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# Improving Wait Times for Children with Caregivers with Limited English Proficiency in the Emergency Department

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**ABSTRACT**

**Introduction:** In our pediatric emergency department (ED), children triaged as low acuity who presented with Spanish-speaking caregivers with limited English proficiency (SSLEP) experienced disparately longer wait times than similarly triaged children with English-proficient caretakers. Although inequities in ED care based on language preference exist, little is known about effective interventions to eliminate the disparity. This quality improvement study aimed to eliminate the disparity in wait times and share effective interventions. **Methods:** A multidisciplinary team incorporating clinicians, professional interpreters, and data analysts utilized quality improvement methodology to introduce early identification of SSLEP children, standardize physician workflow, and optimize the interpreter process. The primary outcome was the length of stay. The secondary outcome was time to the provider. The balancing measures were revisits and non-LEP length of stay and time to the provider. Secondary analyses distinguished between the effect of our QI intervention and secular trends. **Results:** The mean length of stay for SSLEP children decreased from a mean of 178 to 142 minutes, a 36-minute (20%) decrease. Mean time to provider for SSLEP decreased from 92.8 to 55.5 minutes, a 37-minute improvement (40%). The 72-hour-revisit rates did not increase for SSLEP children throughout the project. **Conclusions:** We identified feasible interventions to improve wait times for children with SSLEP. Future directions include addressing components of the entire ED visit to decrease the length of stay discrepancies between populations. We hope to extend our findings to benefit all LEP communities. *(Pediatr Qual Saf 2023;8:e656; doi: 10.1097/pq9.0000000000000656; Published online May 23, 2023.)*

## INTRODUCTION

The US population is linguistically diverse. In 2019, 13% of US children lived with at least one parent with limited English proficiency (LEP), defined as speaking English less than "very well."[1] Patients with limited English proficiency are more likely to experience safety events, worse outcomes, and increased hospital lengths of stay (LOSs) when compared with non-LEP patients.[2–6] Eliminating health care disparities is one of the top national research priorities.

As of 2020, the Hispanic population is the largest LEP population in the US, comprising 18.7% of the total US population. 8.3% of residents in Washington, DC, speak English less than "very well."[7] In our pediatric emergency department (ED), children with caregivers with LEP experienced significantly longer LOSs than non-LEP patients. The average LOS for these pediatric patients triaged as low acuity was 30% higher than for non-LEP children. Our global aim was to eliminate this disparity in LOSs, also known as wait times. To that end, we launched an improvement quality initiative to decrease wait times for children with Spanish-speaking caretakers with limited English proficiency (SSLEP) to approximate those of non-LEP patients; we specifically aimed for a 20-minute decrease in SSLEP wait times by April 2021.

## METHODS

### *Context*

We conducted this project at an urban, academic, tertiary pediatric emergency department (ED), and level 1 pediatric trauma center with approximately 90,000 annual

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patient visits before COVID-19. ED medical providers include board-certified pediatric emergency medicine physicians, general physicians, pediatric residents, and physician assistants. Professional in-person interpreters consistently staff the ED between 11 AM and 11 PM. Phone and video interpretation services are always available in the ED. As part of the routine triage process, a pivot nurse is at the entrance of the ED. The first triage question asked of caregivers is their preferred language. The pivot nurse obtains basic triage information on all new patients and assigns an ESI score. Patients with low-acuity illnesses are assigned an ESI score of 4 or 5. In our ED, 55% of patients are ESI 4 or 5.[8]

The target population was ESI 4 or 5 patients presenting to the ED with a family member identified in triage as SSLEP. This population is the largest LEP population in our ED. The project occurred between January 2019 and April 2021.

## *Interventions*

The multidisciplinary QI team convened in January 2019. The team included PED attending physicians, clinical nurses, a nurse manager, the hospital manager of language services, members of the ED professional Spanish interpreter staff, and a data analyst. The QI team used the Model for Improvement for system transformation. Process mapping identified barriers and potential solutions for SSLEP patients. A key driver diagram translated the high-level improvement goals into a pictorial roadmap and communicated the goals to our stakeholders (Figure 1).

