

Strategies for Reducing Potentially Avoidable Hospitalizations for Ambulatory Care–Sensitive Conditions

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ABSTRACT

PURPOSE Hospitalizations for ambulatory care–sensitive conditions (ACSCs) are seen as potentially avoidable with optimal primary care. Little is known, however, about how primary care physicians rate these hospitalizations and whether and how they could be avoided. This study explores the complex causality of such hospitalizations from the perspective of primary care physicians.

METHODS We conducted semistructured interviews with 12 primary care physicians from 10 primary care clinics in Germany regarding 104 hospitalizations of 81 patients with ACSCs at high risk of rehospitalization.

RESULTS Participating physicians rated 43 (41%) of the 104 hospitalizations to be potentially avoidable. During the interviews the cause of hospitalization fell into 5 principal categories: system related (eg, unavailability of ambulatory services), physician related (eg, suboptimal monitoring), medical (eg, medication side effects), patient related (eg, delayed help-seeking), and social (eg, lack of social support). Subcategories frequently associated with physicians' rating of hospitalizations for ACSCs as potentially avoidable were after-hours absence of the treating physician, failure to use ambulatory services, suboptimal monitoring, patients' fearfulness, cultural background and insufficient language skills of patients, medication errors, medication nonadherence, and overprotective caregivers. Comorbidities and medical emergencies were frequent causes attributed to ACSC-based hospitalizations that were rated as being unavoidable.

CONCLUSIONS Primary care physicians rated a significant proportion of hospitalizations for ACSCs to be potentially avoidable. Strategies to avoid these hospitalizations may target after-hours care, optimal use of ambulatory services, intensified monitoring of high-risk patients, and initiatives to improve patients' willingness and ability to seek timely help, as well as patients' medication adherence.

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INTRODUCTION

Reducing the number of avoidable hospitalizations provides opportunities for reducing health care spending and improving both quality of care and quality of life. Avoidable hospitalizations are associated with high and rising costs, and they disrupt elective health care planning and affect patients' daily life.¹ In 1993 Billings et al categorized conditions according to their likelihood of being avoidable through timely and effective ambulatory care, including specialized ambulatory care in many countries such as Germany and the United States.² Hospitalizations for ambulatory care–sensitive conditions (ACSCs) are potentially avoidable by preventing the onset of disease, controlling an acute episodic illness, or managing a chronic condition effectively.² Since the 1990s different sets of ACSCs have been described in the United States, United Kingdom, Spain, and other countries with the aim of reducing avoidable hospitalizations by optimal ambulatory—particularly primary—care.³

In the United States, the Agency for Healthcare Research and Quality (AHRQ) used hospital inpatient discharge data to develop a set of Prevention Quality Indicators to assess ACSCs as an indicator for access to appropriate primary health care.⁴ The Affordable Care Act calls for a Medicare Shared Savings Program, which would provide payments to new accountable care organizations for improved hospitalization rates for ACSCs.⁵ Although the hospitalization rate for ACSCs has been decreasing slightly in the past decade, in 2009 1,395 per 100,000 Americans were still hospitalized for ACSCs.⁶ In Germany, hospital admissions for ACSCs accounted for 38% of the 20 most frequent inpatient diagnoses in 2009.⁷

Evidence from epidemiological studies on the causes of ACSCs suggests that not all the causal factors are "under [primary care] provider control."^{11,8,9} Factors outside direct physician control include low socioeconomic status, cultural background, older age, availability of care providers, or geographical factors (eg, distance to hospital).¹⁰ Concerns have therefore been raised about the assumption that optimal primary care would prevent hospitalizations for ACSCs.^{11,12} There is limited evidence about how primary care physicians rate these hospitalizations or view the causes that, if managed, could potentially reduce the number of hospitalizations. To gain an understanding in this area, we explored hospitalizations for ACSCs identified from insurance claims data in Germany, which we then discussed in comprehensive case audits with treating primary care physicians.

METHODS

This study was part of a wider set of studies, developed using the Medical Research Council Framework,¹³ to design a primary care practice-based care management intervention targeted at patients with chronic diseases and a high risk of future hospitalizations.^{14,15} This study was approved by the Institutional Review Board of the University Hospital Heidelberg (S-052/2009).

