

# Patterns and Predictors of Professional Interpreter Use in the Pediatric Emergency Department

K. Casey Lion, MD, MPH,<sup>a,b</sup> Jesse Gritton, MPH,<sup>b</sup> Jack Scannell, MB, BChir,<sup>b</sup> Julie C. Brown, MDCM, MPH,<sup>a,c</sup> Beth E. Ebel, MD, MSc, MPH,<sup>a,b,d</sup> Eileen J. Klein, MD, MPH,<sup>a,c</sup> Rita Mangione-Smith, MD, MPH<sup>a,b</sup>

abstract

**BACKGROUND AND OBJECTIVES:** Professional interpretation for patients with limited English proficiency remains underused. Understanding predictors of use is crucial for intervention. We sought to identify factors associated with professional interpreter use during pediatric emergency department (ED) visits.

**METHODS:** We video recorded ED visits for a subset of participants ( $n = 50$ ; 20% of the total sample) in a randomized trial of telephone versus video interpretation for Spanish-speaking limited English proficiency families. Medical communication events were coded for duration, health professional type, interpreter (none, ad hoc, or professional), and content. With communication event as the unit of analysis, associations between professional interpreter use and assigned interpreter modality, health professional type, and communication content were assessed with multivariate random-effects logistic regression, clustered on the patient.

**RESULTS:** We analyzed 312 communication events from 50 ED visits (28 telephone arm, 22 video arm). Professional interpretation was used for 36% of communications overall, most often for detailed histories (89%) and least often for procedures (11%) and medication administrations (8%). Speaker type, communication content, and duration were all significantly associated with professional interpreter use. Assignment to video interpretation was associated with significantly increased use of professional interpretation for communication with providers (adjusted odds ratio 2.7; 95% confidence interval: 1.1–7.0).

**CONCLUSIONS:** Professional interpreter use was inconsistent over the course of an ED visit, even for patients enrolled in an interpretation study. Assignment to video rather than telephone interpretation led to greater use of professional interpretation among physicians and nurse practitioners but not nurses and other staff.



<sup>a</sup>Department of Pediatrics and <sup>d</sup>Harborview Injury Prevention and Research Center, University of Washington, Seattle, Washington; and <sup>b</sup>Center for Child Health, Behavior and Development and <sup>c</sup>Center for Clinical and Translational Research, Seattle Children's Research Institute, Seattle, Washington

Dr Lion conceptualized and designed the study, oversaw data collection, participated in video coding, performed the analyses, and drafted the manuscript; Ms Gritton assisted with study design, participated in patient enrollment and data collection, participated in video coding, and reviewed and revised the manuscript; Dr Scannell drafted the video-coding codebook, participated in video coding, and reviewed and revised the manuscript; Drs Brown, Ebel, and Klein assisted with study design, participated in data interpretation, and reviewed and revised the manuscript; Dr Mangione-Smith participated in study design, contributed to analytic planning and interpretation of results, and critically revised the manuscript; and all authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

Deidentified individual participant data will not be made available.

**WHAT'S KNOWN ON THIS SUBJECT:** Professional interpreter use improves safety and quality of care for individuals with limited English proficiency, but use remains low in clinical settings. A better understanding of predictors of use is essential for crafting successful interventions.

**WHAT THIS STUDY ADDS:** Interpreter use was associated with speaker type, longer communications, and communication content, with particularly low use for high-risk activities like medication administration. Assignment to video rather than telephone interpretation led to greater professional interpreter use among providers but not nurses.

**To cite:** Lion KC, Gritton J, Scannell J, et al. Patterns and Predictors of Professional Interpreter Use in the Pediatric Emergency Department. *Pediatrics*. 2021; 147(2):e20193312

Effective communication is central to providing high-quality care, and differential communication based on patient and family characteristics is increasingly recognized as an important driver of health care disparities.<sup>1,2</sup> For the 25 million individuals in the United States with limited English proficiency (LEP),<sup>3</sup> professional medical interpretation has been repeatedly shown to improve quality of care and decrease disparities.<sup>4,5</sup> Nonetheless, professional interpretation remains underused, with fewer than half of health care encounters for LEP patients or families typically using it.<sup>6-10</sup> Persistent interpreter underuse creates and perpetuates disparities for this marginalized population.

Federal mandate requires that medical care be delivered in a language that is understood.<sup>11</sup> For actual interpreter use to occur, however, it is required that a health care professional identifies it is needed, decides to use it, and then successfully accesses the service. Important work is ongoing around how to best identify LEP individuals.<sup>7,12</sup> In most studies of decision-making around interpreter use, researchers rely on provider self-report, which is subject to social desirability bias; little is known about actual patterns of interpreter use for individual communications.<sup>13-17</sup>

Understanding the specific circumstances under which health care professionals choose to use an interpreter can help delineate the causal pathway by which interpreter use occurs (or fails to occur) and allows more tailored intervention strategies. In this study, we sought to characterize observed use of professional interpretation with LEP Spanish-speaking families in a pediatric emergency department (ED) on the basis of speaker type, communication content and duration, and method of interpretation (telephone versus video).

## METHODS

### Study Setting and Population

This study of observed communication behavior with Spanish-speaking LEP families was embedded within a larger randomized controlled trial (RCT) comparing telephone and video interpretation in a pediatric ED. In the larger study, described elsewhere, we enrolled 249 Spanish-speaking LEP patients in the ED.<sup>18</sup> After enrollment in the main study, parents were asked for permission to video record the encounter. For consenting families, a video camera was mounted in the room, and door signs stated that recording was occurring. Recording typically began partway through the visit.

