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Level of Care Appropriateness in VA Inpatient Surgery Cases

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ABSTRACT

Purpose of Study: Within the Veterans Health Administration, utilization management (UM) focuses on reducing unnecessary or inappropriate hospitalizations by applying evidence-based criteria to evaluate whether the patient is placed in the right level of care. This study examined inpatient surgery cases to classify reasons for not meeting criteria and to identify the appropriate level of care for admissions and subsequent bed days of care.

Primary Practice Settings: There were 129 VA Medical Centers in which inpatient UM reviews were performed during that time, of which 109 facilities had UM reviews conducted in Surgery Service.

Methodology and Sample: All admissions to surgery service during fiscal year 2019 (October 1, 2018 to September 30, 2019) that had a UM review entered in the national database were extracted, including current level of care, recommended level of care, and reasons for not meeting criteria. The following demographic and diagnostic fields were supplemented from a national data warehouse: age, gender, marital status, race, ethnicity, and service connection status. Data were analyzed with descriptive statistics. Characteristics of patient demographics were compared using the χ^2 test for categorical variables and the Student's *t* test.

Results: A total of 363,963 reviews met conditions to be included in the study: 87,755 surgical admission reviews and 276,208 continued stay reviews. There were 71,274 admission reviews (81.22%) and 198,521 (71.87%) continued stay reviews that met the InterQual criteria. The primary reason for not meeting admission criteria was clinical variance (27.70%), followed by inappropriate level of care (26.85%). The leading reason for not meeting continued stay criteria was inappropriate level of care (27.81%), followed by clinical instability (25.67%). Of the admission reviews not meeting admission criteria, 64.89% were in the wrong level of care and 64.05% of continued stay reviews were also in the wrong level of care. Half of the admission reviews not meeting criteria had a recommended level of care as home/outpatient (43.51%), whereas nearly one-third (28.81%) continued stay reviews showed a recommended level of care of custodial care or skilled nursing.

Implications for Case Management Practice: This study identified system inefficiencies through admission and continued stay reviews of surgical inpatients. Patients admitted for ambulatory surgery or for preoperative testing prior to day of surgery resulted in avoidable bed days of care that may have contributed to patient flow issues and limited the available hospital beds for other patients. Through early collaboration with case management and care coordination professionals, alternatives can be explored that safely address the patient needs, such as temporary lodging options. There may be conditions or complications that can be anticipated on the basis of patient history. Proactive efforts to address these conditions may help avoid unnecessary bed days and extended lengths of stay.

Key words: *acute care, InterQual, quality management, utilization management, utilization review*

Health care spending continues to rise in the United States each year with an expected average annual rate of increase of 5.4% between 2019 and 2028, and spending is estimated to account for 19.7% of the gross domestic product by 2028 (Keehan et al., 2020). There are many categories of waste in health care, including overtreatment and failures of care coordination that contribute to more than 20% of health care expenditures (Berwick & Hakbarth, 2012). Different cost containment strategies have been implemented to contain rising health care costs. Utilization management (UM) programs have been built to reduce consumption of unnecessary or inappropriate health care services (Wickizer & Lessler, 2002). Utilization management helps manage or coordinate resources in a quality-focused and cost-effective manner. Ensuring the patient receives the right level of care (LOC) can help avoid unnecessary

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bed days, thus reducing potential for patient harm (Caminiti et al., 2013).

Private sector payment strategies are different than those within the Veterans Administration (VA) inpatient payment structure. As a federal agency, VA hospitals receive little payment from insurance collections (≤3% of total budget). Because of the difference in economic incentives, the VA may be more likely to have inappropriate admissions when compared with the private sector (Render et al., 2003).

Within the Veterans Health Administration (VHA), the Office of Utilization Management was created with a mission to ensure that US Veterans receive the right care, at the right time, in the right place, for the right reason. The VHA has been using the proprietary-based licensed software program InterQual (IQ; https://www.changehealthcare.com/clinical-decision-support/interqual) to apply decision support evidence-based criteria to conduct inpatient UM reviews since 1993. The evidence-based clinical support process assists health care providers to assess whether medical services are medically necessary and appropriate. Decision support tools for determining appropriate levels of care have been found to be effective in cost-savings, health outcomes, and for promoting patient safety (Dawson & Runk, 2000).

The purpose of this study was to examine the proportion of surgical admissions and subsequent bed days of care that did not meet IQ criteria, evaluate the reasons for not meeting the criteria, and identify instances in which a different LOC was more appropriate.

Primary Practice Settings

There were 129 VA Medical Centers (VAMCs) across the United States in which inpatient UM reviews were performed during the time of this study, of which 109 facilities (84.50%) had UM reviews conducted in surgery service.