The implementation team identified goals and strategies, planned the interventions, and identified performance metrics. ED Spanish interpreters were instrumental in disseminating information to the staff and collecting weekly feedback for subsequent plan-do-study-act (PDSA) improvement cycles. We conducted multiple sequential PDSA cycles to study and optimize the new processes, care delivery, and patient flow metrics. Teams met biweekly to evaluate real-time feedback and plan the next PDSA cycles. They used PDSA cycles from August 2019 to March 2021 to inform strategic interventions.

Areas for top target interventions included: early identification of SSLEP patients, standardized physician workflow, optimized interpreter process, provider education, and frequent feedback.

### Early Identification

To identify these patients at the start of the ED encounter, we introduced an LEP icon into the electronic medical record (EMR) in January 2019. If a patient or family identified as LEP and agreed to an interpreter, the triage nurse launched the icon on the tracking board. The goal of the icon was to alert staff about the patient's LEP status, so interpreter services could be arranged as early as possible in the encounter. The first PDSA revealed that the icon was seldom used because the data entry required to launch the icon was cumbersome and prohibitive. The need for rapid patient processing in triage made it challenging for triage nurses to complete 12 data questions to launch the LEP icon. Based on nursing feedback, the team revised the data entry required to launch the icon and eliminated unnecessary questions. The icon remained