Eligibility criteria for the main study and this substudy were the same. Eligible patients were <18 years of age and presented to the ED during recruitment hours with a family identified at triage as preferring Spanish for medical care between March and August 2014. Patients were ineligible if they had a life-threatening emergency<sup>19</sup>; if the presenting complaint was primarily behavioral, psychiatric, or social (eg, concern for abuse); or if a treating doctor or nurse practitioner (henceforth, provider) determined that in-person interpretation was needed.

### Random Assignment

Patients were randomly assigned to telephone or video interpretation by day, so there was a default interpretation modality to use with Spanish-speaking families randomly selected via sealed envelope each recruitment day. We used this approach because (to not delay patient care) study recruitment often happened partway through the visit after some communication had already occurred. Health care professionals were asked to use the default interpretation modality with

Spanish-speaking families until eligibility and participation could be assessed, unless in-person interpretation was required.

### Data Collection

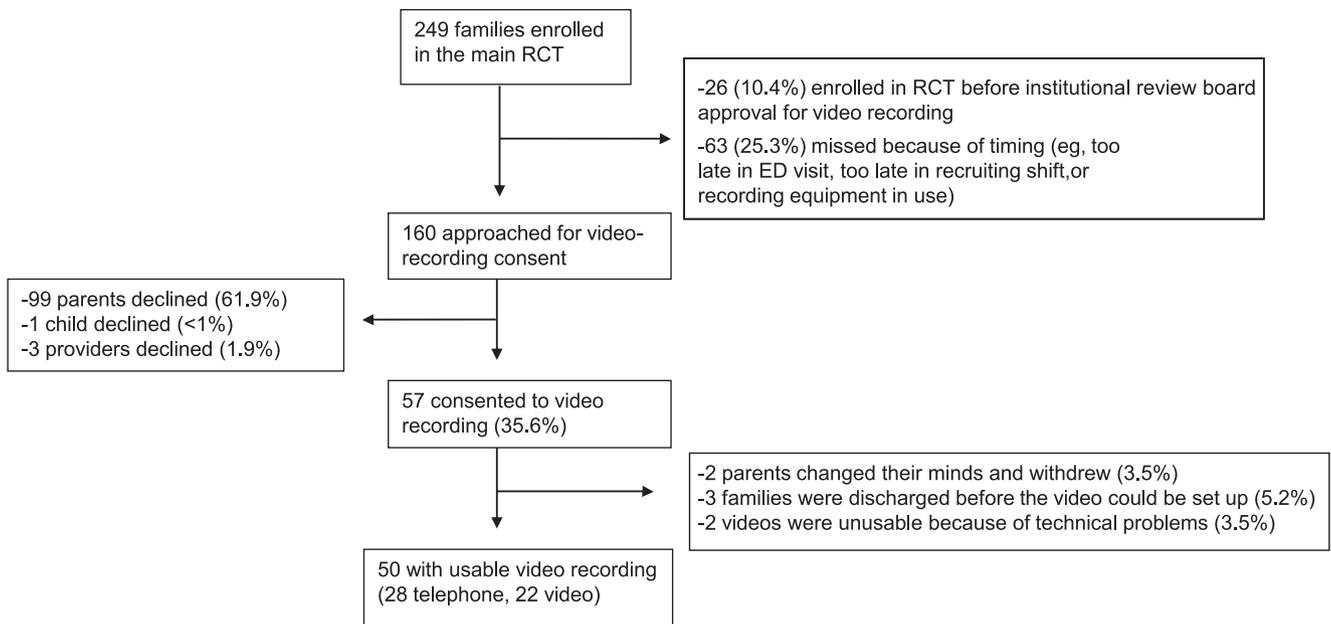
A bilingual research assistant called parents 2 to 7 days after the visit to complete a survey assessing communication outcomes<sup>18</sup> and family background information. Patient age, insurance type, sex, and medical complexity<sup>20,21</sup> were obtained from hospital administrative data. This study was approved by the Seattle Children's Hospital Institutional Review Board.

### Video Coding

Fifty videotaped encounters were reviewed and coded by at least 1 of 3 investigators (K.C.L., J.G., and J.S.). The coding scheme was developed with the first 5 videos and then refined with the subsequent 5. Questions were flagged and reviewed by other investigators. A random 10% sample of videos underwent double coding.  $\kappa$  statistics were calculated for interrater agreement, with values of 0.89 for method of communication, 0.92 for speaker type, and 0.72 to 1.00 for content categories described below.

### Communication Events

Each interaction between a health care professional and the patient or family was deemed a communication event if it included communication or would reasonably have done so if there were no language barrier (eg, checking vital signs). Interactions without medical staff present were excluded. Each communication event was coded for duration, speaker, content, and interpretation type. When the speakers or interpretation type changed, we considered the change to mark the beginning of a new communication event. For example, if a provider gathered the history in English and then switched to telephone interpretation to discuss the plan, we coded 2 separate events.



**FIGURE 1**  
CONSORT diagram of study enrollment.

### Times

For each communication event, start and stop times were recorded to calculate duration. For events involving telephone or video interpretation, we recorded interpretation delay time as the time between health care professional initiation of the connection to the interpreter and initiation of an interpreted conversation.