Methodology and Sample

Institutional review board (IRB) approval from the affiliated institution was obtained. Only cases in surgery service were included in this study because the criteria for surgery patients differ from those patients in medicine or behavioral health service. All admissions to surgery service during fiscal year 2019 (October 1, 2018, to September 30, 2019), which had a UM review entered in a VHA-developed web-based software solution called National Utilization Management Integration (NUMI), were pulled from the database using structured query language. More than 600 UM nurse reviewers conduct daily inpatient reviews on observation stays, acute admissions, and continued stay days within the VHA. More than 2.5 million reviews are collected annually in NUMI, which automates utilization review assessment and outcomes. The IQ criteria are used in the review process to determine whether the patient meets criteria for acute hospital care and assesses the most appropriate LOC within the hospital setting. In the VHA, UM reviewers focus on appropriate LOC and patient care transitions. Nurse reviewers complete the review based on IQ criteria indicated for the LOC within the subset that is applied. Level of care options, based on intensity of service levels, are provided through the criteria. Level of care is assessed at the same time as criteria because the LOC is different within each criterion set. When the review meets IQ criteria for the LOC that the patient is placed, the patient is at the correct LOC and no recommended LOC (RLOC) change is assigned. If IQ criteria are not met, the reviewer is prompted in NUMI to select both a RLOC and a reason (variance) code for not meeting the criteria. For example, if the patient could be safely cared for in the surgical unit versus the step-down or intermediate care unit, an inappropriate LOC reason code is selected. In some instances, the RLOC selected could be the same as the current LOC (CLOC). This could be for a patient who does not meet the IQ criteria but is in the appropriate LOC. A patient may be in the hospital awaiting placement and no longer meets criteria for acute care but must remain until a safe and appropriate placement is completed. Inpatient levels of care are reviewed and include observation, acute, critical, and intermediate (step-down) units. A description of these levels of care is provided in Appendix A.

All reviews conducted through the UM review process are entered into the NUMI software and are automatically recorded into a database that can be queried for reporting. Admissions to an observation LOC or conversion from observation to inpatient admission were excluded, as well as any admission reviews conducted on an admission stay of less than 12 hr. Data for the CLOC, RLOC, variance codes, and comments field were pulled from the NUMI database. During the same study period, all continued stay reviews were pulled using the same method. Continued stay reviews done on the day of discharge were excluded. Inappropriate LOC was defined as instances in which the CLOC documented did not match the RLOC. Reason codes were evaluated to determine why the review did not meet the IQ criteria. Patient demographic and diagnostic fields were extracted from the VA's Corporate Data Warehouse (CDW). Patient demographics included age, gender, marital status, race, ethnicity, and service connection status. Service connection disability in the VHA is assessed by determining whether the Veteran has a medical condition associated with their military service and ranges from 0% to 100% service connected. Length of stay (LOS) was calculated using unique

For the 16,481 reviews that did not meet criteria, 26.85% did not meet criteria due to placement at an inappropriate LOC. There were bed capacity issues where the inpatient LOC was not available (e.g., no step-down unit) or no bed was available in the facility ….

hospitalization identifiers for the continued stay reviews by subtracting the discharge date time stamp from the admission date time stamp. Data were analyzed with descriptive statistics. Characteristics of patient demographics were compared by using the χ^2 test for categorical variables and the Student's *t* test for normally distributed continuous variables. Statistical significance was defined as a *p* value of ≤.0001. All analyses were conducted using SAS Enterprise Guide 8.2 (SAS Institute, Cary, NC). All acronyms used in the article can be found in Appendix B.

Results

In fiscal year 2019, 97.45% of the surgical admissions and 88.40% of the surgical continued stay days were reviewed by UM nurse reviewers. There were 87,755 surgical admission reviews and 276,208 continued stay reviews for a total of 363,963 reviews that met the inclusion criteria. It was found that 71,274 (81.22%) of surgical admission reviews met IQ admission criteria and 198,521 (71.87%) met IQ continued stay criteria. For the cases not meeting IQ criteria, further review examined whether the patient was placed in the RLOC. Only 35.11% of cases not meeting IQ admission criteria were placed in the RLOC whereas 35.95% of cases not meeting IQ continued stay criteria were in the RLOC (see the study flowchart in Figure 1).

Patient demographics were assessed from the admission reviews to examine differences between patients meeting IQ criteria and those not meeting IQ criteria upon admission. Patients meeting IQ criteria were more likely to be married, White, not Hispanic or Latino, and having service-connected benefits related to a surgical issue (see Table 1).

Admissions

Reasons or variance codes were analyzed to determine the reasons cases did not meet IQ admission criteria, which included admission to the appropriate LOC. For the 16,481 reviews that did not meet criteria, 26.85% did not meet criteria due to placement at an