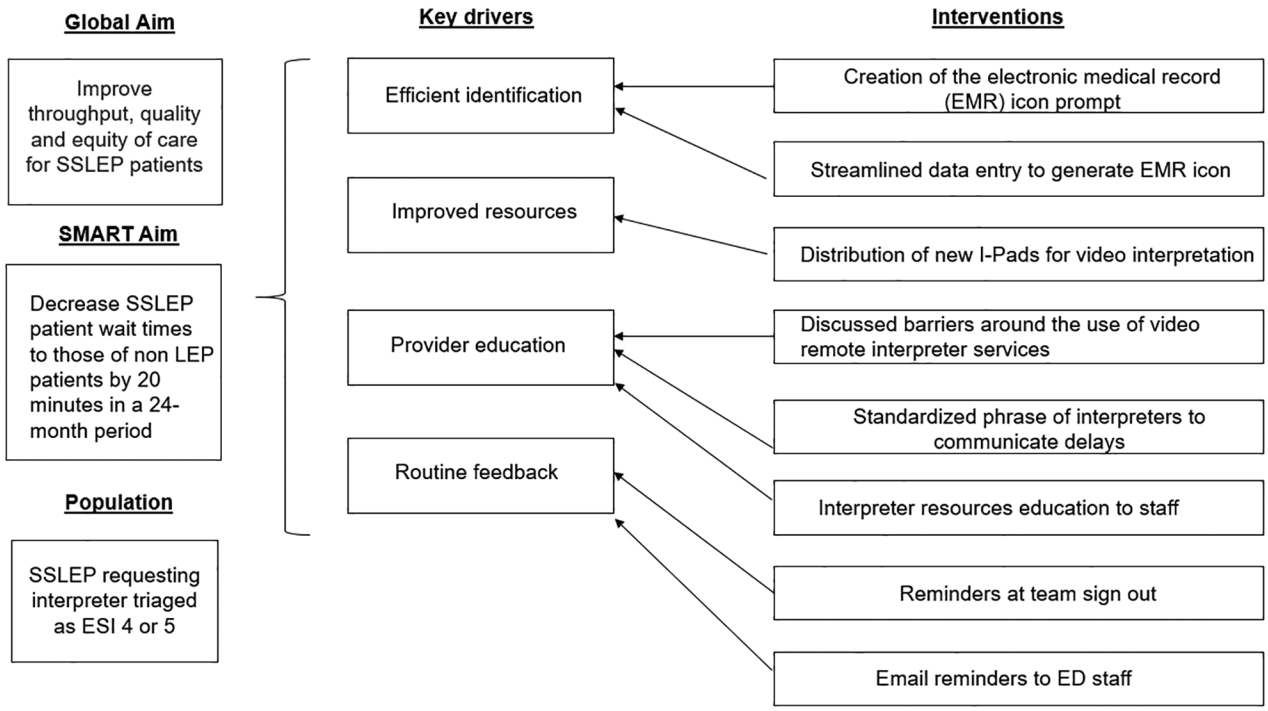


**Fig. 1.** Key driver diagram.

visible for the duration of the patient visit. Any team member could launch it anytime during the patient visit if the icon was not launched in triage.

**Standardized Physician Workflow**

Physician preference for in-person interpreters created extended wait times for patients and families. Over a series of workshops with staff, we discussed balancing provider preferences with patient throughput. Using provider input, we implemented a best-practices advisory flowchart in November 2019; if the in-person interpreter was unavailable within 10 minutes of request, the providers agreed to use a video or phone interpreter (**See figure, Supplemental Digital Content 1,** Best Practices Flowchart, ***http://links.lww.com/PQ9/A483***). We also discovered that new staff were often unaware of the different available modalities for language services and incorporated this training into new-hire orientation.

Process mapping revealed that inefficient use of the in-person interpreter was a common source of prolonged patient throughput. The in-person interpreter was frequently paged several times for different components of a patient visit. For example, an interpreter would be present for triage nurse intake with the patient, then dismissed, only to be paged by the provider for the provider history and physical, then dismissed, only to be paged again later by the discharge nurse for discharge instructions. We instructed providers and nurses to swarm the LEP patient with an interpreter to address this inefficiency. Swarming is the practice of provider and nurse jointly collecting patient history, and physical and vital signs.[9] Patients who do not require laboratory analysis, imaging, or other interventions can benefit from decreased wait times if the care team swarms the patient. Swarming with the interpreter creates a more efficient workflow for the interpreter, patient, and care delivery team.[10]

**Removal of Technological Barriers**

Phone and video interpreter services were available but inconsistently used. Staff identified technical barriers to using phone and video services. Barriers included difficulty accessing timely IT support during a clinical shift. For example, IT support was unavailable for several hours when a wireless connection was not functioning for the video service. We collaborated with the IT department to identify real-time technical assistance with our hospital's video interpreter services to address this challenge. Algorithms for technological assistance were devised and shared with staff via emails and at team sign-outs. Laminated basic and troubleshooting information cards were attached to the video hardware. We distributed badge cards with instructions for accessing professional phone interpreters. (**See figure, Supplemental Digital Content 2,** Phone Badge Cards, ***http://links.lww.com/PQ9/A484***.) Our interpreters volunteered as the first resource for providers unfamiliar with the technology. Physical barriers to video and phone resources were addressed with dedicated storage and device-charging stations.

**Optimized Interpreter Process**

Before the QI intervention, 2 interpreters covered all pods of the ED without specific pod assignments or dedicated work phones. At QI meetings, interpreters shared the challenges of limited interpreter availability-to-patient demand ratios, frequent interruptions, prioritizing provider requests, and underutilized professional interpreter modalities that created work inefficiencies. For example, phone call interruptions while interpreting were common and disruptive to the interpreter during the patient encounter. As a result, interpreters would advise the caller to contact another interpreter, creating inefficacies for the provider, or request a few more minutes to arrive at the bedside.

To streamline the process, we assigned interpreters to pods. One interpreter was stationed and responsible for the triage area and contiguous low-acuity pod. A second interpreter covered the main ED. Each interpreter carried a dedicated phone number. The phone numbers were posted and disseminated among staff. If an interpreter received a call while in a patient room and thought it would take over 10 minutes, they had a script to acknowledge the anticipated delay and encourage the provider to use video or phone services. In addition, we provided scripted dialogue for interpreters to facilitate patient swarming and to encourage providers to review discharge papers for eligible patients while the interpreter was still in the room.