Recruitment and Sampling

In May 2009, we invited 79 general practices in 2 regions of Northern Baden-Wuerttemberg (Germany) to participate. This sample comprises all practices enrolled in a primary care-centered contract of the General Regional Health Fund (AOK). We invited all primary care physicians working in the practices who agreed to take part in a semistructured interview. All participating physicians gave written informed consent for digital recording, transcription, analysis, and depersonalized publication of the results.

We identified hospitalizations for ACSCs using insurance claims data for hospital admissions in 2008 obtained from 333 AOK beneficiaries with a high risk of hospitalization in 2009-2010 as predicted by the case finding software package DxCG (CSSG 0.6, Verisk Health).¹⁶ In a multivariate logistic regression model, the risk of hospitalization was computed from insurance claims data that included inpatient and outpatient diagnoses, age, sex, medication, and prior health care utilization. Patients whose predicted likelihood of at least 1 hospitalization in the subsequent 12 months was higher than the 90th percentile of the study population were identified as high-risk patients.¹⁷

To identify cases of hospitalizations for ACSCs in the sample of high-risk patients, all primary inpatient diagnoses in 2008 were electronically screened for an established set of ACSCs³ by an academic health services researcher (T.F.). This set included the 6 conditions commonly used by the AHRQ.⁴ In addition, 19 conditions were selected by the health services researcher, a nursing scientist (C.M.), and a general practitioner (F.P.K.) from a list of internationally recognized conditions³ according to their frequency among primary inpatient diagnoses in Germany. The conditions included are shown in the Supplemental Table, available at <http://annfammed.org/content/11/4/363/suppl/DC1>.



Case Audit Interviews

Each participating physician was mailed a depersonalized list of all of his or her AOK patients who were hospitalized for ACSCs in 2008. Individual physicians were able to identify the patients by recoding the pseudonyms with a personal identification list provided directly by the AOK. They were asked to prepare the audits by reviewing the relevant patients' records.

The case audit interviews were embedded within semistructured interviews. A multiprofessional team of an academic physician (F.P.K.), a nursing scientist (C.M.), and a health services researcher (T.F.) developed the open-ended interview guide based on concepts of hospitalizations for ACSCs identified from the literature.^{2,3} The guide was refined based on a pilot interview with the first participating physician by adding a question asking which physician in a group practice had been the physician responsible for the patient relevant to the hospitalization. This pilot interview was included in the final analysis, because no other questions were changed after pilot testing.

During the interviews, physicians were asked to rate every hospitalization for an ACSC according to whether it had been potentially avoidable (yes or no). Subsequently, we asked each physician to explain his or her view of the causes that led to the hospitalization. Interviews were carried out face-to-face at the practice

sites by an experienced interviewer (T.F.) between March and April 2010. Field notes were taken by an accompanying doctoral student (S.G.).

Analysis

In a first step, we aimed to explore causes of hospitalizations for ACSC as named by the physicians. We conducted computer-assisted content analysis¹⁸ using ATLAS.ti 5.2 (ATLAS.ti GmbH). All transcripts were read and open coded independently by 2 researchers (T.F., S.G.). We started with inductive coding of the first 7 interviews. Codes were independently collapsed into categories by similarity of content. During a consensus meeting, major categories (principal themes) and subcategories were derived and discussed until mutual agreement was reached. In an iterative process, the categories were refined with the data from the remaining interviews.

In a second step, every case was independently coded by 2 authors (T.F., S.G.) using the subcategories of causes derived from step 1. Anchor citations were used as a coding guide.¹⁸ Coding discrepancies were discussed and resolved by the 2 raters on the basis of the transcripts.

We used descriptive statistics to explore causes attributed to hospitalization for ACSC rated to be potentially avoidable or not. All statistical analyses were performed using IBM SPSS Statistics 20 (International Business Machines Corp).

RESULTS

Of the 79 practices invited to participate, 10 practices agreed (13%). Five practices reported reasons for declining participation (4 lacked time, 1 mainly provided pediatric care). Twelve of the 14 primary care physicians working in the participating practices agreed to take part in a semistructured interview (2 refused because of time constraints). We identified 104 hospitalizations for ACSC in 81 high-risk patients from these 10 practices to be discussed in the case audit interviews.