### Content

Coded communication content included history taking, plan explanation or discussion, medical updates (including assessing response to treatment), medication administration, procedures, vital signs, other medical interactions, or nonmedical interactions (eg, registration). Many communication events included multiple types of content, in which case all elements were recorded. Some events consisted of a physical examination without any other communication (generally performed by the attending physician); these were categorized separately. When an examination was performed in

conjunction with communication, the event was coded on the basis of the communication content.

### Speaker

The primary person speaking with the patient or family was classified as follows: attending ED physician, ED-based resident or nurse practitioner, consulting physician (eg, general surgeon), nurse, other clinical staff (eg, respiratory therapist), or nonmedical staff (eg, registrar). A change in the primary speaker was coded as a new communication event.

### Method of Communication or Interpretation

The method of communication or interpretation with LEP families was recorded for each communication event as follows: professional in-person interpreter, professional video interpreter, professional telephone interpreter, ad hoc interpreter (family member, friend, sibling, patient, 1 parent for the other, or noninterpreter staff member), and communication primarily in English, Spanish, or a mix of English and Spanish. Speakers recorded using Spanish were compared with the list of individuals

certified to use Spanish for medical discussions, as required by hospital policy; events conducted by certified speakers were reclassified as bilingual communications.

### Analysis

Communication events that were exclusively nonmedical were dropped from analysis. Bilingual communications by certified speakers were also dropped because no language barrier existed.

To assess our primary outcome, the communication method was grouped as using professional interpretation (in-person, telephone, or video interpreter) or communicating without professional interpretation (ad hoc interpreter, English, or Spanish by an uncertified speaker). Analyses were conducted in 2 ways: at the level of the patient ( $n = 50$ ) and at the level of the individual communication event ( $N = 312$ ). Descriptive statistics were compiled at both levels.

### Patient-Level Analyses

For patient-level analyses, we conducted unadjusted analysis

because this study was nested within an RCT, and we expected potential confounders to be evenly distributed between groups. At the patient level, we examined the percentage of communication time that was professionally interpreted, which was calculated as the communication event time with a professional interpreter divided by the total communication time (in seconds).

We tested for an association between assigned interpreter modality (telephone versus video using an intention-to-treat approach) and the percentage of communication using professional interpretation by using Student's *t* test, assuming unequal variance. We then repeated this analysis after restricting the communication events to providers (ie, doctors and nurse practitioners) because we hypothesized that providers might be more likely to use interpretation at baseline and so might be more sensitive to the assigned modality.

### Communication Event–Level Analyses

For communication event–level analyses, we used hierarchical multivariate random-effects logistic models, clustered on the individual patient. Use of this approach allowed the consideration of factors occurring at the level of the patient (eg, assigned modality) and the individual communication event (eg, health care professional type, communication content, and communication duration). We examined the adjusted odds of professional interpreter use for any communication event on the basis of assigned interpreter modality. We then created a similar model, stratified by speaker type (eg, provider versus nurse).

## RESULTS

### Participant Characteristics

Of 249 participants in the main RCT, 160 were approached for consent for video recording, of whom 57

**TABLE 1** Characteristics of Patients in the Main Trial and Video-Recording Substudy

	Enrolled in Overall Study, Not Recorded	Video Recorded	<i>P</i> <sup>a</sup>
<b>Patient and visit characteristics</b>			
	<i>n</i> = 198	<i>n</i> = 50	
Assigned to video interpreter, <i>n</i> (%)	119 (60)	22 (44)	.04
Boys, <i>n</i> (%)	101 (51)	34 (68)	.03
Age, y, mean (SD)	5.8 (4.3)	5.9 (4.8)	.91
Private insurance, <i>n</i> (%)	2 (1)	1 (2)	.92
PMCA category, <sup>b</sup> <i>n</i> (%)			.13
No chronic condition	21 (11)	7 (14)	
Noncomplex chronic condition	159 (80)	34 (68)	
Complex chronic condition	18 (9)	9 (18)	
Weekday visit, <i>n</i> (%)	166 (86)	39 (78)	.19
NEDOCS, <sup>c</sup> <i>n</i> (%)	62 (23)	59 (22)	.41
Triage score, <sup>d</sup> <i>n</i> (%)			.46
2	15 (8)	3 (6)	
3	96 (49)	26 (52)	
4	71 (36)	20 (40)	
5	16 (8)	1 (2)	
Admitted to hospital, <i>n</i> (%)	25 (13)	13 (26)	.02
At least 1 provider certified to speak Spanish, <i>n</i> (%)	26 (13)	5 (10)	.55
<b>Parent survey–based measures<sup>e</sup></b>			
	<i>n</i> = 163	<i>n</i> = 45	
Previous experience with current condition, <i>n</i> (%)	51 (32)	13 (30)	.71
Parent born in Mexico, <i>n</i> (%)	131 (82)	39 (87)	.45
Parent years in United States, mean (SD)	11.5 (5)	11.2 (5)	.71
English proficiency, <i>n</i> (%)			.68
Well or very well	22 (14)	7 (16)	
Not well	99 (62)	24 (55)	
Not at all	39 (24)	13 (30)	
Parent education, <i>n</i> (%)			.55
Below or including eighth grade	62 (39)	19 (42)	
Some high school	48 (30)	9 (20)	
High school diploma or GED	32 (20)	12 (27)	
Some college or more	16 (10)	5 (11)	
Parent income, <i>n</i> (%)			.22
<\$15 000	39 (24)	8 (18)	
\$15–30 000	62 (38)	25 (56)	
>\$30 000	36 (22)	7 (16)	
Unknown and/or declined	26 (16)	5 (11)	
Parent report of any lapse in professional interpreter use, <i>n</i> (%)	104 (63)	27 (60)	.64

GED, general equivalency diploma; NEDOCS, National Emergency Department Overcrowding Score; PMCA, Pediatric Medical Complexity Algorithm.