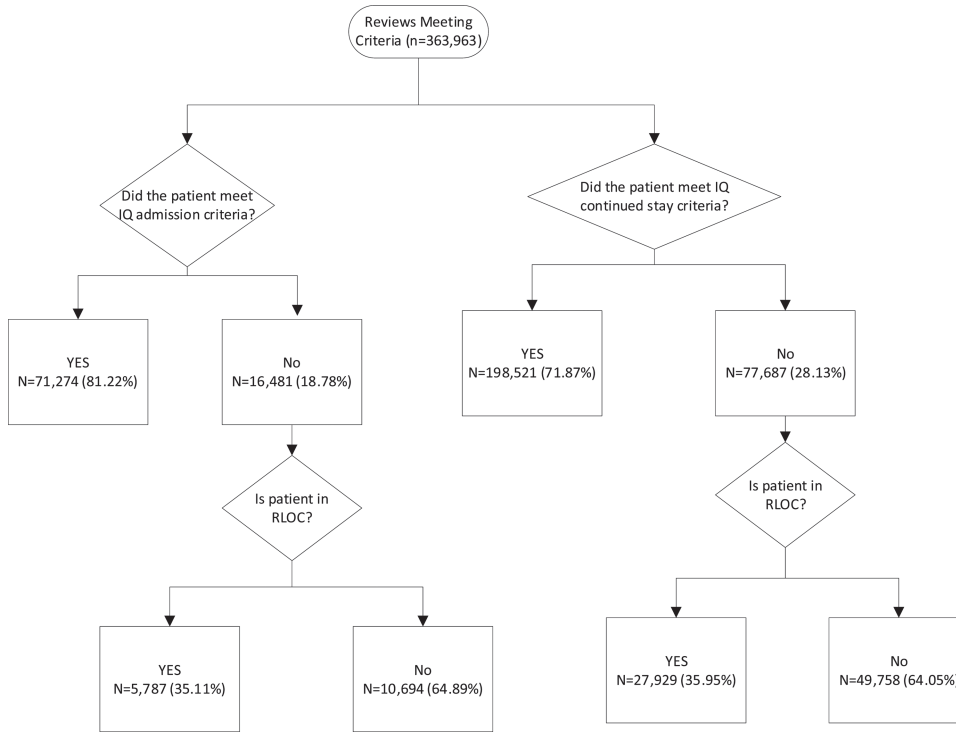

FIGURE 1
Study flowchart. IQ = InterQual; RLOC = recommended level of care.

TABLE 1
Patient Demographics Meeting InterQual Criteria Versus Not Meeting InterQual Criteria (n = 87,755)

Demographic Variable	Meeting Criteria (n = 71,274)	Not Meeting Criteria (n = 16,481)	p
Age, in years, mean (*SD*)	65.20 (11.28)	65.45 (12.43)	.01
Gender, *n* (%)			.0001
Male	65,678 (92.15)	15,334 (93.04)	
Female	5,596 (7.85)	1,147 (6.96)	
Marital status, *n* (%)			⩽.0001
Married	35,819 (50.26)	7,338 (44.52)	
Not married	35,455 (49.74)	9,143 (55.48)	
Race, *n* (%)			
White	52,758 (74.02)	11,822 (71.73)	
Black or African American	13,751 (19.29)	3,398 (20.62)	
American Indian or Alaska Native	662 (0.93)	149 (0.90)	
Native Hawaiian or Other Pacific Islander	453 (0.64)	135 (0.82)	
Asian	375 (0.53)	108 (0.66)	
Unknown	3,275 (4.59)	869 (5.27)	⩽.0001
Ethnicity, *n* (%)			
Not Hispanic or Latino	64,891 (91.04)	14,831 (89.99)	⩽.0001
Hispanic or Latino	4,466 (6.27)	1,132 (6.87)	
Unknown	1,917 (2.69)	518 (3.14)	
Eligibility, *n* (%)			⩽.0001
Service-connected	43,991 (61.72)	9,613 (58.33)	
Nonservice connected	27,283 (38.28)	6,868 (41.67)	

inappropriate LOC. There were bed capacity issues where the inpatient LOC was not available (e.g., no step-down unit) or no bed was available in the facility for the RLOC, but this represented a small percentage of cases. The most common reason for not meeting admission criteria was due to clinical variance, meaning the patient did not meet the criteria for the initial diagnosis but had other medical conditions necessitating an inpatient stay. It is not known whether some of these variances could have been foreseen and prevented or remedied prior to surgery. Finally, more than one-quarter (27.61% total) were admitted for care that could have been delivered in an outpatient setting, including workup, preoperative tests, and ambulatory surgery procedures, for example (see Figure 2).

The largest segment of RLOC for patients not meeting the IQ criteria was outpatient/home. There were also a quarter of cases that had an RLOC of observation. Of the 16,481 patients not meeting criteria for admission, 10,694 (64.89%) had a different RLOC from the CLOC (see Figure 3).

Figure 4 shows the discrepancy for admissions between the CLOC and the RLOC. This was determined when the CLOC did not match the RLOC. First, if the patient was admitted to the acute LOC, 2,277 (30.65%) should have been placed in observation LOC and 4,412 (59.39%) should have had care delivered in the outpatient/home settings. Second, if the patient was admitted to a critical care unit, 1,003 (63.97%) should have been placed in acute care instead and 312 (19.90%) into an intermediate or step-down LOC. Third, if the patient was placed in step-down, 1,237 (72.89%) should have been placed in acute care instead. For all current levels of care (acute, critical, and step-down) described in Figure 4, only 1.76% of admissions (188/10,694) should have been placed in a higher LOC (see Figure 4).