A mean of 9 hospitalizations for ACSC were discussed with each of the physicians (ranging from 1 to 22 hospitalizations). Interviews lasted on average 67 minutes (36 to 100 minutes) and were digitally recorded and transcribed verbatim (S.G.). Table 1 shows the characteristics of the 12 interviewed physicians and the 81 patients included in the case audits.

Potentially Avoidable Ambulatory Care–Sensitive Hospitalizations

The physicians rated 43 of the 104 hospitalizations (41%) to be potentially avoidable. Table 2 displays details about the distribution of causes between the hospitalizations rated to be potentially avoidable or not.

A mean of 2.5 causes (SD = 1.4, range 1-6) were attributed to each hospitalization. System-related causes were attributed to 30 (29%), physician-related causes to 32 (31%), medical causes to 101 (97%), patient-related causes to 83 (80%), and social causes to 20 (19%). The most frequent combinations of causes in a single hospitalization were medical and patient-related cause (12); physician-related and medical cause (10); and physician-related, patient-related, and medical cause (6). Hospitalizations for congestive heart failure were most frequent (19%; 20 of 104), with 40% of the hospitalizations (8 of 20) rated to be potentially avoidable.

Causes of Ambulatory Care–Sensitive Hospitalizations

Five principal categories of explanations and causes for hospitalizations were identified: system level, physician level, medical causes, patient level, and social level. Responsibility for the treatment of patients identified as having had a hospitalization for ACSC was solely with the participating physician, even when this doctor worked in a group practice. We report the English translation of the anchor citations used for consecutive coding of the material. We observed theoretical saturation regarding the attributable causes of hospitalization for ACSC after the first 7 interviews (discussing the first 90 hospitalizations from 67 patients). The quotations were chosen on grounds of representativeness and are intended only for illustrative purposes.

System Level

Three distinct system-level causes (subcategories) were identified as consequences of the design and setting of the German health care system (Table 2).

Table 1. Characteristics of Primary Care Physicians and Patients

Characteristics	Value
Physicians, No.	12
Age, mean (SD), y	54 (8)
Female, No. (%)	3 (25)
Work experience, mean (SD), y	18 (10)
Working in solo practice, No. (%)	5 (42)
Location of practice, No. (%)	
Urban	5 (42)
Suburban	4 (33)
Rural	3 (25)
Patients, No.	81
Age, mean (SD), y	74 (11)
Female, No. (%)	44 (54)
Hospital admissions in 2008, mean (SD), No.	2.22 (1.30)
Hospitalizations for ACSCs in 2008, mean (SD), No.	0.94 (0.56)

ACSC = ambulatory care–sensitive condition.

After-hours care in Germany is mostly centralized and not delivered by a patient's personal physician. The absence of the treating physician after office hours was identified as the primary cause of hospitalizations for ACSC by most physicians.

This woman had been admitted to the nursing home for the first time. She was 87 years of age. This [acute dyspnea] occurred at Christmas. She might have been affected by the temporary absence of her physicians (Physician 3, urban practice, male, 50 years).

Most physicians reported that the skills or services required to provide some ambulatory care medical procedures are not always available or reimbursed in German primary care. One physician, for example, referred to how non-German-speaking patients are not eligible for diabetes education programs, which, in his view, contributed to one hospitalization, as programs in a foreign language were available only for inpatients.

Some physicians, however, stated how other ambulatory services that can be provided (eg, elective cardiac catheterization in patients with angina) are underused in ambulatory health care, thereby resulting in potentially avoidable hospitalizations.

Physician Level

Most physicians mentioned that diagnostic uncertainty regarding signs and symptoms of ACSCs can necessitate a second professional opinion from a hospital specialist.

These patients with coronary heart disease—I mean there are some patients who frequently have symptoms. Finally, you cannot do a lot against their symptoms and it depends on, if you have steady nerves.... However, retrospectively you can say this admission was avoidable. But you have to be quite certain about your diagnosis if you decide not to admit such a patient" (Physician 9, urban practice, male, 56 years).

Nearly all physicians reported that, in some cases, ambulatory treatment prescribed or offered by the treating physician and ambulatory specialists had failed to relieve symptoms in patients with ACSCs. One-half of the participating physicians mentioned that they could have monitored the patient more frequently.

