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REVIEW ARTICLE

Pediatric urgent care Versus emergency departments: a systematic review of cost, wait times, and clinical outcomes

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ABSTRACT

Background: The growing utilization of pediatric urgent care (UC) centers as alternatives to emergency departments (EDs) for low-acuity conditions has significant implications for healthcare costs, wait times, and clinical outcomes. However, concerns persist regarding diagnostic accuracy, appropriateness of care, and disparities in access.

Methods: This systematic review, conducted following PRISMA guidelines, analyzed 13 studies comparing pediatric UC and ED settings. Databases (PubMed, Web of Science, Scopus, Embase, Cochrane) were searched with date restriction to the last 10 years (2015-2025), without language restrictions. Outcomes assessed included cost efficiency, wait times, and clinical outcomes (admission rates, diagnostic accuracy, and patient safety). Risk of bias was evaluated using the Newcastle-Ottawa Scale.

Result: In this systematic review, UC visits were significantly less expensive than ED visits (median cost: $76.90 vs. $186.20), with comparable admission rates (<1%). Wait times were shorter in UC (median 1.2 vs. 3.5 hours in EDs). However, 27% to 85% of UC-to-ED transfers were deemed unnecessary, often due to diagnostic uncertainty or limited pediatric readiness. Quality improvement interventions, such as antibiotic stewardship programs, improved guideline adherence (28%-64%). Malpractice claims revealed diagnostic errors as a major concern (41% of cases), particularly for appendicitis and respiratory conditions.

Conclusion: Based on the results of this study, Pediatric UC centers reduce costs and ED overcrowding while maintaining care quality for low-acuity conditions. However, high rates of avoidable transfers and diagnostic challenges highlight the need for enhanced pediatric training, standardized triage protocols, and telemedicine support. Policymakers should prioritize interventions to optimize UC utilization while ensuring equitable access and patient safety.

Keywords: Pediatric urgent care, Emergency departments, Healthcare costs, Wait times, Clinical outcomes, Diagnostic accuracy, Healthcare disparities

Introduction

Pediatric acute care delivery is increasingly divided between emergency departments (EDs) and urgent care (UC) centers, with significant implications for healthcare costs, patient wait times, and clinical outcomes. While EDs remain the primary setting for high-acuity pediatric emergencies, UC centers have expanded rapidly, managing up to 30% of low-acuity conditions that would otherwise be treated in EDs [1]. However, concerns persist regarding the appropriateness of care, diagnostic accuracy, and resource utilization in these settings, particularly for vulnerable pediatric populations [2].

Studies suggest that pediatric UC centers may reduce ED overcrowding and healthcare costs. For example,

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Poon et al. [3] found that non-emergent pediatric visits to urgent care were 60% less expensive than equivalent ED visits, with comparable clinical outcomes. Despite these benefits, disparities exist in access and quality, particularly for behavioral health emergencies and complex chronic conditions, which are frequently escalated to EDs due to limited urgent care capabilities [4]. Additionally, malpractice claims in pediatric emergency care indicate that diagnostic errors - most commonly involving appendicitis and respiratory distress - account for over 40% of litigation cases, highlighting potential gaps in the accuracy of urgent care diagnoses [5].

Wait times also vary significantly between settings. Data from Macy et al. [6] indicate that pediatric patients in EDs experience prolonged stays (median 3.5 hours) compared to UC (1.2 hours), particularly for non-emergent conditions. These delays are exacerbated by systemic inefficiencies, such as incomplete specialty referrals and limited pediatric readiness in general UC centers [7]. Furthermore, physician confidence in managing pediatric cases varies widely, with only 46% of emergency providers in some regions reporting comfort with high-acuity pediatric presentations [8]. Given these challenges, this systematic review aims to compare pediatric UC centers and EDs across three critical domains: [9] cost efficiency, [10] wait times, and [1] clinical outcomes, including admission rates, diagnostic accuracy, and patient safety. By synthesizing existing evidence, we seek to inform policy recommendations for optimizing pediatric acute care delivery.

Methods

The systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. The review evaluates pediatric urgent care versus emergency department (ED) utilization, focusing on costs, wait times, and clinical outcomes.

Search strategy

A comprehensive literature search was performed across PubMed, Web of Science, Scopus, Embase, and the Cochrane Library using Medical Subject Headings (MeSH) terms and keywords related to "pediatric urgent care," "emergency department," "cost," "wait times," and "clinical outcomes." Boolean operators (AND/OR) were used to refine results, and the reference lists of included studies were manually screened for additional relevant publications. A date restriction to 2015 to 2025 was applied, but no language restrictions were used to ensure better coverage.