<sup>a</sup>  $\chi^2$ .

<sup>b</sup> PMCA is used to determine child medical complexity on the basis of  $\leq 3$  years' worth of diagnosis codes.

<sup>c</sup> NEDOCS score indicates ED crowding relative to staff and rooms available and was recorded at the time of family enrollment in the study.

<sup>d</sup> Triage level assigned in ED to indicate illness severity. Patients with triage level of 1 (highest acuity) were not eligible to participate.

<sup>e</sup> For these measures collected during the follow-up survey, the denominators were 163 for non–video-recorded participants and 45 for video-recorded participants.

consented (35.6%), yielding 50 videos that captured at least 1 medical communication (see Fig 1). Patients who were video recorded resembled those in the main study, with the exception of being more often assigned to telephone interpretation, more often boys, and more frequently admitted to the

hospital (Table 1). Participating parents were similar to those in the main study, with >80% reporting speaking English not well or not at all and >60% with less than a high school degree. Participant characteristics were evenly balanced between study arms, except that more parents assigned to telephone,

compared to video, reported previous experience with the child's current medical condition (42% telephone arm versus 11% video arm;  $P = .03$ ).

### Communication Event Characteristics

On average, using video recording, we captured 6.4 discrete medical communications with telephone-assigned families and 6.0 discrete communications with video-assigned families, yielding 312 medical communications across the 50 families (Table 2). Professional interpreter use was captured on video at least once for 86% and 95% of families assigned to telephone and video, respectively.

Among individual communication events, over half of medical communications were conducted in English (51% for telephone arm and 56% for video arm), and about one-third were conducted with the assigned interpreter modality (36% for telephone and 33% for video).

**TABLE 2** Medical Communication Events Characteristics, by Study Arm

	Telephone	Video	<i>P</i>
At patient level	<i>n</i> = 28	<i>n</i> = 22	
No. of video-recorded medical communications per patient, mean (SD)	6.4 (3.8)	6.0 (7.8)	.80 <sup>a</sup>
Total communication time per patient, min, mean (SD)	44.9 (37.8)	34.7 (47.8)	.42 <sup>a</sup>
Professional interpretation use captured at least once on video, <i>n</i> (%)	24 (86)	21 (95)	.25 <sup>b</sup>
At communication event level	<i>n</i> = 180	<i>n</i> = 132	
Duration of communication events, min, mean (SD)			
Provider-led communication	7.5 (7.3) ( <i>n</i> = 110)	5.5 (5.3) ( <i>n</i> = 68)	.05 <sup>a</sup>
Nurse-led communication	6.2 (5.2) ( <i>n</i> = 66)	6.2 (8.6) ( <i>n</i> = 62)	.97 <sup>a</sup>
Interpretation start-up time, min, mean (SD)	2.1 (0.9) ( <i>n</i> = 55)	1.0 (0.8) ( <i>n</i> = 38)	<.001 <sup>a</sup>
Individually evaluated communication event part of longer communication, <i>n</i> (%)	58 (32)	36 (27%)	.34 <sup>b</sup>
Communication method, <i>n</i> (%)			<.001 <sup>c</sup>
Primarily English	92 (51)	74 (56)	
Primarily Spanish, not certified	9 (5)	6 (5)	
Mixed English and Spanish	6 (3)	4 (3)	
Ad hoc interpreter	6 (3)	2 (2)	
In-person interpreter	2 (1)	2 (2)	
Telephone interpreter	64 (36)	1 (1)	
Video interpreter	1 (1)	43 (33)	

<sup>a</sup> Student's *t* test, assuming unequal variance.

<sup>b</sup>  $\chi^2$ .

<sup>c</sup> Fisher's exact test.

**TABLE 3** Percentage of Communication Time Using Professional Interpretation per Patient, by Assigned Study Arm

	Telephone ( <i>n</i> = 28)	Video ( <i>n</i> = 22)	<i>P</i> <sup>a</sup>
Overall			
Percentage of communication time interpreted, mean (95% CI)	41 (32–50)	50 (41–60)	.16
Restricted to provider-led communication			
Percentage of communication time interpreted, mean (95% CI)	52 (42–62)	64 (54–74)	.08

<sup>a</sup> Student's *t* test, assuming unequal variance.

Thirty percent of individual communications were part of a longer communication, with a switch in primary speaker (eg, resident to attending) or communication method (eg, starting with an interpreter then disconnecting and finishing in English). Each part of the longer communication had to contain medical information to be counted as a discrete communication event.

### Interpretation Initiation Delay

Interpretation initiation delay, defined as the time from when a health care professional started the process to connect to a telephone or

video interpreter (eg, by dialing the phone number or tapping the video icon) to when they were able to start communicating with the parent, was more than twice as long for telephone compared to video interpretation (mean, 2.1 minutes for telephone versus 1.0 minute for video;  $P < .001$ ).

### Use of Professional Interpretation Over Patient Encounters

Although most LEP families received professional interpretation during their visit, in a more granular analysis, we found professional interpretation was used for half of the total medical communication time (41% for telephone arm and 50% for video arm;  $P = .16$ ; Table 3). In unadjusted analysis, during communication with providers, 52% of communication time was interpreted in the telephone arm, and 64% was interpreted in the video arm ( $P = .08$ ).