If we would have asked her more frequently: How are you doing?—the classic opening question—we may have found that she is in serious trouble and needed far more help than she declared (Physician 4, rural practice, male, 42 years).

Medical Causes

Undesirable side effects, such as gastrointestinal bleeding that was caused by anticoagulants, resulted in some hospitalizations. Additionally, nearly all physicians reported that initial symptoms sometimes suggested a medical emergency (eg, unstable angina pectoris) or a major somatic comorbidity that could be causally linked with a hospitalization.

He had massive diarrhea. Over 80 years of age, heart disease, diabetes, hyperlipidemia, arterial hypertension—a treasure box of diagnoses. He's vulnerable, isn't he? (Physician 2, urban practice, male, 68 years).

Major psychiatric comorbidities, such as depression, anxiety disorders, and schizophrenia, were also mentioned as co-occurring causes of hospitalizations by a minority of physicians. Some hospitalizations were directly or indirectly caused by substance abuse (mainly alcohol abuse) or falls (Table 2).

Table 2. Primary Care Physicians' Ratings of Ambulatory Care–Sensitive Hospitalizations (N = 104)

Attributed Causes ^a	Potentially Avoidable No. (%)	Not Avoidable No. (%)
Total	43 (41)	61 (59)
System level	19 (63)	11 (37)
Absence of treating physician	7 (70)	3 (30)
Unavailability of ambulatory services	5 (50)	5 (50)
Failure to utilize ambulatory services	7 (88)	3 (12)
Physician level	12 (38)	20 (62)
Diagnostic uncertainty	2 (25)	6 (75)
Ambulatory treatment failure	4 (24)	13 (76)
Suboptimal monitoring	6 (86)	1 (14)
Medical	19 (19)	82 (81)
Medication side effects	1 (17)	5 (83)
Medical emergency	0 (0)	33 (100)
Somatic comorbidity	9 (24)	29 (76)
Psychiatric comorbidity	3 (33)	6 (67)
Substance abuse	2 (33)	4 (67)
Fall	4 (44)	5 (56)
Patient level	45 (54)	38 (46)
Fearfulness	7 (64)	4 (37)
Cultural background	5 (56)	4 (45)
Insufficient language skills	6 (67)	3 (33)
Delayed help seeking	5 (71)	2 (29)
Medication error	4 (100)	0
Medication nonadherence	11 (52)	10 (48)
Nonmedication nonadherence	6 (38)	10 (63)
Cognitive impairment	1 (17)	5 (83)
Social level	9 (45)	11(55)
Lack of social support	5 (46)	6 (55)
Overprotective caregiver	3 (75)	1 (25)
Overstrained caregiver	1 (20)	4 (80)

^a Multiple causes could be attributed to each ambulatory care–sensitive hospitalization.

Patient Level

Most physicians referred to patients' fearfulness as a crucial feature of some hospitalizations.

He enjoys his life. But whenever he gets worse, he is a different person. Since he had this myocardial infarction, he has been very fearful with his chest pain. That night he went directly to the ER without seeing a doctor before (Physician 2).

In a number of cases, physicians also referred to the cultural background of the patient as a factor contributing to hospitalization. In addition to cultural aspects, insufficient language skills by patients were also viewed as contributing factors by many participants. In some cases, patients or their caregivers had delayed seeking help, which had resulted in the hospitalization, as reported by one-half of the participating physicians.

Urinary tract infections could be treated at home. But the patient should have called me earlier. I would have done a home visit in X to give her oral antibiotics and the advice to increase fluid intake (Physician 2).

Some physicians also referred to patient-related medication errors as a cause of some hospitalizations, mainly in cases of diabetes therapeutic regimens.

Nonadherence to prescribed medication by patients emerged as an essential cause of hospitalizations by nearly all of the interviewed physicians, either regarding medication or nonmedication treatment.

He continues smoking despite repeated smoking cessation counseling. He takes his medicine quite infrequently. Atrial fibrillation, he is on Warfarin, taking it very infrequently, too. INR checks are frequently out of range. [...] He ignores medical advice! (Physician 9).

In some cases, physicians reported cognitive impairment to be related to hospitalization.