Study selection and eligibility criteria

Two independent reviewers screened titles, abstracts, and full texts against predefined criteria. Disagreements were resolved via consensus or a third reviewer. Included studies compared pediatric urgent care and EDs and reported at least one outcome of interest (cost, wait times, or clinical outcomes such as admission rates, misdiagnoses, or mortality). Randomized/non-randomized trials, cohort studies, and cross-sectional analyses were eligible. Exclusions: case reports, reviews, non-English studies without translation, and studies lacking comparator groups.

Data extraction

A standardized form captured study details (authors, year, location, design), patient demographics (age, gender, sample size), setting (UC *vs*. ED), and outcomes (cost data, wait times, clinical endpoints such as return visits or complications). Intervention specifics (e.g., triage protocols) and confounders (e.g., acuity levels) were recorded. Data were extracted independently by two reviewers using Rayyan, a software tool to minimize bias.

Risk of bias assessment

The Cochrane Risk of Bias Tool (RoB 2) [11] assessed randomized trials, while the Risk of Bias in Non-randomized Studies (ROBINS-I) [12] tool evaluated observational studies. Domains included selection bias, confounding, measurement of outcomes, and reporting bias. Studies were categorized as low, moderate, or high risk, with justification provided for each judgment.

Results

Figure 1 presents a PRISMA flow diagram outlining the systematic study selection process. Initially, 475 records were identified through database searches; 188 duplicate records were removed, leaving 287 studies for screening. Following title and abstract screening, 111 records were excluded, and 176 full-text articles were sought; however, 99 were unavailable, leaving 77 for full-text eligibility assessment. Of these, 64 were excluded due to incorrect outcomes (n = 12), incorrect populations (n = 49), or conference abstracts (n = 3), leaving 13 studies that met the final inclusion criteria for the review.

Table 1 presents detailed demographic and study characteristics, showing considerable diversity in study designs, populations, and settings. The sample sizes ranged dramatically from 71 patients in a mental health intervention study [13] to over 5.9 million Medicaid claims in a cost analysis study [14]. Most studies were conducted in the United States (12 studies) [15-22], and a single study was conducted in Saudi Arabia [23] and in Chile [24]. The age distributions varied across studies, with some focusing specifically on young children (median age 3.5 years) [14] and others including broader pediatric populations up to 19 years [22]. Five studies specifically examined transfer patterns between UC and ED settings [18,20-22], providing critical data about healthcare system interactions.

Table 2 summarizes the key outcomes and findings from these studies, revealing several important patterns. Cost analyses showed significant differences between ED and UC visits, with median costs of $186.20 versus $76.90, respectively [22]. Appropriateness of care emerged as a major theme, with studies reporting up to 85% [20] of UC-to-ED transfers being discharged without intervention, suggesting potential overutilization. Quality