Continued Stays

The primary reasons for not meeting continued stay criteria were as follows: 19,881 clinical instability (25.67%), 21,539 inappropriate LOC (27.81%), comorbid conditions 5,214 (6.73%), 4,462 (5.76%) no bed availability RLOC, and 4,321 (5.58%) awaiting community placement (see Figure 5).

For continued stays not meeting criteria, nearly one-third of reviews reflected transition issues in transferring the patient out of the inpatient setting to a nursing home (either custodial care or skilled nursing facility).

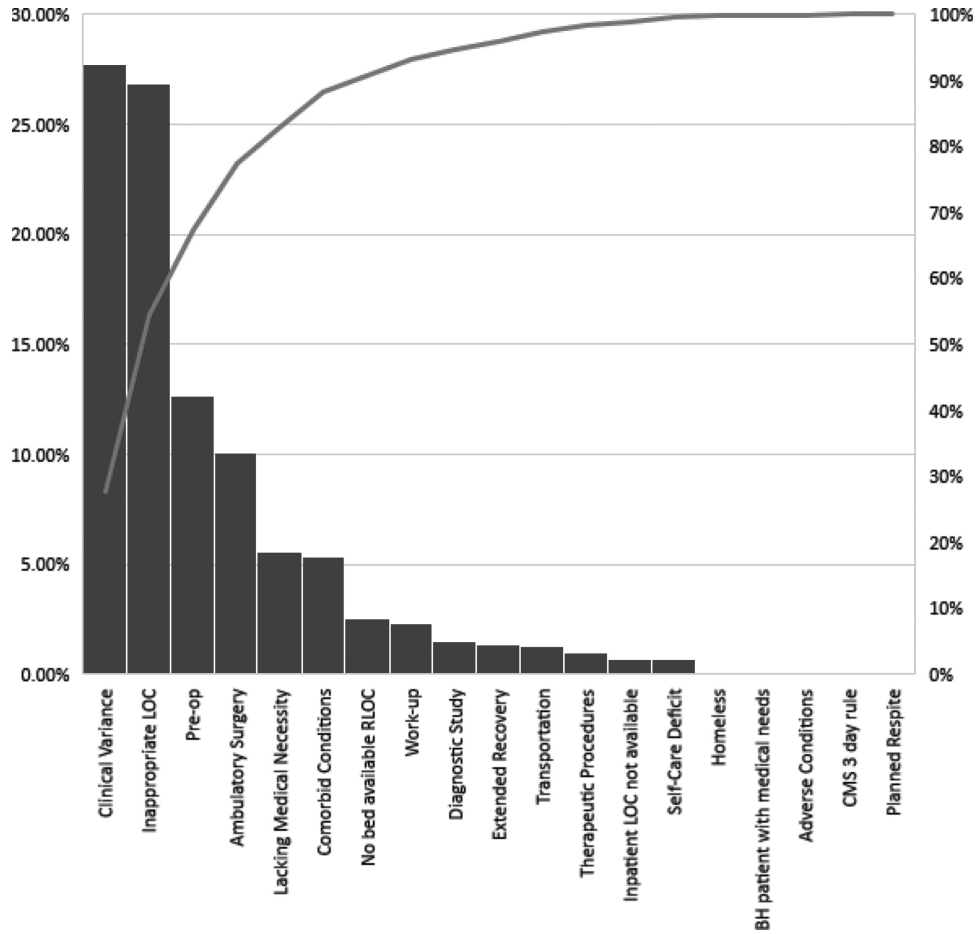

FIGURE 2
Reasons not meeting admission criteria (n = 16,481).

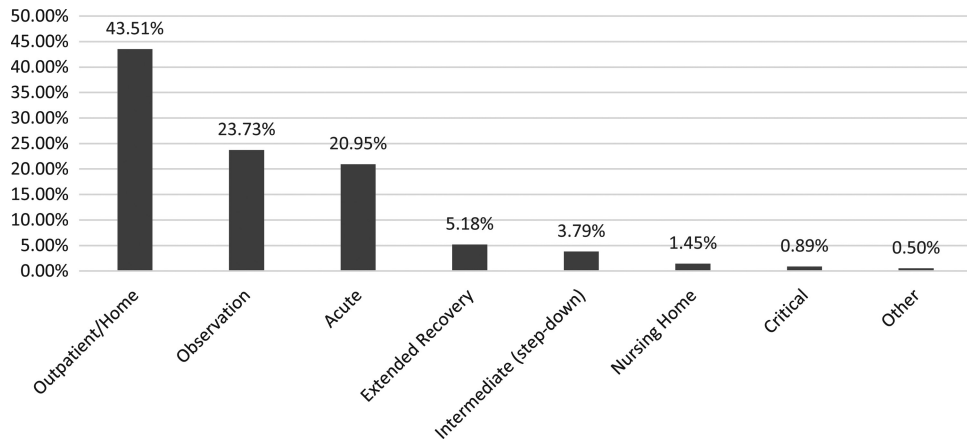

FIGURE 3
Recommended level of care for patients not meeting admission criteria.