**Routine Feedback and Education**

To further improve compliance, the team disseminated a visual graph illustrating ongoing improvement. Also, staff were reminded about efficient interpreter processes and available modalities at team sign-out. Quarterly emails reinforced this message.

### *Measures*

Our primary outcome measure was the LOS for low-acuity SSLEP patients, defined as the time from triage to disposition. Our secondary outcome measure was time to the provider (TTP), the time from patient triage to the time seen by the provider. Finally, the balancing measure was the ED return rate within 72 hours.

**Data Collection**

We extracted all data from the EMR and the ED tracking system (Cerner FirstNet, Cerner Corporation, Kansas City, Mo.). Because a key component of our intervention was the professional Spanish interpreters, we focused on data between 11 AM and 11 PM when the interpreters consistently staffed the ED. Collected data included patient acuity level, time of arrival, time seen by the provider, time of disposition, interpreter use, and revisit information. Consistent with our usual practice, we excluded patients with implausible data caused by computer entry errors. For example, patients were excluded if admitted to the hospital, left without treatment, or if the presenting complaint was primarily psychiatric, behavioral, or social (eg, concern for abuse) because these patients have extended wait times.

### *Analysis*

We used statistical process control (SPC) XMR charts (QI Macros, version 2020; Know Ware International Inc, Denver, Colo.) to measure the effects of our interventions over time. Xbar S charts are a more sensitive chart, but we believed that the simpler I charts of monthly averages provided enough sensitivity to evaluate the impact of our interventions.

We used data leading up to the implementation of the initial intervention to calculate the baseline centerline and control limits. The baseline period was from January 2018 to January 2019. The intervention period was from January 2019 to March 2020. Significant shifts in the measures (ie, special cause variation) were identified using traditional rules for patterns on SPC, including 8 consecutive measurements persistently above or below the mean, 2 of 3 consecutive data points at the outer third of upper or lower limits, or 6 consecutive points trending up or down.[11] We calculated new control limits and centerline if a sustaining system shift was observed.

Our normal ED volumes were disrupted during the COVID-19 pandemic. Therefore, we performed 2 secondary analyses to distinguish between the effect of our QI intervention and secular trends. First, we adjusted the SPC charts for changes in ED patient volumes based on QI methodology introduced by Berkowitz, Provost, and Chamberlain in 2019.[12] This methodology controls for the effects of variation due to patient volume.[12] Even before COVID, EDs were subject to changes in patient volumes secondary to seasonality, viral presence, and even the day of the week. Second, we tracked LOS and TTP for non-LEP patients. We compared the slopes of the graphs of our primary outcome measures over time in both SSLEP and non-LEP groups. Non-LEP data also served as a secondary balancing measure to ensure that our intervention was not increasing the LOS for non-LEP patients.

### *Ethical Considerations*

This project was undertaken as a quality improvement initiative at Children's National Health Systems and was determined by the institutional review board not to constitute human subjects research (IRB0013859). The authors have no financial interest to declare concerning the content of this article.

## RESULTS

A total of 54,804 low-acuity, ESI 4 or 5 patients presented to the ED between August 2018 and April 2021: 9,383 low-acuity SSLEP (18%) and 45,421 (82%) non-LEP patients. After the interventions, the mean LOS for SSLEP families decreased from 178 minutes to 142 minutes, a 36-minute improvement (20.2%) (Fig. 2). In contrast, the mean LOS for non-LEP patients decreased from 136 minutes to 124 minutes, a 12-minute decrease (8.8%) (Fig. 3).

The mean TTP times for SSLEP families decreased from 92.8 to 55.5 minutes, a 37-minute improvement (40.2%) (Fig. 4). TTP times for non-LEP families decreased from 72.6 minutes to 45.5 minutes, a 27-minute decrease (37.3%) (Fig. 5).