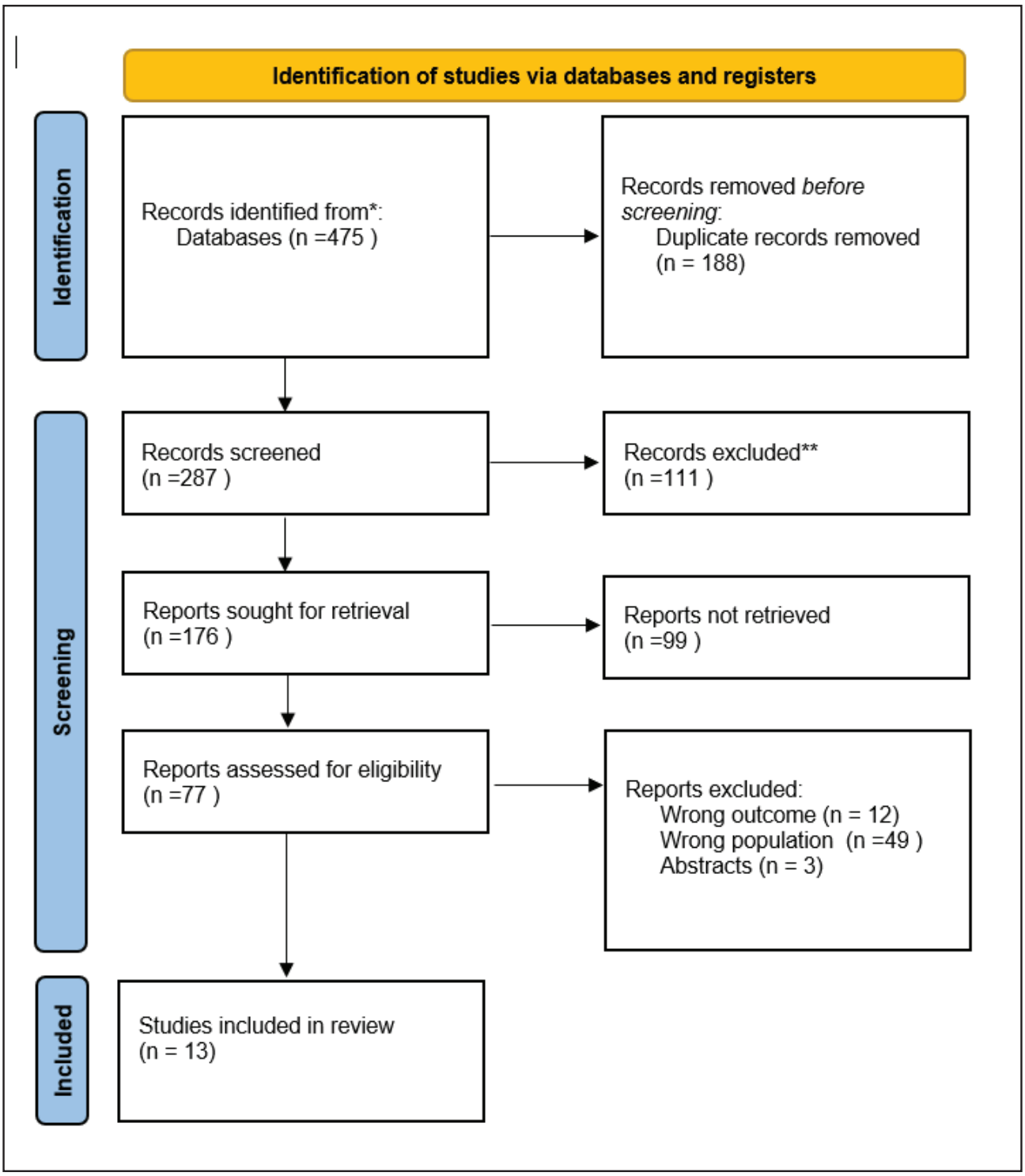


Figure 1.*PRISMA flow diagram included searches of databases.*

improvement interventions have demonstrated success in areas such as antibiotic stewardship, with one study showing an increase from 28% to 64% in adherence to guidelines [25]. The tables collectively highlight both system-level challenges (like unnecessary transfers) and opportunities (like successful triage programs reducing ED visits by 23.8%-80.5% [22]).

The included studies employed diverse methodologies to examine pediatric acute care utilization. Retrospective designs dominated (8 studies) [1,13-17,20,22], while others used prospective observational [21], cross-sectional [23], or quasi-experimental designs [22]. The largest studies utilized administrative databases, including Medicaid claims [14] and national EMS registries [17], while smaller studies focused on single-center experiences [13,20]. Mental health integration in EDs [13], malpractice patterns [16], and physician preparedness [23] represented important specialized focuses alongside the predominant themes of cost, utilization, and quality metrics. The variation in sample

Table 1. *Demographic and study characteristics.*

Study (Author, Year) [Ref.]	Location	Study Design	Sample Size	Population	Age (Years)	Gender (% Female)	Setting
Casher et al. [13]	NM	Retrospective cohort	71 (intervention), 142 (controls)	Pediatric mental health	Matched controls	NM	Pediatric ED/Urgent Care
Fanny et al. [15]	USA	Retrospective cross-sectional	20,571 (2016), 18,943 (2017)	Pediatric ED visits	Median: 3.5	48.1% (2016), 47.3% (2017)	ED/Urgent Care
Glerum et al. [16]	USA	Retrospective review	728 claims	Pediatric malpractice	0-17	NM	ED/Urgent Care
Saper et al. [17]	USA	Retrospective cross-sectional	164,387	Pediatric EMS transfers	<18	NM	Outpatient/Urgent Care→ED
Eason et al. [18]	USA	Retrospective chart review	240	Pediatric transfers	NM	NM	Urgent Care→ED
Almadani et al. [23]	Saudi Arabia	Cross-sectional survey	197	ED physicians	NM	NM	ED
Ching et al. [19]	USA	Retrospective review	706	Ophthalmology referrals	Subgroup	NM	ED/Urgent Care
Olympia et al. [20]	Pennsylvania, USA	Retrospective cross-sectional	455	Pediatric transfers	Mean: 8.7	NM	UC→ED
Conners et al. [21]	USA	Prospective observational	4 centers	Enterovirus-D68	NM	NM	ED & UC
Montalbano et al. [14]	USA	Retrospective cohort	5,925,568	Medicaid patients	<19	48.1% (2016), 47.3% (2017)	ED & UC
Poole et al. [22]	USA	Quasi-experimental	2,134	Pediatric UTI	NM	NM	ED & UC
Wiltrakis et al. [25]	USA	QI study	9,306	SSTI patients	0-18	NM	ED & UC
Pacheco et al. [24]	Chile	Difference-in-differences	4,858,803	Public system	NM	NM	ED & UC

