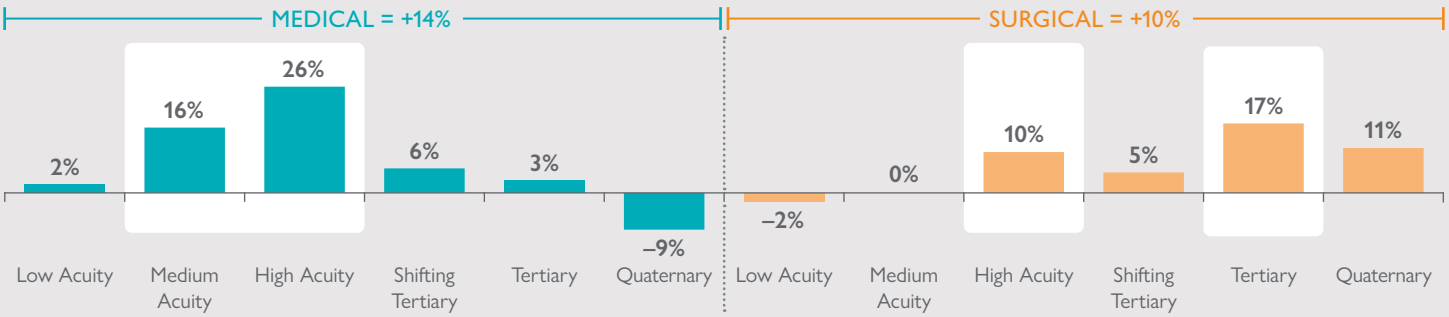
DATA ON THE EDGE

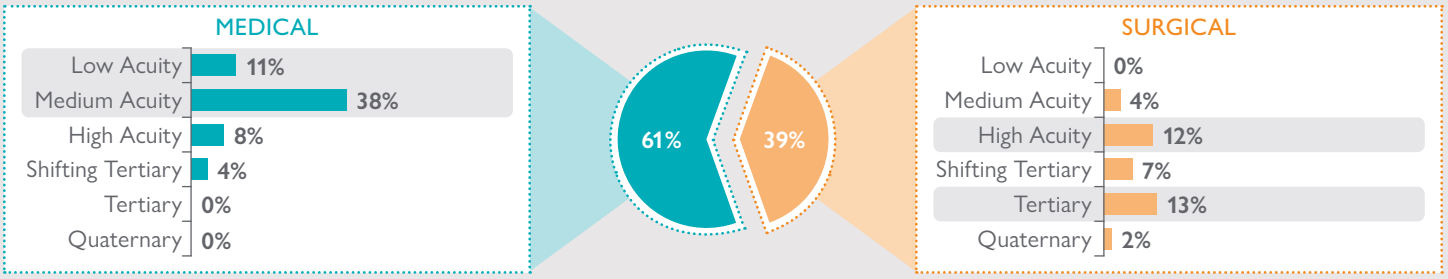
CRITICAL CARE CAPACITY: BALANCING MEDICAL AND SURGICAL

The increase in adult ICU utilization over recent years has been challenging ICU capacity, and critical care days are forecasted to continue to increase over the next ten years. Building more ICU beds to meet this increased demand, however, is not a solution for all hospitals because of the expense as well as the risk that the beds may quickly fill with patients who do not need the highest level of care. Effective management of rising ICU demand will be essential. The first step in planning for future demand is to assess your critical care patient mix.

Critical Care Days % Change, 2023–2033



Critical Care Days % Distribution, 2023



Note: Analysis excludes 0–17 age group. Percentages may not add to 100% due to rounding. 0% indicates the forecast is flat (less than ±1%). Low acuity = DRG weight <1.0; medium acuity = DRG weight 1.0 to 2.0; high acuity = DRG weight >2.0. **Sources:** Vizient® Clinical Data Base/Resource Manager™. Irving, TX: Vizient, Inc.; 2024. https://www.vizientinc.com; Impact of Change®, 2023; HCUP National Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP) 2019. Agency for Healthcare Research and Quality, Rockville, MD; Claritas Pop-Facts®, 2023; Sg2 Analysis, 2023.

Critical care patient days are on the rise for large community hospitals, with a projected 13% increase for both medical and surgical adult cases between 2023 and 2033, according to Sg2's Impact of Change® forecast. As shown above, growth in days for medical critical care patients will outpace overall growth in surgical critical care patient days, which are forecasted at 14% and 10%, respectively, over the decade. Additionally, medical critical care days represent just over 60% of all patient days in the ICU—which is in part a result of the ongoing system-wide procedure shift to lower-acuity settings. The high proportion of medical critical care patient days presents the risk of eroding margin from critical care services for the organization. Mitigating the capacity issues and effective management of ICU beds is a vital element of organizational financial sustainability.

