essential. Equally important is a deliberate assessment of ICU bed capacity to ensure hospitals are prepared to meet future needs with the right level of care, at the right place and at the right time.

Critical care patient days and acuity are on the rise

Figure 1. The need to balance medical and surgical demand persists



Note: Analysis excludes 0-17 age group. Percentages may not add to 100% due to rounding. Low acuity = DRG weight <1.0; medium acuity = DRG weight 1.0 to 2.0; high acuity = DRG weight >2.0. DRG = diagnosis-related group. Sources: Data from Vizient® Clinical Data Base used with permission from Vizient, Inc. All rights reserved. Accessed April 2025; Impact of Change®, 2025; HCUP National Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP) 2021. Agency for Healthcare Research and Quality, Rockville, MD; Claritas Pop-Facts®, 2025; Sg2 Analysis, 2025.

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ICU days are projected to increase by 14% between 2025 and 2035, compared to just 5% growth in overall inpatient utilization during the same period. As shown in Figure 1, medical ICU days continue to represent the majority of critical care demand, accounting for 57% of critical care use in 2025, driven primarily by medium- and high-acuity cases. Looking ahead, the demand for medical ICU days is projected to grow by 14% through 2035, outpacing the 12% increase forecasted for surgical cases. This widening imbalance will intensify pressure on ICU capacity constraints, particularly in hospitals already operating near their limits. Notably, surgical growth is concentrated in the most resource-intensive categories (i.e., tertiary and quaternary), which will increase the need for ICU resources.

These trends underscore the importance of a more proactive approach to ICU planning—one that integrates acuity-based forecasting, patient mix optimization and a broad hospital access strategy. Without a shift in how systems plan for and distribute ICU beds, the strain on critical care infrastructure will only worsen, particularly in areas where ICU bed closures or staffing shortages are already limiting access.

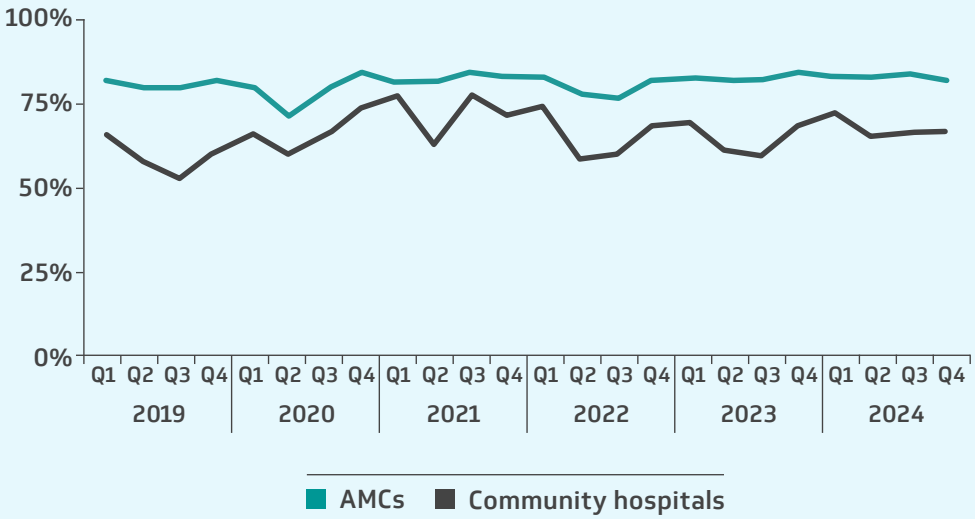
A closer look at ICU utilization

Figure 2. Increase in ICU average length of stay pushing occupancy rates to maximum capacity

AMC vs community hospital 2019-2024

	AMC hospitals		Community hospitals	
	2024 ALOS (days)	% Change 2019-2024	2024 ALOS (days)	% Change 2019-2024
Q1	4.1	9.4%	3.2	17.1%
Q2	3.7	3.1%	3.1	25.9%
Q3	4.0	7.9%	2.9	8.1%
Q4	3.8	4.1%	2.7	3.7%

ICU average equivalent occupancy rate 2019-2024



Note: AMC hospitals include Vizient comprehensive academic medical center (AMC) and large, specialized complex care medical center hospital cohorts; community hospitals include Vizient complex care medical center, community hospital and critical care hospital cohorts. Critical care average length of stay represents adult ICU only and does not include length of stay for the entire hospital. ALOS = average length of stay. Sources: Operational Data Base ALOS Occupancy and Financial Benchmarks, Q1 2019-Q4 2024. Vizient Operational Data Base. Irving, TX: Vizient, Inc.; 2025. https://www.vizientinc.com; Data from Vizient Operational Data Base used with permission of Vizient, Inc. All rights reserved.

The ALOS for critical care patients has risen significantly since 2019, with the sharpest increases observed in community hospitals (see Figure 2). This trend reflects growing patient complexity and persistent throughput challenges. At the same time, ICU occupancy rates have remained consistently high across both AMCs and community hospitals, leaving little flexibility to absorb future demand.