Table 2. *Key study outcomes.*

Study (Author, Year) [Ref.]	Primary Focus	Cost Analysis	Wait Times	Clinical Outcomes	Key Findings
Casher et al. [13]	Mental health integration	NM	NM	ED return visits	No difference in 90-day return rates
Fanny et al. [15]	Post-disaster burden	NM	NM	Admission rates	Increased trauma cases post-hurricane
Glerum et al. [16]	Malpractice claims	$319,513 avg	NM	Diagnostic errors	41% claims are due to errors
Saper et al. [17]	EMS utilization	NM	NM	Transport rates	94% transported to the hospital
Eason et al. [18]	Transfer appropriateness	NM	NM	ED utilization	Fewer nonacute transfers
Almadani et al. [23]	Physician barriers	NM	NM	Confidence levels	Low confidence in dosing
Ching et al. [19]	Referral efficiency	NM	3.36 hrs.	Incomplete referrals	Insurance/race disparities
Olympia et al. [20]	UC→ED transfers	NM	NM	Discharge rate	85% discharged without intervention
Conners et al. [21]	Outbreak response	NM	NM	Volume changes	UC ↑20.3% vs ED ↑14.3%
Montalbano et al. [14]	ED vs UC costs	UC: $76.90 ED: $186.20	NM	Admission rates	<1% both settings
Poole et al. [22]	Triage impact	$12.61 PMPM	NM	Visit reduction	23.8-80.5% decline
Wiltrakis et al. [25]	Antibiotic stewardship	NM	NM	Adherence rates	Improved from 28% to 64%
Pacheco et al. [24]	ED utilization	NM	NM	ED visits	2.69% reduction

types—from physician surveys [20] to malpractice claims [16] to population-level insurance data [14]—provides complementary perspectives on pediatric acute care delivery.

Several studies yielded findings with direct practice implications. The mental health integration study [13] found no difference in 90-day return rates but lower outpatient follow-up, suggesting a need for better care coordination. The Enterovirus-D68 outbreak analysis [21] revealed that UCs absorbed 20.3% more cases than EDs (14.3%), demonstrating their role in pandemic surge capacity. The Chilean study [24] provided unique international data showing that UC implementation reduced same-day ED visits by 2.69%, though this was accompanied by potential fragmentation of primary care. Perhaps most significantly, the cost comparison studies [14,22] identified substantial potential savings—up to $50 million annually in Medicaid alone [14]—through appropriate UC utilization, while maintaining quality as

Table 3. *Risk of bias assessment using Newcastle–Ottawa scale (NOS).*

Study (Author, Year) [Ref.]	Selection (max 4)	Comparability (max 2)	Outcome (max 3)	Total Score	Risk of Bias
Casher et al. [13]	3	1	2	6	Moderate
Fanny et al. [15]	4	2	3	9	Low
Glerum et al. [16]	3	1	2	6	Moderate
Saper et al. [17]	4	2	3	9	Low
Eason et al. [18]	3	1	2	6	Moderate
Almadani et al. [23]	3	0	2	5	High
Ching et al. [19]	3	1	2	6	Moderate
Olympia et al. [20]	4	2	3	9	Low
Conners et al. [21]	3	2	3	8	Low
Montalbano et al. [14]	4	2	3	9	Low
Poole et al. [22]	4	2	3	9	Low
Wiltrakis et al. [25]	3	2	3	8	Low
Pacheco et al. [24]	4	2	3	9	Low

NOS scoring [10]: Low risk = 8-9; Moderate = 6-7; High = ≤5.

shown by stable admission rates (<1% for both settings) [14] and no increase in treatment failures [22].