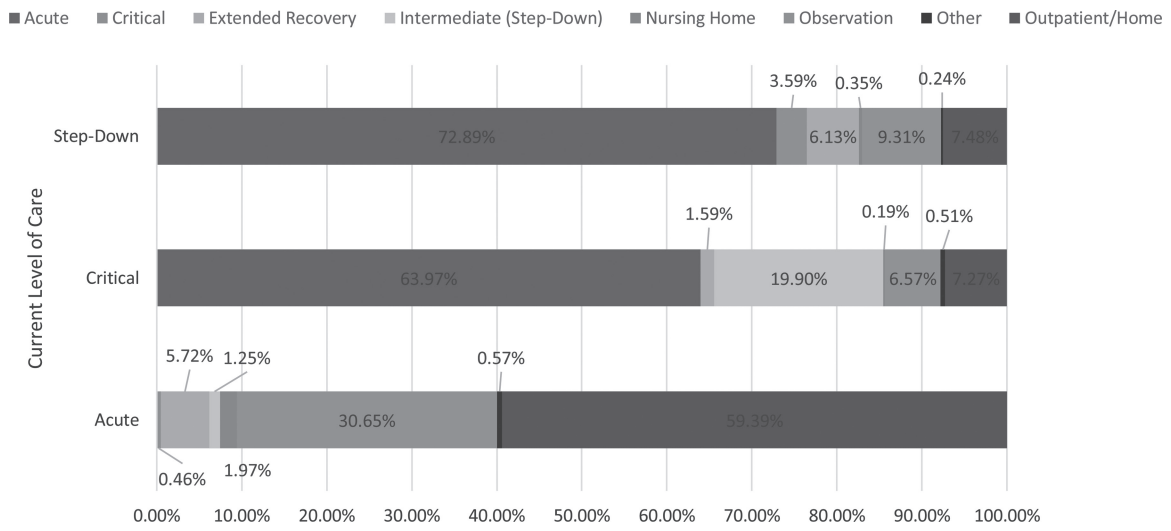

FIGURE 4
Current level of care versus recommended level of care for admissions not meeting criteria.

For continued stays not meeting criteria, nearly one-third of reviews reflected transition issues in transferring the patient out of the inpatient setting to a nursing home (either custodial care or skilled nursing facility). System issues were evident with 16% of patients needing transition to the outpatient care setting or home (see Figure 6).

Figure 7 highlights the mismatch between the CLOC placement and the RLOC placement for patients not meeting the continued stay criteria. Transition problems appeared with 13,474 bed days of care (55.99%) that should have been in a nursing home (custodial or skilled nursing) rather than acute care, and 7,619 (31.66%) should have been discharged to home or outpatient care. For those in critical care, 10,722 bed days of care (74.00%) should have been in the acute rather than critical LOC and 3,190 (22.02%) should have been in intermediate step-down versus critical care. In the step-down LOC 9,845 (87.89%) should have been placed in acute care. For all current levels of care (acute, critical, and step-down) described in Figure 7, only 1.20% of bed days of care (595/49,758) should have been placed in a higher LOC (see Figure 7).

The LOS was calculated for each individual hospitalization and compared with the IQ criteria outcomes. Those who met the IQ criteria had lower lengths of stay versus those not meeting criteria. For patients who had at least one continued bed day of care (BDOC) not meeting criteria, the unadjusted LOS was double that of those who met criteria for the entire hospitalization (10.43 days vs. 5.11 days; see Table 2).

Implications for Case Management Practice

The study objectives were to understand why surgical patients were admitted to the hospital who did not meet criteria for admission and why they continued to stay at their CLOC. Although less than 2% of admissions and continued stays were placed in a lower LOC than recommended, quality and safety concerns are present. For example, if the patient was admitted to the surgical unit but should have been admitted to a critical care unit, the patient may not have received the higher LOC, monitoring, or services needed. There are times when the appropriate LOC is known and documented, but there is no bed available at the higher LOC. Conversely, receiving care at a higher level than medically necessary suggests system inefficiencies that can negatively impact bed availability for patients who need a higher or more intensive LOC.

In the VA, there are some facilities that provide dual roles of UM reviewers and case managers. In the dual role, the task of system inefficiency identification is accomplished through the UM review, but the information is utilized by the same staff member to perform discharge planning. For the most part, however, the UM reviewer role and case manager role are separate in the VA.