The balancing measure of 72 hour revisit rates did not increase for SSLEP children throughout the duration of the improvement project (Fig. 6).

Improvement in the mean of LOS and TTP for SSLEP families began 3 months before the first SARS-COVID-19 patient arrived at our hospital and continued a year after the intervention.

## DISCUSSION

### *Summary*

Our quality improvement study successfully decreased the discrepancy in the LOS and TTP for low-acuity SSLEP patients, bringing those times into closer approximation

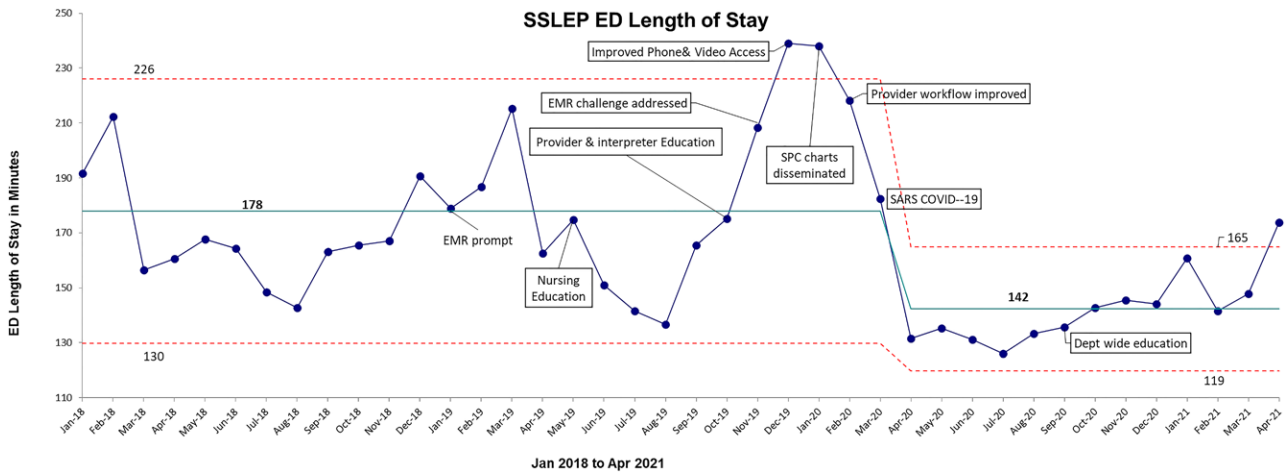


**Fig. 2.** LOS for SSLEP children.

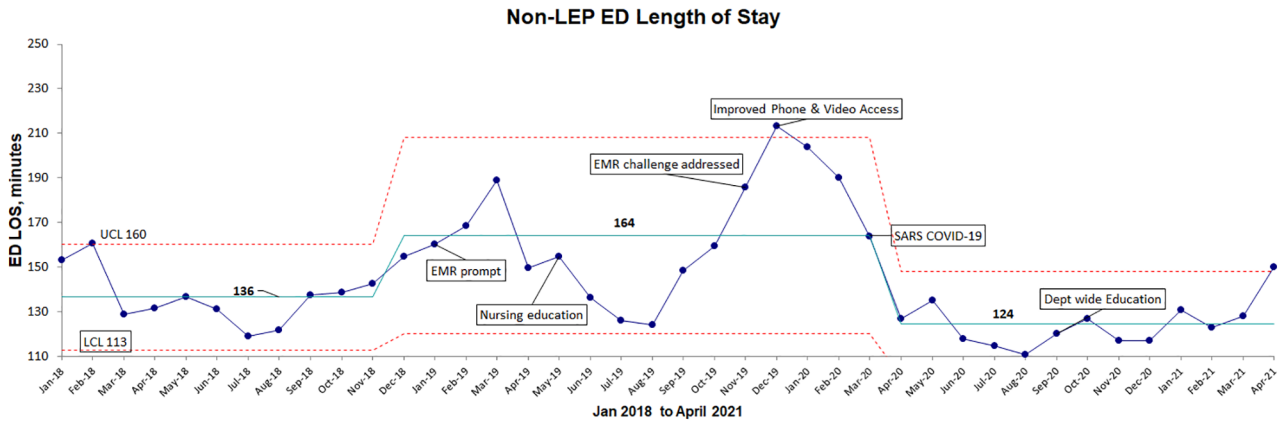


Fig. 3. LOS LEP.