As recently highlighted in *JAMA Network Open*, national hospital occupancy has risen to an average of 75% and may surpass 85% by 2032. Access bottlenecks in other parts of the hospital create the risk of filling ICU beds with low- and medium-acuity patients. Active management of the ICU patient mix is more critical than ever to preserve high-acuity capacity and maintain quality of care. For hospitals already experiencing strain from recent growth, identifying solutions to improve ICU access and efficiency will be essential to meet rising critical care needs.

Building toward an ICU bed need assessment

A foundational approach to estimating ICU bed need begins with analyzing the hospital's total ICU days by DRG, then projecting future utilization based on demand trends. By combining these ICU day estimates with an appropriate target occupancy rate, organizations can produce a high-level forecast of ICU bed requirements over time.

To illustrate this methodology, Vizient integrated its Clinical Data Base with the Sg2 Impact of Change® forecast to generate a national ICU utilization calculation. Current ICU volumes and patient days were projected over the next decade. Table 1 highlights the 10 DRGs that account for the largest share of ICU days in 2025, along with their ALOS and projected growth rates through 2035.

Table 1. Top 10 critical care DRGs, 2025-2035

DRG	DRG description	IP portfolio	2025 ICU ALOS	2025 ICU days distribution	2025-2035 ICU days % change
871	Septicemia or severe sepsis without mv >96 hours with mcc	Medium acuity	3.6	8.8%	18.8%
870	Septicemia or severe sepsis with mv >96 hours or peripheral ECMO	High acuity	8.9	5.5%	14.7%
3	ECMO or tracheostomy with mv >96 hours or pdx except face, mouth and neck with major O.R. procedure	Tertiary	20.5	4.2%	9.6%
853	Infectious and parasitic diseases with O.R. procedure with mcc	High acuity	6.7	3.7%	12.1%
4	Tracheostomy with mv >96 hours or pdx except face, mouth and neck w/o major O.R. procedure	Shifting tertiary	18.1	3.3%	9.6%
207	Respiratory system diagnosis with ventilator support >96 hours	High acuity	9.4	3.0%	13.0%
208	Respiratory system diagnosis with ventilator support ≤96 hours	High acuity	4.0	2.8%	21.5%
291	Heart failure and shock with mcc	Medium acuity	3.7	2.2%	16.7%
23	Craniotomy with major device implant or acute complex CNS pdx with mcc or chemo implant or epilepsy with neurostimulator	Tertiary	5.1	1.6%	42.8%
64	Intracranial hemorrhage or cerebral infarction with mcc	Shifting tertiary	3.7	1.5%	7.9%
Overall		—	4.0	36.6%	13.6%

Surgical Medical

Note: Analysis excludes 0-17 age group. Low acuity = DRG weight <1.0; medium acuity = DRG weight 1.0 to 2.0; high acuity = DRG weight >2.0. Chemo = chemotherapy; CNS = central nervous system; ECMO = extracorporeal membrane oxygenation; mcc = major complication or comorbidity; mv = mechanical ventilation; O.R. = operating room; pdx = principal diagnosis; w/o = without. Sources: Data from Vizient® Clinical Data Base used with permission from Vizient, Inc. All rights reserved. Accessed April 2025; Impact of Change®, 2025; HCUP National Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP) 2021. Agency for Healthcare Research and Quality, Rockville, MD; Claritas Pop-Facts®, 2025; Sg2 Analysis, 2025.

These 10 DRGs account for 37% of total ICU days nationally; no single DRG has more than a 10% share. They represent a diverse mix of medical and surgical cases, spanning tertiary, high- and medium-acuity levels. Notably, most are projected to experience double-digit growth in ICU days over the next decade. Hospitals can customize and expand this analysis using their own data to support ICU bed forecasting and inform targeted critical care planning strategies. This approach also supports hospitals in leveraging internal data for more granular predictive analytics. Identifying patterns, such as seasonal surges (e.g., flu season) or weekday fluctuations driven by elective surgeries, allows hospitals to anticipate capacity constraints and proactively plan for staffing, bed availability and care pathways to improve critical care access.

Why it matters

- **Patient mix influences ICU sustainability.** Low- and medium-acuity medical cases comprise approximately 40% of total ICU days. As patient acuity is projected to increase over the next decade, hospitals must align not only the volume but also the type of ICU capacity with future demand. Ensuring ICU resources are reserved for patients who truly require high-acuity care is essential.
- **Longer stays and high occupancy are the new norm.** ICU length of stay has been rising, particularly in community hospitals. With occupancy rates persistently high, proactive ICU bed planning is essential to prevent capacity strain and preserve care access.
- **Analytics enable proactive ICU planning.** DRG-level projections of ICU days, combined with occupancy assumptions, enable organizations to rightsize ICU resources more accurately. By factoring in patient acuity, planning can address not only how much capacity is needed but also what level of care is required.
- **Intermediate care expands options without full ICU costs.** Hospitals should evaluate the role of intermediate or step-down units as these units can safely manage medium-acuity patients, reduce ICU overutilization and optimize patient placement across the continuum of care.
- **Workforce strategy is critical to ICU sustainability.** To address ongoing workforce challenges, hospitals should explore tech-enabled care models that leverage digital tools and AI-driven solutions to augment clinical workflows and expand critical care capacity.
- **Triage and command centers optimize critical care flow.** Proactive triage, both into and out of the ICU, is vital for maintaining bed availability. Centralized command centers, supported by AI-enabled analytics, can help predict which patients are likely to require intensive care and guide real-time decisions on admissions, transfers and discharges.