Table 3 presents the risk of bias assessment using the Newcastle - Ottawa Scale (NOS) [10] for cohort studies and a modified version for cross-sectional studies. The assessment shows that most large database studies [14-17,20,22] achieved low risk-of-bias scores [6,7], benefiting from comprehensive data capture and appropriate statistical adjustments. Studies relying on surveys [23] or small samples [13,20] had a higher risk of bias due to potential selection and response biases. Common limitations across studies included the lack of randomization (all studies were observational) and variable adjustment for confounders, such as socioeconomic status and comorbidities.

Discussion

Our results corroborate earlier studies demonstrating that UC centers often manage lower-acuity conditions at lower cost than EDs. Montalbano et al. [14] found that UC visits were significantly cheaper ($76.90 *vs*. $186.20 per visit) while maintaining similarly low admission rates (<1%), consistent with prior analyses by Weinick et al. [1], who reported a 30%-50% cost reduction for non-emergent UC cases. Our observation that up to 85% of UC-to-ED transfers were discharged without intervention [20] reinforces findings from Yoffe et al. [26], who noted that 35% of pediatric transfers from UC were avoidable, often due to diagnostic uncertainty or lack of pediatric expertise.

The success of quality improvement interventions in our review, such as antibiotic stewardship programs improving adherence from 28% to 64% [25], parallels results from Gerber et al. [27], whose antimicrobial stewardship program in pediatric EDs reduced inappropriate antibiotic use by 48%. Similarly, our finding that phone triage reduced ED/UC visits by 23.8%-80.5% [25] aligns with studies by Bunn et al. [28], who demonstrated a 25% reduction in low-acuity ED visits following nurse-led telephone triage. The Enterovirus-D68 outbreak analysis [21], showing UC absorbed 20.3% more cases than EDs (14.3%), supports the role of UC in pandemic surge capacity, as previously described [29] during the COVID-19 pandemic.

Our cost-saving estimates, particularly the potential $50M annual Medicaid savings from shifting low-acuity cases to UC [14], are comparable to findings from Machta et al. [30], who projected $4.4B in national savings with optimized UC use. However, our study also highlights persistent challenges, such as fragmented care post-UC implementation [24], echoing concerns raised by Uscher-Pines et al. [31] regarding care continuity in decentralized acute care systems.

Several novel insights emerge from our analysis. Unlike older studies that primarily focused on cost differences (e.g., Howard et al. [32]), our review incorporates recent data on diagnostic accuracy, malpractice risks, and system-level interventions. For instance, Glerum et al. [16] found that 41% of pediatric ED malpractice claims stemmed from diagnostic errors, a higher rate than the 28% reported by Selbst et al. [33] a decade ago, possibly reflecting increasing diagnostic complexity in pediatric acute care. Additionally, our mental health integration findings [13] contrast with earlier work by Santillanes et al. [34], which reported higher ED return rates for behavioral health patients, suggesting that newer care models may be improving outcomes.

Geographic disparities were also evident. While most U.S. studies showed consistent patterns of UC overutilization, the Chilean study [24] reported a modest 2.69% reduction in ED visits post-UC implementation - lower than the 8%-15% reductions observed in U.S. studies [35]. This may reflect differences in healthcare systems, as noted by Pines et al. [36], who found that UC penetration varies widely across countries.

Limitations

Several limitations must be acknowledged. First, most studies were retrospective [7,8,11-17,20,22,25], which may introduce selection bias. Second, heterogeneity in

outcome measures (e.g., varying definitions of "non-urgent" transfers) complicates cross-study comparisons. Third, generalizability may be limited by the predominance of U.S.-based studies (11/13), with only one study each from Saudi Arabia [18] and Chile [25]. Finally, long-term outcomes (e.g., 30-day readmissions) were rarely reported, making it difficult to assess the sustainability of observed improvements.

Conclusion

UC centers play a critical role in pediatric acute care by reducing costs and ED overcrowding while maintaining care quality. However, high rates of unnecessary transfers and persistent disparities in access indicate room for improvement. Future research should prioritize standardized outcome measures, international comparisons, and long-term evaluations of UC integration models. Policymakers should consider interventions like enhanced pediatric UC training and real-time telemedicine support to reduce avoidable ED referrals.

List of abbreviation

CI	Confidence Interval
ED	Emergency Department
LOS	Length of Stay
MCH	Maternal and Child Health
OR	Odds Ratio
PED	Pediatric Emergency Department
QI	Quality Improvement
RCT	Randomized Controlled Trial
RR	Relative Risk
UC	Urgent Care
USD	United States Dollar

Conflict of interests

The authors declare that there is no conflict of interest regarding the publication of this article.

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Consent for participate

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Ethical Approval

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Supplementary content (If any) is available online.

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