Social Level

Three social issues were attributed by physicians to be causes of hospitalization: lack of social support, overprotective caregivers, or overstrained caregivers. Lack of social support was identified by most physicians as a contributing factor in a number of cases.

Just imagine this lady being alone at home with that blood pressure! She might obsess about her blood pressure resulting in further increase. That's why I admitted her. She appreciated being admitted to hospital and went home after some days (Physician 2).

Perceived overprotective caregivers were also reported by 3 physicians as being related to hospitalization.

Overprotecting spouse! She always tells him what to do! He felt sick and she made him go to the ER. Bacterial pneumonia, we could have treated this at home without any problems. This was a completely avoidable hospitalization! (Physician 2).

Finally, some physicians referred to how an overstrained caregiver may also be a factor contributing to hospitalization.

DISCUSSION

The physicians rated 41% of hospitalizations for ACSCs to be potentially avoidable. The complex causality of these hospitalizations was categorized into system-related, physician-related, patient-related, medical, and social factors.

Strengths and Limitations of the Study

Causes of hospitalizations for ACSC were explored through comprehensive case audits. We included the perspective of treating primary care physicians, who know patients' complex clinical and social situations, therefore going beyond administrative data. As differing sets of hospitalizations for ACSCs limit the generalizability of results, we used common and accepted conditions that have been used for studies in the United States and internationally.³

Our study has limitations. First, the perspective of patients and caregivers were not included and should be explored in further studies. Second, we included a rather small sample of primary care physicians in 1 geographic area. The sample is representative of physicians in Germany regarding age, sex, and practice size,¹⁹ although we were not able to perform a formal nonresponder analysis. Furthermore, theoretical saturation occurred during the case audit interviews, minimizing the risk of missing relevant causes of the hospitalizations. Observational studies with larger sample sizes are recommended, however, to confirm our findings.

Third, we selected a purposive sample of patients at high predicted risk of future hospitalization who had been admitted for an ACSC, which may have contributed to selection bias and limits generalizability. Even so, we focused on real-life causes of hospitalizations for ACSCs in high-risk patients, because this population is increasingly seen as a target for interventions to reduce such hospitalizations.¹ Finally, interpretation of our results may be limited by the different national systems in which hospitalizations for ACSC are identified.

The concept of hospitalization for ACSC has increasingly been linked with quality issues.³ The underlying assumption that these conditions are potentially manageable without a hospitalization has led to the mis-

interpretation that every such hospitalization automatically indicates poor quality of care.^{11,12} Existing evidence on causes leading to hospitalization for ACSC relies mainly on administrative data, such as insurance claims or hospital discharge abstracts.⁹ These data sources offer advantages, including large sample sizes, broad geographic coverage, and the ability to link records longitudinally.¹² Administrative data, however, lack nuanced information that may be essential in determining whether a hospitalization could have been avoided (eg, severity of disease, social factors, and patients' concerns and expectations).¹¹ Published estimates of the proportion of avoidable readmissions and emergency admissions cover a wide range (5% to 79% and 6% to 20%, respectively),^{20,21} although they are based on highly heterogeneous methodologies that limit generalizability. Our study highlights the importance of a more differentiated view of hospitalizations for ACSC as an indicator for the quality of primary care by combining data from insurance claims and comprehensive case audits with treating physicians who are aware of the complex causality of potentially avoidable hospitalization.

Even though the conditions included in our study are principally managed in ambulatory care, different complex causes contributed to hospitalizations. Some causes may be attributable to primary care (eg, suboptimal monitoring), whereas others may not (eg, medical emergency). The American Medical Association report on patient safety concluded that very little is known about patient safety in primary care, and even less is known about how to improve it.²² From the perspective of the physicians in our study and based on avoidability ratings, some causes of hospitalizations for ACSC are under the direct control of primary care more than others. We identified a lack of continuity of care as a cause of potentially avoidable hospitalization. Overall, higher continuity of care with a primary care physician has been associated with lower admission rates in different settings.^{23,24} Physician-related factors, such as lack of confidence, risk aversion, or a lack of awareness of alternatives for hospital admissions, have been found to be causally related to after-hours admission rates.^{25,26} Although after-hours hospitalizations may indicate good care from a patient's safety perspective, preventing the need for patients to use after-hours care may also reduce such hospitalizations.