### Predictors of Interpreter Use at the Communication Event Level

Overall, professional interpretation was used more often during communication events with providers compared to those with nurses (51% vs 16%;  $P < .001$ ) and for detailed histories (89%) and explaining the plan (60%) compared to procedures (11%) or medication administration (8%;  $P < .001$ ; Table 4). In multivariate hierarchical models, we found no overall association between assigned study arm and odds of professional interpreter use (Table 5). However, among provider-led communication events,

**TABLE 4** Use of Professional Interpretation by Communication Event Characteristic

Event Characteristic	Used Professional Interpretation, <i>n</i> of <i>N</i> (%)	<i>P</i> <sup>a</sup>
Overall	113 of 312 (36)	
Health professional		<.001
Attending	24 of 51 (47)	
Consultant	13 of 32 (41)	
Resident or nurse practitioner	54 of 95 (57)	
Nurse	20 of 128 (16)	
Tech or other	2 of 6 (33)	
Content		<.001
Detailed history	24 of 27 (89)	
Update and/or check-in	19 of 53 (36)	
Medication administration	2 of 26 (8)	
Vitals	3 of 36 (8)	
Examination only	2 of 36 (6)	
Procedure	4 of 35 (11)	
Explanation and/or plan	59 of 99 (60)	
Length of communication <sup>b</sup>		<.001
0–122 s (0–2 min)	2 of 79 (3)	
123–292 s (2–4.9 min)	24 of 77 (31)	
293–514 s (4.9–8.6 min)	39 of 78 (50)	
>514 s (>8.6 min)	48 of 78 (62)	

<sup>a</sup> Based on Fisher's exact test.

<sup>b</sup> Divided into quartiles.

assignment to video interpretation was associated with a 2.7-fold increased odds of professional interpreter use, after controlling for communication content, duration, and provider role (95% confidence interval [CI]: 1.1–7.0). There was no association between assigned modality and interpreter use among nurses.

## DISCUSSION

In this study of Spanish-speaking LEP families seeking emergency care, professional interpretation was used at least once for most visits. Nevertheless, over half of medical communication minutes occurred without professional interpretation. Interpreter use was particularly low for high-risk activities like medication administration and procedures. Professional interpretation was more often used by providers, compared with nurses, and for longer communications and those involving history taking or education. After controlling for role, communication content, and duration, providers whose patients were assigned to video interpretation had an almost threefold increased odds of using

professional interpretation for any communication compared with patients who were assigned to telephone. There was no association between assigned interpreter modality and interpreter use among nurses or in the overall sample, including medical communication by nurses, providers, and other staff.

Most LEP families in our study received some professional interpretation (96%), which compares favorably to studies revealing professional interpretation in less than one-third to one-half of LEP patient encounters.<sup>8,10,22,23</sup> We found lower rates of ad hoc interpreter use than what has been found in many previous studies,<sup>6,9</sup> reflective of a decade of institutional commitment to improving professional interpreter use.<sup>24–26</sup> However, in more granular analysis, we found that over half of medical communication still occurred without professional interpretation despite readily accessible services. These findings are striking for 2 reasons. First, all health care professionals knew they were being video recorded for a study about interpreter use, so

typical use may be even lower than what we found. Second, some interpreter use was observed for nearly all participants. In most studies, interpreter use is classified as a dichotomous exposure (ie, any interpreter use in the visit), so these encounters would have been counted as using professional interpretation when most included substantial medical communication without it. This suggests that, at least when considering remote methods of interpretation (in which a new connection to an interpreter must be established for each communication event), even patients classified as receiving interpretation may not have received it for important discussions.

Our findings of variability in interpreter use based on communication content and duration are consistent with results from previous studies of provider decision-making around interpretation.<sup>13–16</sup> Providers are less likely to use interpretation for discussing things they hope will be straightforward<sup>17</sup> or if they believe a patient or parent understands them, regardless of stated preference for interpretation.<sup>13,27</sup> Time constraints and perceived benefits factor into decision-making so that providers may forgo interpretation for anticipated short communications or updates.<sup>13–15</sup> Variable interpreter use over the course of a single ED visit suggests a new decision about use is made for each communication event rather than a decision being made about a family for the entire visit. This finding has important implications for intervention because barriers to timely interpreter access are repeatedly weighed against perceived benefit and hassle.

The association between interpreter use and speaker role is a novel finding. After controlling for communication content, we found that nurses and consulting physicians (ie, not ED-based) had significantly lower odds of interpreter use

**TABLE 5** Multivariate Hierarchical Logistic Regression of Factors Associated With Use of Professional Interpretation at the Level of Individual Communication Events