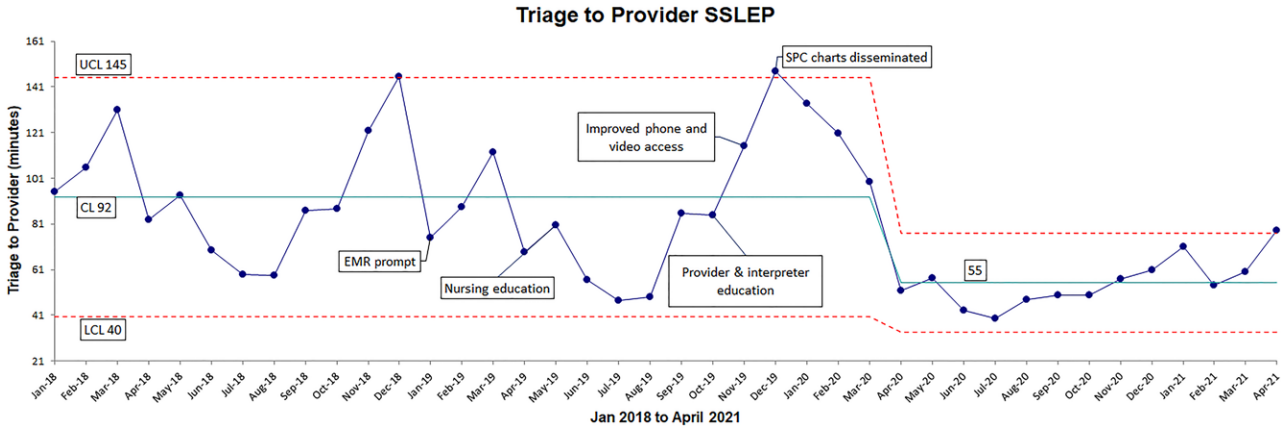


Fig. 4. TTP SSLEP.