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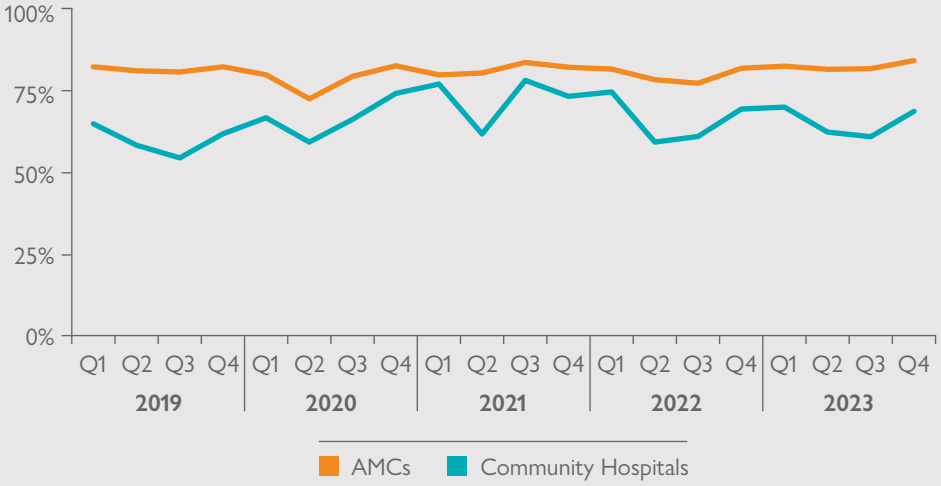
Increase in ICU Average Length of Stay Pushing Occupancy Rates to Maximum Capacity

AMC vs Community Hospital
2019–2023 ALOS by Quarter

	AMC Hospitals		Community Hospitals	
	2023 ALOS (DAYS)	% Change 2019–2023	2023 ALOS (DAYS)	% Change 2019–2023
Q1	4.0	8.8%	3.4	22.8%
Q2	4.0	13.3%	3.1	24.7%
Q3	4.2	14.6%	3.0	13.9%
Q4	4.1	11.5%	3.2	15.8%

ICU Average Equivalent Occupancy Rate
2019–2023



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. **Sources:** Operational Data Base ALOS Occupancy and Financial Benchmarks, Q1 2019–Q4 2023. Vizient Operational Data Base™ (ODB). Irving, TX: Vizient, Inc.; 2024. https://www.vizientinc.com; Data from Vizient Operational Data Base used with permission of Vizient, Inc. All rights reserved.

Leveraging the Vizient Clinical Data Base (CDB) and Sg2 CARE Grouper, Sg2 can classify critical care days by patient acuity levels. **Nearly 50% of all adult critical care days at large community hospitals are for medical patients in the low and medium acuity categories.** The drivers of this trend are multifaceted, including rising patient complexity and access-related issues such as limited capacity and closures of ICU beds in other locations.