	Among All Communications (N = 312)		Provider Communications (n = 178) <sup>a</sup>		Nurse Communications (n = 106) <sup>a</sup>	
	Odds Ratio (95% CI)	P	Odds Ratio (95% CI)	P	Odds Ratio (95% CI)	P
Study arm						
Telephone	Referent group	—	Referent group	—	Referent group	—
Video	1.15 (0.55–2.42)	.71	2.7 (1.1–7.0)	.04	0.72 (0.14–3.81)	.70
Health professional						
ED attending	Referent group	—	Referent group	—	—	—
Consulting doctor	0.19 (0.05–0.76)	.02	0.18 (0.04–0.78)	.02	—	—
ED resident or nurse practitioner	0.79 (0.29–2.09)	.63	0.88 (0.31–2.5)	.81	—	—
Nurse	0.28 (0.10–0.83)	.02	—	—	—	—
Techs or other	1.22 (0.11–13.75)	.87	—	—	—	—
Content						
Update or check-in	Referent group	—	Referent group	—	Referent group	—
Procedure	0.02 (0.002–0.16)	<.001	0.03 (0.003–0.44)	.01	— <sup>b</sup>	—
Vitals	0.17 (0.04–0.77)	.02	—	—	0.15 (0.02–1.06)	.06
Examination only	0.05 (0.01–0.29)	.001	0.04 (0.006, 0.26)	.001	—	—
Detailed history	4.88 (0.92–25.80)	.06	2.0 (0.29–13.3)	.49	—	—
Explanation or plan	1.81 (0.80–4.09)	.15	1.1 (0.36–3.2)	.89	3.64 (0.66–19.97)	.14
Medication admin	0.05 (0.01–0.53)	.01	—	—	0.11 (0.01–1.51)	.10
Total communication time, s	1.003 (1.002–1.004)	<.001	1.006 (1.004–1.009)	<.001	1.002 (1.000–1.004)	.03

Controlling for all listed variables, clustered by patient. —, not applicable.

<sup>a</sup> The number of provider-plus-nurse communication event totals do not equal the overall total because medical communications by nurse techs and others were included in the total but not the subgroups.

<sup>b</sup> No odds ratio was calculated for this predictor because there was no professional interpreter use by nurses while performing a procedure, so all observations in this category equaled 0.

compared with those of ED-based physicians and nurse practitioners. Potential explanations include less familiarity with interpreter access in the ED or lower importance being placed on information exchange by those individuals. For example, consulting physicians may rely on history documented by ED providers, and nurses may view their primary job as task-oriented (eg, vitals and medication administration) rather than communication-oriented. This latter hypothesis is consistent with the pattern of interpreter use by communication content, in which interpreter use was most frequent when the health care professional needed something from the family (eg, detailed history) and least frequent when the health care professional wished to accomplish a task (eg, administering medications). Unfortunately, these patterns led to infrequent interpreter use for medication administration

and procedures, 2 high-risk activities in which a parent's ability to ask questions and seek clarification may prevent serious medical errors and patient harm. Examples could include a parent's ability to intervene before a child is given a medication they are allergic to or before a peripheral intravenous line is placed near an arteriovenous fistula used for hemodialysis access.

Assignment to video interpretation was associated with increased professional interpreter use among providers. These observed results are consistent with parent-reported findings from the main RCT's survey, in which parents assigned to video were less likely to report frequent lapses in interpreter use,<sup>18</sup> and provide objective evidence of greater interpreter use when video was available. Health care professionals and LEP parents have been found to prefer video over telephone

interpretation.<sup>28,29</sup> Increasing video interpreter availability, in places where telephone interpretation has been the norm, may increase the use of professional interpretation and improve communication with families.<sup>30</sup> In addition, the start-up delay for telephone interpretation was twice as long as for video. Given that health care professionals are deciding whether to use interpretation before every communication event, even small additional barriers can amount to important decreases in use. Efforts to improve interpreter use should prioritize making access as quick and easy as possible.

This study had several limitations. We enrolled families at a single institution with excellent interpreter services, so results may not be generalizable. We had low enrollment from the overall RCT; families who agreed to video recording may differ from those who declined, although the video-recorded group appeared similar to the overall study group on assessed measures. Captured provider behavior was also likely affected by the overall study design: awareness of recording likely improved interpreter use, whereas assignment to a particular method may have dampened it. Nonetheless, because assignment to a particular modality was not enforced, health care professionals retained discretion as to how they would communicate with each family (with only about one-third of providers using the assigned modality during communication events, as detailed in Table 2), producing results that shed new light on how interpreter use decisions are made in practice. Additionally, patterns of remote interpreter use, in which a new connection must be established for each communication, may not reflect patterns for in-person interpreter use, in which that may not be the case. Video recording was generally initiated part way through the visit,

often missing the initial history, when interpreter use was highest. Finally, participants were not blinded to study objectives or video recording, so results may reflect a best-case scenario of interpreter use.

## CONCLUSIONS

In this study of video-recorded pediatric ED visits with Spanish-speaking LEP parents, we found low rates of professional interpreter use over the course of the ED visit. Interpretation was used infrequently by nurses and consulting physicians and for communication that was not part of the initial history or discussion of the treatment plan. We found particularly low interpreter use for high-risk activities, such as

medication administration and procedures.

Providers assigned to use video interpretation, rather than telephone, had significantly greater odds of professional interpreter use for medical communication. Additional interventions will be needed to address low use for high-risk activities that are not traditionally thought of as communication but which are likely made safer with communication. Efforts to change the culture around interpreter use, to focus on ensuring that patients and parents can communicate throughout the encounter, rather than only when a provider feels it is needed, will be essential for creating a safer and more equitable health care system.

## ACKNOWLEDGMENT

We thank Juan Kraus (1958–2019) for his invaluable contributions to this study and for his tireless work to improve language access and care for LEP families locally, regionally, and nationally. He was the ever-present, unassuming force that made this study, and many others, possible, and he will be greatly missed.

## ABBREVIATIONS

CI: confidence interval  
ED: emergency department  
LEP: limited English proficiency  
RCT: randomized controlled trial

---

This trial has been registered at [www.clinicaltrials.gov](http://www.clinicaltrials.gov) (identifier NCT01986179).