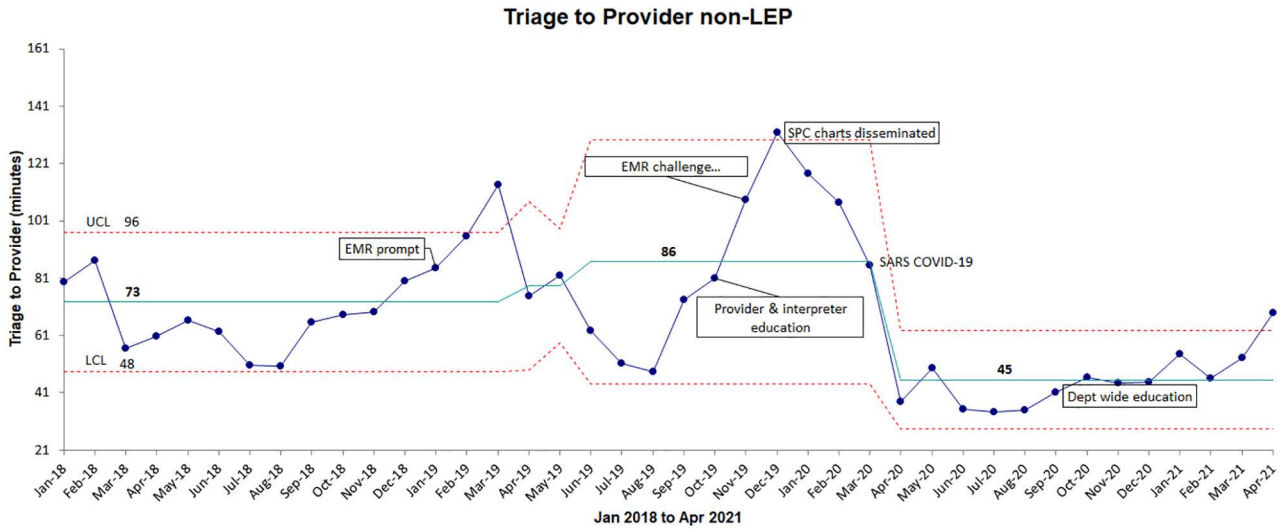


Fig. 5. TTP LEP.

with low-acuity, non-LEP LOSs, and TTPs. In addition, incorporating professional interpreters into the process as working group participants and front-line providers led to important insights and resources.