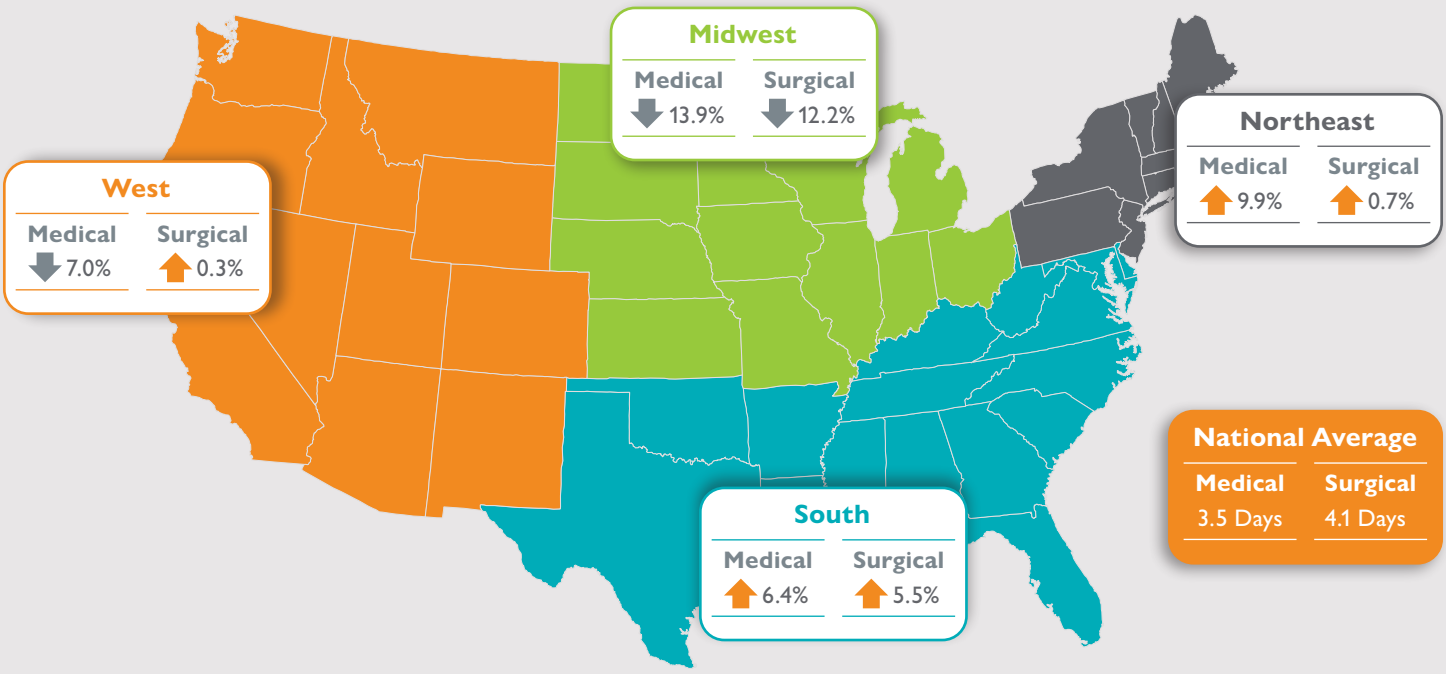
Looking ahead, **medical critical care days for patients with medium and high acuity are expected to increase** 16% and 26%, respectively, over the next decade. Conversely, growth for **surgical critical care days is projected to be the most accelerated for high acuity, tertiary and quaternary level cases:** 10%, 17% and 11%, respectively, for large community hospitals.

When comparing critical care utilization for large community hospitals and academic medical centers, the average length of stay for AMCs is longer for both medical and surgical critical care cases due to higher acuity levels, especially for tertiary and quaternary services. The growth trajectory for AMCs is similar to that for large community hospitals, but it is noteworthy that double-digit growth is projected for quaternary cases for AMCs: 12% for medical and 20% for surgical cases.

Recent data from the Vizient® Operational Data Base highlight national trends in adult ICU utilization, revealing that the average length of stay has continued to exceed pre-pandemic levels at both AMC and community hospital ICUs. From 2019 to 2023, ICUs at community hospitals experienced a significant annual rise in ALOS, surging by 25%, compared to a 12% increase at academic medical centers. This increase in average length of stay suggests that the COVID-19 pandemic had a lasting impact on patient care complexity and resource utilization and that community hospitals face more pronounced challenges than academic medical centers in managing ICU throughput. While occupancy rates at AMCs have remained relatively stable, with a modest 1.5% growth from 2019 to 2023, community hospitals saw a more pronounced 9% uptick, suggesting that AMCs, with consistently high occupancy rates prior to the pandemic, may have reached maximum capacity. Furthermore, the data point out notable seasonal variation in occupancy rates at community hospitals that is not present at AMCs, underscoring the differences in critical care case mix between these hospital types.

Interestingly, **critical care ALOS varies by US region;** therefore, it is important to evaluate the regional and local trends when planning. The South trends about 6% higher than the national average critical care ALOS for both medical and surgical critical care cases, while the Northeast trends about 10% higher than the national average but only for medical cases. This can be attributed to care delivery variations, patient demographics, patient mix and availability of ICU beds.

Critical Care ALOS: Regional Variation From National Average



Note: Critical care average length of stay indicates the ICU portion of the hospital stay only and does not include the entire hospital length of stay.
Sources: Vizient Clinical Data Base/Resource Manager™. Irving, TX: Vizient, Inc.; 2024. https://www.vizientinc.com; Sg2 CARE Grouper, 2023.

Taking a step back, the important question to ask is: are there enough ICU beds to meet the increasing demand? According to the American Hospital Association, **the number of ICU beds in the US has been trending downward** since the spike from the pandemic in early 2020. ICU bed closings, resulting from causes such as low census in rural hospitals and service realignment, have been in the recent news. The increasing demand for critical care services and rising resource gaps accentuate the need for providers to evaluate broader System of CARE (Clinical Alignment and Resource Effectiveness) strategies to effectively meet rising demand.