Ms Gritton's current affiliation is WithinReach Washington, Seattle, WA.

Dr Scannell's current affiliation is Royal London Hospital, London, England.

Dr Mangione-Smith's current affiliation is Kaiser Permanente Washington Health Research Institute, Seattle, WA.

**DOI:** <https://doi.org/10.1542/peds.2019-3312>

Accepted for publication Oct 26, 2020

Address correspondence to K. Casey Lion, MD, MPH, Center for Child Health, Behavior and Development, Seattle Children's Research Institute and University of Washington, M/S CURE-3 PO Box 5371, Seattle, WA 98145-5005. E-mail: [casey.lion@seattlechildrens.org](mailto:casey.lion@seattlechildrens.org)

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2021 by the American Academy of Pediatrics

**FINANCIAL DISCLOSURE:** The authors have indicated they have no financial relationships relevant to this article to disclose.

**FUNDING:** Funded by the Center for Child Health, Behavior, and Development at the Seattle Children's Research Institute and by the Center for Diversity and Health Equity at Seattle Children's Hospital. Dr Lion (principal investigator) was supported by the National Institute of Child Health and Human Development grant K23 HD078507. In-kind support was provided by the Seattle Children's Hospital Department of Interpreter Services and the Emergency Department research team. The funders had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the article; and decision to submit the article for publication. Funded by the National Institutes of Health (NIH).

**POTENTIAL CONFLICT OF INTEREST:** The authors have indicated they have no potential conflicts of interest to disclose.

---

## REFERENCES

1. Pérez-Stable EJ, El-Toukhy S. Communicating with diverse patients: how patient and clinician factors affect disparities. *Patient Educ Couns*. 2018; 101(12):2186–2194
2. Stewart MA. Effective physician-patient communication and health outcomes: a review. *CMAJ*. 1995;152(9): 1423–1433
3. US Census Bureau. Detailed languages spoken at home and ability to speak English for the population 5 years and over: 2009-2013. 2015. Available at: <https://www.census.gov/data/tables/2013/demo/2009-2013-lang-tables.html>. Accessed June 24, 2019
4. Karliner LS, Jacobs EA, Chen AH, Mutha S. Do professional interpreters improve clinical care for patients with limited English proficiency? A systematic review of the literature. *Health Serv Res*. 2007;42(2):727–754
5. Flores G. The impact of medical interpreter services on the quality of health care: a systematic review. *Med Care Res Rev*. 2005;62(3): 255–299