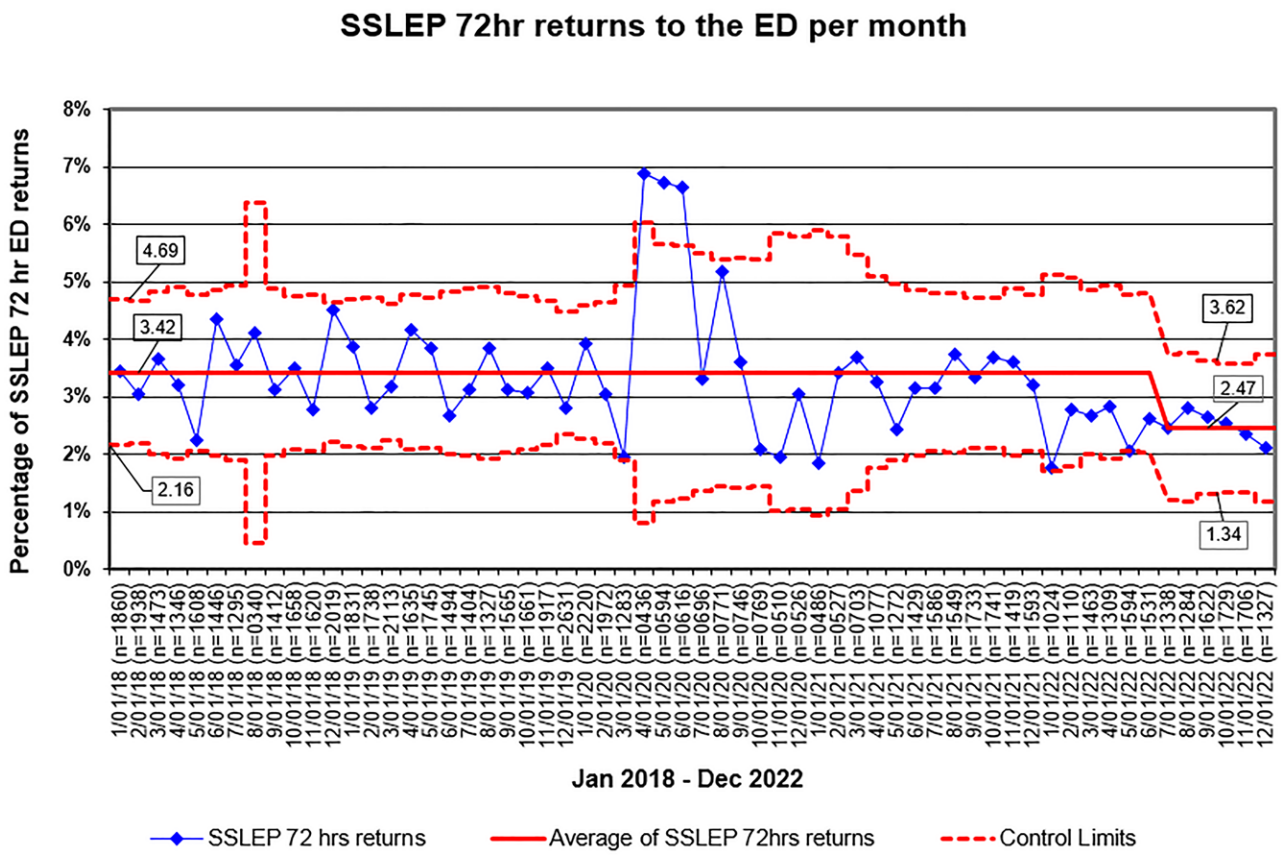


**Fig. 6.** SSLEP 72-hour revisit.

Previous studies have demonstrated the importance of medical interpreter services on patient satisfaction, quality of care, and outcomes.[5,6] Other studies have primarily focused on describing the problem, cost variation, testing, diagnosis, or adverse events' increase. Limited research exists on systems-level interventions to improve care delivery. Martinez et al described strategies to increase appropriate interpreter use and documentation.[4] To our knowledge, this is the first description delineating a practical approach to decrease LOS for SSLEP in a pediatric emergency setting. Improving the LOS translates into a better patient experience. Increased access to trained professional interpreters improves communication, patient satisfaction, adherence, and mortality.[13–16] We believe these strategies to address workflow barriers and optimally engage with interpretation services can be translated, with center-specific modifications, to other pediatric EDs. We did not find any negative impact on the non-LEP populations, nor in 72-hour revisits for LEP patients, suggesting our strategies do not negatively impact patient experience or safety.

Diamond et al reported that physicians use the "getting by" approach, that is, relying on their limited second language skills, family members, or gestures, because they believe engaging interpreters delays care delivery.[14] We hope this study demonstrates that calling an interpreter is not a trade-off with provider efficiency. In our study, providers reported increased interactions with interpreters, and the mean TTP for SSLEP patients improved by 36 minutes from baseline.

The methodological adjustment and sustaining the gain for a year after the intervention, even when patients returned, demonstrate that our results were not due to seasonal variation. Moreover, we demonstrated that the gap between SSLP and non-LEP narrowed. Following the metrics of non-LEP patients as a balancing measure further suggests that the decrease in LOS and TTP SSLEP families was secondary to the dedicated quality improvement intervention. Had a decrease in patient volume alone accounted for improved throughput, English-proficient patients should have experienced markedly decreased wait times, further exacerbating the gap between both populations.

Special degradation occurred in April 2021. Like many throughout the country, we suspect that our ED fundamentally changed after the respiratory viral surge accompanied by nursing and ancillary staff shortages. Processes were not in control.

### *Limitations*

We conducted this study at a tertiary care center with 3 modalities of interpreter services, which may not be available at all institutions. Second, we have access to EMR analysts capable of editing clinical decision support tools. These interventions may not be generalizable to all

institutions. We could not obtain metrics on time to an interpreter or type of interpreter utilized, both potential process measures. Third, the TTP mirrored the LOS and appeared to be the major factor accounting for the LOS. This finding is expected since components of the ED visit not under provider control (eg, imaging and laboratory analysis) contribute to the overall LOS but not the time from arrival to seeing a provider. Fourth, this study timeline included the SARS-COVID-19 pandemic. However, improvement in the mean LOS of SSLEP patients started 3 months before the first SARS-COVID-19 patient arrived at our hospital and continued a year after the interventions. We also adjusted the SPC charts for changes in ED patient volumes based on established QI methodology. Finally, we decreased but did not eliminate the disparity.

## CONCLUSIONS

We identified feasible interventions to improve wait times for children with caregivers with limited English proficiency. We believe these strategies to address workflow barriers and optimally engage with interpretation services can be translated, with center-specific modifications, to other pediatric EDs. Future directions include addressing disparities in all components of the entire ED visit to decrease the LOS discrepancies. We hope to extend our findings to benefit all LEP communities.

## DISCLOSURES

The authors have no financial interest to declare in relation to the content of this article.

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