Sources: Leuchter RK et al. *JAMA Netw Open*. 2025;8(2):e2460645; Data from Vizient® Clinical Data Base used with permission from Vizient, Inc. All rights reserved. Accessed April 2025; Impact of Change®, 2025; HCUP National Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP) 2021. Agency for Healthcare Research and Quality, Rockville, MD; Claritas Pop-Facts®, 2025; Sg2 Analysis, 2025.

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To speak with one of our experts about critical care strategy, contact membercenter@sg2.com.

POWERED BY

VIZIENT DATA AND DIGITAL ANALYTICS

This report's analysis leverages the following proprietary data and analytics assets.

Sg2 Intelligence is a diverse team of subject matter experts and thought leaders who represent specialties ranging from clinical service lines to enterprise strategy. The team develops strategy-specific content in the form of editorial reports, including the Data on the Edge series, and perspective-based analytics, such as the Impact of Change® forecast.

The **Vizient Clinical Data Base** (CDB) is the definitive healthcare analytics platform for performance improvement. The CDB provides high-quality, accurate and transparent data on patient outcomes—such as mortality, length of stay, complication and readmission rates, and hospital-acquired conditions—that enable hospitals to benchmark against peers; identify, accelerate and sustain improvements; reduce variation; and expedite data collection to fulfill agency reporting requirements. Clinical benchmarking tools such as dashboards, simulation calculators, and templated and customizable reports enable you to quickly identify improvement opportunities and their potential impact.

The **Sg2 Impact of Change®** model forecasts demand for healthcare services over the next decade, examining the cumulative effects and interdependencies of key impact factors driving change in utilization. Using both disease-based and DRG-based analyses, the forecast provides a comprehensive picture of how patients will access inpatient and outpatient services along the continuum of care.

The **Sg2 CARE Grouper** is Sg2's proprietary methodology that organizes data across all sites into standardized, clinically relevant categories. It amalgamates ICD-10 diagnosis codes into clinically pertinent disease categories, which are then organized into broader service lines and service line groups. It also groups ICD-10 codes and CPT/HCPCS procedure codes into inpatient and outpatient procedure categories, respectively. These categories facilitate a standardized approach to tracking patient volumes and service utilization seamlessly across inpatient and outpatient settings. The Sg2 CARE Grouper is foundational for our analytics offerings and also serves as a stand-alone product that health systems rely on to manage their organizational data efficiently.

The **Sg2 Inpatient Portfolio** was created in collaboration, leveraging the analytical expertise of Vizient data scientists, vetted by clinical leaders and strategically honed by the Sg2 Intelligence team. The grouper translates MS-DRG discharges to six acuity-based subtypes:

- **Quaternary:** MS-DRGs mapped to Sg2's 2025 quaternary DRG list, which uses interacademic health system data to identify DRGs that consolidate in focused tertiary/quaternary centers. Examples include open heart valve procedures; head and neck cancer procedures; kidney, liver, heart and lung transplants; and CAR T-cell therapy.
- **Tertiary:** MS-DRGs mapped to Sg2's 2025 tertiary DRG list, which uses Vizient hospital cohort data to identify AMC-centered tertiary DRGs. Examples include brain/skull surgery, hepatectomy for liver cancer and traumatic injury.

- **Shifting tertiary:** MS-DRGs removed from Sg2 tertiary DRG list from 2017 to 2025, as these services have shifted, or are shifting, to community acute care providers from academic medical centers to enhance market capture. Examples include coronary artery bypass graft, endovascular procedures, lumbar/spinal fusion procedures and nephrectomy.
- **High acuity:** Discharges with a DRG weight of >2.0. Examples include leg amputation, mechanical ventilation, fracture repair, septicemia procedures and large bowel resection.
- **Medium acuity:** Discharges with a DRG weight of 2.0 to 1.0. Examples include primary hip/knee replacement, c-section, psychosis and congestive heart failure medical admission.
- **Low acuity:** Discharges with a DRG weight of <1.0. Examples include vaginal delivery, intestinal obstruction, diverticulitis, urinary tract infection and diabetes medical admission.

CAR = chimeric antigen receptor; CPT = Current Procedural Terminology; HCPCS = Healthcare Common Procedure Coding System; ICD = International Classification of Diseases; MS-DRG = Medicare severity diagnosis-related group.

The Vizient Data on the Edge series team includes Brianna Motley, Catherine Maji, Eric Lam and Sg2 Creative Services.

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