6. DeCamp LR, Kuo DZ, Flores G, O'Connor K, Minkovitz CS. Changes in language services use by US pediatricians. *Pediatrics*. 2013;132(2). Available at: [www.pediatrics.org/cgi/content/full/132/2/e396](http://www.pediatrics.org/cgi/content/full/132/2/e396)
7. Taira BR, Kim K, Mody N. Hospital and health system-level interventions to improve care for limited English proficiency patients: a systematic review. *Jt Comm J Qual Patient Saf*. 2019;45(6):446–458
8. Ramirez D, Engel KG, Tang TS. Language interpreter utilization in the emergency department setting: a clinical review. *J Health Care Poor Underserved*. 2008; 19(2):352–362
9. Ginde AA, Clark S, Camargo CA Jr.. Language barriers among patients in Boston emergency departments: use of medical interpreters after passage of interpreter legislation. *J Immigr Minor Health*. 2009;11(6):527–530
10. Ginde AA, Sullivan AF, Corel B, Caceres JA, Camargo CA Jr.. Reevaluation of the effect of mandatory interpreter legislation on use of professional interpreters for ED patients with language barriers. *Patient Educ Couns*. 2010;81(2):204–206
11. US Department of Health and Human Services Office of Minority Health. *National Standards for Culturally and Linguistically Appropriate Services in Health Care*. Rockville, MD: US Department of Health and Human Services Office of Minority Health; 2001
12. Karliner LS, Napoles-Springer AM, Schillinger D, Bibbins-Domingo K, Pérez-Stable EJ. Identification of limited English proficient patients in clinical care. *J Gen Intern Med*. 2008;23(10): 1555–1560
13. Diamond LC, Schenker Y, Curry L, Bradley EH, Fernandez A. Getting by: underuse of interpreters by resident physicians. *J Gen Intern Med*. 2009; 24(2):256–262
14. Hsieh E. Not just “getting by”: factors influencing providers’ choice of interpreters. *J Gen Intern Med*. 2015; 30(1):75–82
15. Andres E, Wynia M, Regeinstein M, Maul L. Should I call an interpreter?—How do physicians with second language skills decide? *J Health Care Poor Underserved*. 2013;24(2):525–539
16. Choe AY, Unaka NI, Schondelmeyer AC, Bignall WJR, Vilvens HL, Thomson JE. Inpatient communication barriers and drivers when caring for limited English proficiency children. *J Hosp Med*. 2019; 14(10):607–613
17. Lion KC, Thompson DA, Cowden JD, et al. Clinical Spanish use and language proficiency testing among pediatric residents. *Acad Med*. 2013;88(10): 1478–1484
18. Lion KC, Brown JC, Ebel BE, et al. Effect of telephone vs video interpretation on parent comprehension, communication, and utilization in the pediatric emergency department: a randomized clinical trial. *JAMA Pediatr*. 2015; 169(12):1117–1125
19. Wuerz RC, Travers D, Gilboy N, Eitel DR, Rosenau A, Yazhari R. Implementation and refinement of the emergency severity index. *Acad Emerg Med*. 2001; 8(2):170–176
20. Simon TD, Cawthon ML, Stanford S, et al; Center of Excellence on Quality of Care Measures for Children with Complex Needs Medical Complexity Working Group. Pediatric Medical Complexity Algorithm: a new method to stratify children by medical complexity. *Pediatrics*. 2014;133(6). Available at: [www.pediatrics.org/cgi/content/full/133/6/e1647](http://www.pediatrics.org/cgi/content/full/133/6/e1647)
21. Simon TD, Cawthon ML, Popalisky J, Mangione-Smith R; Center of Excellence on Quality of Care Measures for Children with Complex Needs. Development and validation of the Pediatric Medical Complexity Algorithm (PMCA) version 2.0. *Hosp Pediatr*. 2017; 7(7):373–377
22. Schenker Y, Pérez-Stable EJ, Nickleach D, Karliner LS. Patterns of interpreter use for hospitalized patients with limited English proficiency. *J Gen Intern Med*. 2011;26(7):712–717
23. Lee JS, Pérez-Stable EJ, Gregorich SE, et al. Increased access to professional interpreters in the hospital improves informed consent for patients with limited English proficiency. *J Gen Intern Med*. 2017;32(8):863–870
24. Lion KC, Ebel BE, Rafton S, Zhou C, Hencz P, Mangione-Smith R. Evaluation of a quality improvement intervention to increase use of telephonic interpretation. *Pediatrics*. 2015;135(3). Available at: [www.pediatrics.org/cgi/content/full/135/3/e709](http://www.pediatrics.org/cgi/content/full/135/3/e709)
25. Lion KC, Thompson DA, Cowden JD, et al. Impact of language proficiency testing on provider use of Spanish for clinical care. *Pediatrics*. 2012;130(1). Available at: [www.pediatrics.org/cgi/content/full/130/1/e80](http://www.pediatrics.org/cgi/content/full/130/1/e80)
26. Boscolo-Hightower A, Rafton SA, Tolman M, Zhou C, Ebel BE. Identifying families with limited English proficiency using a capture-recapture approach. *Hosp Pediatr*. 2014;4(1):16–22
27. Zun LS, Sadoun T, Downey L. English-language competency of self-declared English-speaking Hispanic patients using written tests of health literacy. *J Natl Med Assoc*. 2006;98(6):912–917
28. Anttila A, Rappaport DI, Tijerino J, Zaman N, Sharif I. Interpretation modalities used on family-centered rounds: perspectives of Spanish-speaking families. *Hosp Pediatr*. 2017; 7(8):492–498
29. Locatis C, Williamson D, Gould-Kabler C, et al. Comparing in-person, video, and telephonic medical interpretation. *J Gen Intern Med*. 2010;25(4):345–350
30. Marshall LC, Zaki A, Duarte M, et al. Promoting effective communication with limited English proficient families: implementation of video remote interpreting as part of a comprehensive language services program in a children’s hospital. *Jt Comm J Qual Patient Saf*. 2019;45(7): 509–516

## Patterns and Predictors of Professional Interpreter Use in the Pediatric Emergency Department

K. Casey Lion, Jesse Gritton, Jack Scannell, Julie C. Brown, Beth E. Ebel, Eileen J. Klein and Rita Mangione-Smith

*Pediatrics* 2021;147;

DOI: 10.1542/peds.2019-3312 originally published online January 19, 2021;

<b>Updated Information &amp; Services</b>	including high resolution figures, can be found at: <a href="http://pediatrics.aappublications.org/content/147/2/e20193312">http://pediatrics.aappublications.org/content/147/2/e20193312</a>
<b>References</b>	This article cites 24 articles, 4 of which you can access for free at: <a href="http://pediatrics.aappublications.org/content/147/2/e20193312#BIBL">http://pediatrics.aappublications.org/content/147/2/e20193312#BIBL</a>
<b>Subspecialty Collections</b>	This article, along with others on similar topics, appears in the following collection(s): <b>Administration/Practice Management</b> <a href="http://www.aappublications.org/cgi/collection/administration:practice_management_sub">http://www.aappublications.org/cgi/collection/administration:practice_management_sub</a> <b>Interpersonal &amp; Communication Skills</b> <a href="http://www.aappublications.org/cgi/collection/interpersonal_-_communication_skills_sub">http://www.aappublications.org/cgi/collection/interpersonal_-_communication_skills_sub</a>
<b>Permissions &amp; Licensing</b>	Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: <a href="http://www.aappublications.org/site/misc/Permissions.xhtml">http://www.aappublications.org/site/misc/Permissions.xhtml</a>
<b>Reprints</b>	Information about ordering reprints can be found online: <a href="http://www.aappublications.org/site/misc/reprints.xhtml">http://www.aappublications.org/site/misc/reprints.xhtml</a>

# American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®



# PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

## **Patterns and Predictors of Professional Interpreter Use in the Pediatric Emergency Department**

K. Casey Lion, Jesse Gritton, Jack Scannell, Julie C. Brown, Beth E. Ebel, Eileen J.  
Klein and Rita Mangione-Smith

*Pediatrics* 2021;147;

DOI: 10.1542/peds.2019-3312 originally published online January 19, 2021;

The online version of this article, along with updated information and services, is  
located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/147/2/e20193312>

Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 345 Park Avenue, Itasca, Illinois, 60143. Copyright © 2021 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 1073-0397.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®