Addressing failure to use ambulatory care services is another actionable target for reducing hospitalizations for ACSC and may indicate poor quality of care. Access to exist-

ing specialized ambulatory care services may need to be improved, even in countries with low barriers to secondary care (as in Germany). Referral to specialized ambulatory services that are safe and effective for patients may help to reduce hospitalizations for such conditions as coronary heart disease.

Suboptimal monitoring was identified as a physician-related cause of hospitalization that could have been avoided if deteriorating symptoms had been detected earlier. There have been attempts to enhance patient monitoring either by telemedicine or disease or case management.^{1,27} Evidence of the effectiveness of increased monitoring in reducing hospital admissions is conflicting, however. It may be helpful to focus interventions on patients at higher risk for future hospitalizations and on those who are care sensitive, eg, willing and able to participate in chronic care services.¹⁷ Good quality of care encourages patients to self-monitor and manage symptoms and to seek timely help as necessary. That some patients did not seek timely help resonates with our finding that patients' inertia (delayed help seeking) was a relevant cause of potentially avoidable hospitalization. Previous studies have explored help-seeking behavior by focusing on issues based on sex of the patient,²⁸ ethnicity,²⁹ or the physician-patient relationship.³⁰ Delayed help seeking

Table 3. Implications for Primary Care Practice and Policy

Implications for primary care practice teams

- Identification of patients at high risk for hospitalization for ACSCs by complementing predictive modeling with assessment of patients' social situation, medication adherence, and self-management capabilities
- Regular medication review (what medication is taken and how?), easy-to-read medication schedules, and shared treatment plan among patients, caregivers, and physicians to improve adherence
- Regular (telephone-) monitoring of symptoms and treatment adherence in high-risk patients
- Self-management training of patients and caregivers (eg, should enable them to manage acute deterioration or to seek timely help of primary care resources)
- Identification of existing social support systems (eg, family, friends, neighbors) and community resources
- Health technology systems (eg, recall system for monitoring, updated links to community resources and ambulatory services, shared medical records between primary care practices and hospitals/after-hours care)
- Enhanced communication between physicians across sectors (eg, treating physicians and external physicians in after-hours care, admission and discharge management, easy access to colleagues to ask for advice in case of diagnostic uncertainty)

Implication for policy and management

- Accountability for hospitalization is shared across all sectors, including primary care, secondary care, hospitals, communities, and patients
- Hospitalizations for ACSCs do not automatically reflect poor quality of care and should be measured either on a highly aggregated level (large geographic areas) or with sufficient adjustment for its complex causality
- Selection of defined ACSCs that may in future be refined to primary care-sensitive conditions based on evidence rather than expert view
- Communication skills including cultural-sensitive medicine may be emphasized in physician education and training

ACSC = ambulatory care-sensitive condition.

could indicate poor quality of care if physicians fail to provide relevant patient education for patients and caregivers, although not every patient is willing or able to alter his or her help-seeking behavior.

Nonadherence to treatment is a known risk factor for hospitalization,³¹ and we identified it as a patient-related cause of potentially avoidable hospitalizations. Because medication adherence is negatively associated with increasing numbers of prescriptions, however, interventions targeting medication adherence face barriers in patients with multiple chronic conditions and prescriptions.³² Even so, physicians may alter medication regimens and educate patients and their caregivers to manage complex treatment to enhance medication adherence.³³

Comorbidity was mentioned and rated by participating physicians as a relevant cause of hospitalization that is not avoidable, thereby echoing evidence from epidemiological studies.³⁴⁻³⁷ This finding reflects the legitimate limitations of ambulatory care for some vulnerable highly complex patients.

Hospitalization may be indicators of either poor or good quality of care depending on the complex causes that led to it. Interventions aimed at reducing hospitalizations for ACSCs should target actionable causes at the system, practice, community, and patient level (Table 3).

A number of interventions, including patient education, proactive monitoring of symptoms, improving medication adherence, and promoting continuity of care, may help to take up the challenge of potentially avoidable hospitalizations in primary care practice. Reducing the number of avoidable hospitalizations will contribute to both increased quality of care and reduced health care expenditures.

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Key words: primary health care; ambulatory care-sensitive conditions; avoidable hospitalizations; hospitalization; multimorbidity; quality of health care

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