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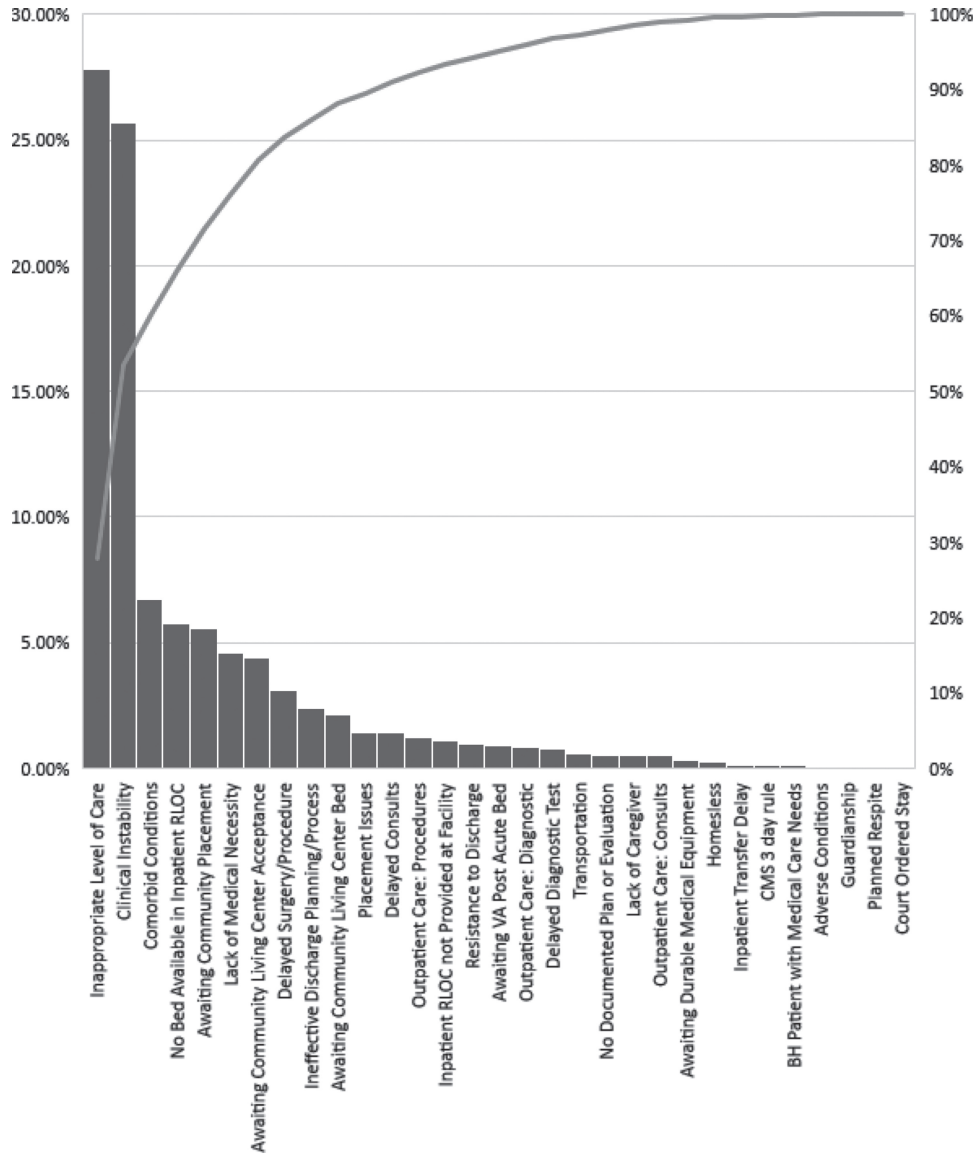

FIGURE 5
Reasons not meeting continued stay criteria (n = 77,687).

Despite differences in payment and reimbursement structures, hospitals around the globe face similar issues in safely transitioning patients from the inpatient to the outpatient setting. In Canada, which also has a government-funded health care system, Bruce et al. (2002) observed that 40% of non–acute days spent in the hospital were by short stay patients awaiting home care services to be arranged. This issue was addressed by reviewing existing practices related to arranging home care services to facilitate discharge of non–acute patients who can be cared for in their home. The same study also observed short stay hospitalized patients waiting for diagnostic testing prior to discharge because the waiting period was shorter for patients in the hospital versus using outpatient services. In both environments, there is little incentive to discharge the patient. In another Canadian study, a hospital was able to reduce and maintain

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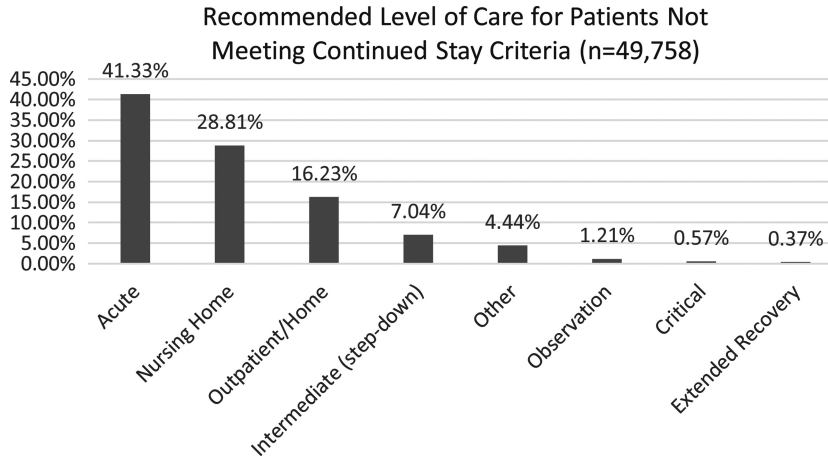

FIGURE 6
Recommended level of care for patients not meeting continued stay criteria.

low numbers of inappropriate levels of care by maintaining a productive relationship with community case managers, patients, and families who all helped ensure a safe transition from hospital to community settings, thus avoiding unnecessary bed days of care (Ricottone, 2015). De-incentivizing diagnostic testing done on the inpatient side and facilitating home and community care services are interventions that could work within the VA structure.