Why It Matters

As a result of Vizient's analysis of critical care trends and future demand, several takeaways and considerations emerge:

Quality

- Regional variation in average length of stay trends exist.
- Understand local factors and assess intrasystem variation to identify drivers of variation as well as quality improvement opportunities.
- Align ICU care team decisions with system and/or national benchmarks to reduce variation.
- Consider leveraging predictive analytics capabilities to anticipate potential deterioration and need for transfers.
- Support quality-of-life decisions by discussing advanced directives with patients and families in the ambulatory setting, offering palliative care, and providing spiritual counseling.

Workforce

- Intensivist-directed care models have demonstrated efficacy and efficiency in the delivery of quality critical care. However, the national shortage of intensivists, which is projected to continue, is an aspect of health care workforce challenges that needs to be solved.
- Rightsize medical ICU bed numbers, which can help manage ratios amid ongoing staffing challenges.
- Consider opportunities for eICU to improve patient safety and quality, extend the number of beds available, and scale the cost of intensivists.

Access and Capacity

- With the closure of community hospital ICU beds, access will become more constrained, increasing pressure on large community hospital and tertiary-quaternary hospital ICUs, specifically for medical cases.
- Assess local trends, risk of bed closures for nearby facilities and internal quality metrics to determine opportunities. Proactively evaluate options for a distributed strategy and pinpoint operational efficiency opportunities.
- Prepare for future growth in medium and high acuity medical ICU days and tertiary and quaternary surgical ICU days, especially in intermediate care or step-down units. Ensure the right type of capacity will be available to meet future demand.
- Consider opportunities to develop partnerships and leverage innovative and digital solutions to improve the ICU admitting process. For example, Tampa General Hospital is using artificial intelligence to manage patient flow and streamline patient transport.

Sources: Gooch K. New Mexico hospital to shutter ICU. *Becker's Hospital Review.* April 26, 2023; Ballad Health. Ballad Health investing in outpatient services, realigning intensive care services at Sycamore Shoals Hospital [press release]. May 15, 2023; Tampa General Hospital. Innovative AI platform increases efficiency at Tampa General Hospital [press release]. August 1, 2022; Siwicki B. Tampa General gains clinical and operational rewards with its command center. *Healthcare IT News.* September 16, 2022; Health Resources and Services Administration. Telehealth center of excellence–Medical University of South Carolina. Accessed March 2024; Vizient Clinical Data Base/Resource Manager™. Irving, TX: Vizient, Inc.; 2024. https://www.vizientinc.com; Operational Data Base ALOS Occupancy and Financial Benchmarks, Q1 2019–Q4 2023. Vizient Operational Data Base™ (ODB). Irving, TX: Vizient, Inc.; 2024. https://www.vizientinc.com; Data from Vizient Operational Data Base used with permission of Vizient, Inc. All rights reserved. Impact of Change®, 2023; HCUP National Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP) 2019. Agency for Healthcare Research and Quality, Rockville, MD; Claritas Pop-Facts®, 2023; Sg2 Analysis, 2023.

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

POWERED BY

VIZIENT DATA AND DIGITAL ANALYTICS

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

Sg2's Impact of Change model forecasts demand for health care 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 **Vizient Clinical Data Base** is the definitive health care 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 Adult Critical Care Scenario Modeling Tool** helps strategy leaders evaluate the impact of critical care utilization by modeling forecasted inpatient discharges and associated patient days and incorporating programmatic strategic growth at the service line level of detail. The tool leverages Vizient's data assets, including the Vizient Clinical Data Base national benchmarks for critical care volume, the Sg2 Impact of Change forecast and the Sg2 CARE Grouper.

The **Sg2 IP Portfolio Subtype** grouper translates MS-DRG discharges to six acuity-based portfolio subtypes:

- **Quaternary:** MS-DRGs mapped to Sg2's 2022 quaternary DRG list. Examples include transcatheter 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 2022 tertiary DRG list, which is composed of 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 2022, as these services have shifted, or are shifting, to community acute care providers. 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.

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The **Vizient Operational Data Base** provides hospitals with transparent, comparative insights on the operational characteristics of hospital departments to support performance improvement, budgeting and cost reduction initiatives. It includes reliable financial and operational data that help organizations make informed decisions about employee productivity, supply usage and other areas that directly impact the bottom line.

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.

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.

HCPCS = Healthcare Common Procedure Coding System.

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