In a nongovernment small rural U.S. health system, inappropriate hospital admissions were found to be reduced by placing experienced case managers in the emergency department because the case managers helped place patients in community care settings, ordered durable medical equipment, and set up home health care services, thus avoiding unnecessary admissions (Hospital Access Management. Relias Media, 2003). The VA has already started this intervention by increasing the number of UM reviewers and social workers in the emergency departments. In another study, holding hospital staff meetings with managers in UM, case management, coding, billing, quality, compliance, and chief financial officers emphasized the importance to integrate departments to promote appropriate documentation and billing (Helderman et al., 2008). Similar interventions could be applied within the VA. At another small urban U.S. academic center hospital, the authors described interventions

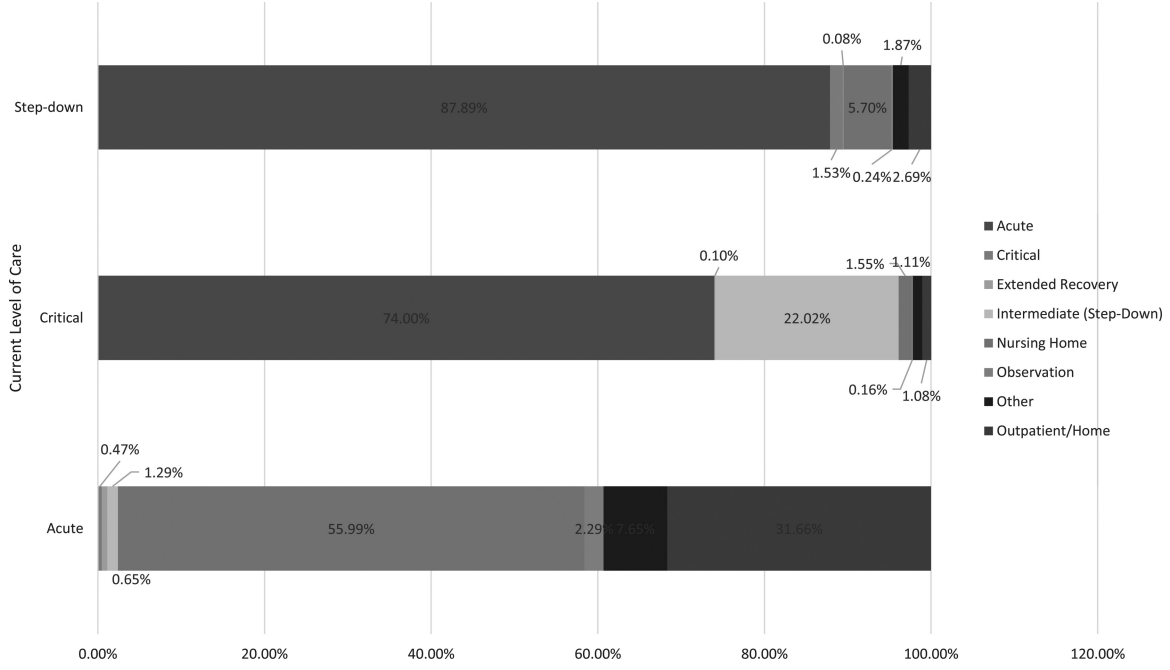

FIGURE 7
Current level of care versus recommended level of care for continued stay days not meeting criteria.

TABLE 2
Unadjusted Length of Stay by Review Outcome

Met IQ Criteria	Unadjusted LOS Mean/Standard Deviation	Median	Mode	Interquartile Range
No	10.43/(56.98)	6.0	3.0	7.0
Yes	5.11/(14.58)	3.0	2.0	3.0

Note. IQ = InterQual; LOS = length of stay.

to help avoid inappropriate surgical intensive care unit (ICU) admissions. These interventions included the development of admission guidelines, improved handoff communication, earlier end-of-life conversations, and appropriate disposition of acute patients, which could also be applied in the VA setting (Dhillon et al., 2017).

The appropriate LOC placement is important for several reasons. Unnecessary postoperative hospital days can increase costs and impact patient safety. The average cost of an inpatient bed day at a VAMC, including nursing cost, is $1,349 more in the surgical ICU than the step-down unit. Cost containment can also come from application of evidence-based criteria to prevent admissions for treatment, which could be safely delivered in the outpatient setting. Placing patients in the appropriate care setting became even more critical during the COVID-19 pandemic because of increased demand for ICU beds and adding step-down units to increase supply (Agnoletti et al., 2021). Similarly, transitioning patients from the acute inpatient setting to a tertiary setting is difficult and requires coordination between the hospital and the community setting (Zhao et al., 2018). Of note, patients awaiting placement in rehabilitation or skilled facilities no longer meet IQ criteria for their hospital stay and occupy beds needed for more acute patients.

Coordination with inpatient UM and case management staff can reduce unnecessary stays. Informing providers of their patients' LOS, especially compared with other providers, may help reduce unnecessary bed days of care and help foster a sense of accountability. Although not all delays of care are within the control of the provider, the provider can be instrumental in avoiding unnecessary bed days of care in the inpatient hospital setting that may lead to potential harm (Caminiti et al., 2013).

Unnecessary placement in the surgical ICU is avoidable and suggests inefficiencies because ICU beds are both limited and expensive resources (Dhillon et al., 2017). Placement in the ICU should be based on medical necessity and not primarily on bed availability or surgeon preference. Providers may be hesitant to move a patient from the ICU to a lower LOC during the postoperative period for several reasons. They may believe that their patients will be more closely monitored in the ICU. The surgeon may be waiting for a diagnostic test or there could be other delays when transferring patients to the surgical unit (Edenharter et al., 2019). Issues with bed availability may increase time in the ICU and have a negative impact on patient throughput. One study found that 69% of patients had avoidable time in the ICU with a mean of 23 hr avoidable time in ICU (Bagshaw et al., 2020). Depending on the patient's condition, intermediate or step-down LOC may be more appropriate than a surgical floor. Although nurse staffing ratio or nursing hours per patient day may be lower in a step-down unit than in an ICU, it is typically higher than in a medical–surgical floor and can present a cost-saving alternative to ICU care. Admission to a step-down unit versus a medical–surgical unit after an ICU stay showed a reduction in hospital mortality and ICU readmission for patients at high risk (Lekwijit et al., 2020).

It was discovered in the admission data that more than one-quarter of patients were admitted for care that could have been safely delivered in an outpatient setting. For example, some patients were admitted prior to the day of surgery for preoperative tests such as cardiac clearance tests, diagnostic radiology tests, or laboratory tests. There were inpatient admissions for surgeries that are commonly performed in the ambulatory surgical centers or day surgery units within hospitals such as ureteroscopy, cystoscopy, lithotripsy, laparoscopic cholecystectomy, and laparoscopic appendectomy. In the VHA, some patients may live 50 or more miles from the closest VAMC facility, which may contribute to an inappropriate hospital admission before or after surgical procedures. The VHA has case management and care coordination services that may be able to assist with the established Lodging Program to address this concern of unnecessary admissions or excessive LOS. Through the Lodging Program, temporary overnight lodging can be provided close to the VAMC for easier access to outpatient medical care such as preoperative testing. Although medical and nursing care are not part of the Lodging Program, transportation to and from the VAMC is included if desired. This is a service that providers, patients, and families may not be fully aware exists. The VA also provides temporary

lodging at some of its facilities, and this is referred to as "HOPTEL." The HOPTEL Program provides a place for patients to stay postoperatively. Note, this is not a hospital admission, and the patient must be medically cleared for this LOC. These services can be used to help prevent unnecessary bed days of care with expert care coordination. The Lodging and HOPTEL Programs are not appropriate for those waiting for placement in a rehabilitation unit, skilled nursing unit, or those needing custodial care because nursing care is not included in these programs.

The implications for case managers are to collaborate with surgery service to ensure that strong processes are in place to review surgical admissions. Surgeons and their staff must work early with case managers to make sure that there is timely discharge to rehabilitation or home health services. To avoid admitting patients who do not live in proximity to the hospital prior to surgery, consider using hotel lodging services, as used in the VA, for lodging patients and their families off-site prior to their procedure.

Limitations

There were limitations of the study that should be acknowledged. First, the age and gender of the sample may not be representative of those seeking surgical services outside of the VHA. The variance in LOS data may raise questions about the overall generalizability of the criteria used. Furthermore, chronic or comorbid conditions were not considered in the analysis but may have had an impact on the overall LOS. Despite the limitations, this study successfully used data from multiple hospitals to identify system inefficiencies that may lead to unnecessary financial burdens and avoidable bed days of care.

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Appendix A
Level of Care Definitions

Observation	Hemodynamically stable patients who require at least 6 hr and, for certain conditions, up to 48 hr of treatment or assessment pending a decision regarding the need for additional care. Observation level of care services may be provided in designated observation units or on a hospital floor. Psychiatric observation level of care is utilized for acute treatment of certain emergent psychiatric presentations that can be rapidly assessed and stabilized.
Acute	Hemodynamically stable patients who require treatment, assessment, or intervention every 4–8 hr.
Critical	Hemodynamically unstable patients (or those with the potential to become unstable) who require treatment, assessment, or intervention every 1–2 hr.
Intermediate step-down	Hemodynamically stable patients who require treatment, assessment, or intervention every 2–4 hr.

Appendix B
Acronyms

BDOC	Bed day of care
CLOC	Current level of care
CDW	Corporate Data Warehouse
ICU	Intensive care unit
IQ	InterQual
IRB	Institutional review board
LOC	Level of care
LOS	Length of stay
NUMI	National Utilization Management Integration
RLOC	Recommended level of care
UM:	Utilization management
VA:	Veterans Administration
VAMC:	VA Medical Centers
VHA	Veterans Health Administration

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