

# **Development and Validation of Oral and Written Examinations for Medical Interpreter Certification**

## **Technical Report**

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**PSI Services LLC**

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PSI project staff included John Weiner, Project Director; Mary Gevorkian, Project Manager; and Monica Freed, Project Consultant.

## Executive Summary

This report describes the methodology employed by Language Line University (LLU), an affiliate of Language Line Services, the International Medical Interpreters Association (IMIA), and PSI Services LLC (PSI) to construct an oral and written examination for medical interpreter certification. The resulting examination characteristics are also described. The report provides evidence of psychometric quality and validity in accordance with the *Standards for Educational and Psychological Testing* (AERA, APA, NCME, 1999). The process included a national job analysis, creating examination specifications, development of test items, and pilot testing and psychometric analysis, and assembly of equivalent test forms.

**Job Analysis.** The examinations were founded upon a national job analysis conducted by PSI and LLS in January 2009. The job analysis study used a multiple-method approach, incorporating expert judgments of an advisory committee, focus groups with participants from across the country, and a national survey of practicing professionals. The advisory committee was comprised of 44 experienced medical interpreting professionals representing every region of the United States, including active medical interpreters, medical interpreting program managers, and medical interpreter trainers and advocates for healthcare interpreting. An expert committee defined professional activities and knowledge requirements to be included in a job analysis survey and the survey was administered online to a national sample of practicing professionals. It was completed by 1,506 respondents, who were representative of the population of the medical interpreting profession.

**Examination Specifications.** PSI conducted statistical analyses of the responses to the job analysis survey to determine which of the professional activities and knowledge statements qualified for testing on the medical interpreter certification exam. LLS convened an expert panel to review the survey results and confirm the qualifying activities and knowledge statements to be represented in the examination content. Utilizing a template and process provided by PSI, the panel developed examination content specifications from the job analysis data through a combination of empirical and rational methods and provided their recommendations. Content specifications were developed for the both the oral and written exams.

**Test Item Development and Review.** In accordance with PSI's guidance and training, LLS convened a panel of experts to write, review and formally evaluate test items measuring sight translation and consecutive interpreting skills. Furthermore, IMIA and PSI convened a panel of experts to write, review and formally evaluate written exam items, upon reviewing and confirming previously developed content specifications. Following a rigorous training process on test item writing and standard setting, each panel of experts began the test item writing process, based on the test specifications established by the job analysis. Subject Matter Experts (SMEs) evaluated each item with respect to relevance to occupational requirements and the need for competence upon certification; and estimated difficulty for practicing professional interpreters.

**Standard Setting.** A recommended minimum passing score (cut score) was established through a standard setting study for each of the oral and written exams. Subject matter experts rated each item using a modified Angoff procedure. PSI staff then conducted analyses of the resulting item bank to derive a recommended cut score for the oral and written exams, designed to ensure safe and competent practice as a medical interpreter.

**Test Form Construction.** The oral test forms were pilot tested with 300 interpreters and the written test forms were pilot tested with 257 interpreters. Statistical analyses were conducted of the test responses to ensure that the test items had acceptable psychometric properties and to assemble statistically equivalent alternate exam forms. For the oral examination, final test forms were assembled based on the examination specifications above as well as the statistical analysis from the pilot test data, resulting in three equivalent forms. For the written exam, equivalent alternate forms were assembled to meet the test specifications using PSI's proprietary automated test generation system called FormCast™.

Overall, this report presents strong evidence for the psychometric quality and validity of the oral and written examinations for medical interpreter certification through a combination of a nationally representative occupational analysis survey and expert panels, expert-developed test items, pilot testing and statistical analysis, and professionally sound test form assembly.

## Introduction

This document describes the methodology used to develop and validate oral and written examinations for medical interpreter certification. The overarching aim was to ensure that the exams measure the most current knowledge and skills considered essential to a certified medical interpreter's performance of services in a manner that ensures patient safety. The present validation study was conducted by PSI Services LLC (PSI), Language Line University (LLU), and International Medical Interpreters Association (IMIA) between December 2008 and December 2009.

For the current initiative, a content validation strategy was utilized, consisting of several key steps, including: (1) job analysis; (2) test content specification; (3) test development, including item evaluation, classification, item development, and pilot testing; (4) standard setting; and (5) assembly of equivalent test forms. These steps combine to provide validity evidence that supports the inference that those who pass the national certification oral and written examinations are qualified to practice in a manner that ensures patient safety. Each step of the test development and validation process is described in this technical report. Throughout this document, the selected approach is supported by empirical data and research.

Highlights of the present report include the following:

- A summary of the job analysis methodology and results.
- A description of the oral and written examination specifications based on the job analysis.
- A technical overview of the procedures followed to review the medical interpreter oral and written examination item banks and assemble test forms in alignment with the content and statistical specifications.
- A summary of the technical properties of the medical interpreter oral and written examinations, including the recommended minimum passing scores.

## Job Analysis

The examinations are founded upon a national job analysis of the medical interpreter occupation. PSI and LLU conducted a job analysis study using a multiple-method approach, incorporating expert judgments of an advisory committee and a national survey of practicing medical interpreter professionals and supervisors.

### Expert Advisory Panel

PSI worked with LLU to assemble a preliminary inventory of professional activities, job knowledge and skills. In accordance with PSI instructions, LLU convened an advisory committee to review and define the list of professional activities performed, and the knowledge and skills required for competent practice in the medical interpreter profession. The advisory committee comprised 44 experienced medical interpreting professionals representing various regions of the United States. Qualifications of the advisory committee members included extensive experience in medical interpreter training and training development, as well as medical interpreting skills assessment and test design, degrees in medicine and practice in related healthcare fields. Furthermore, the advisory committee members had received higher education in interpreting and translation, current work experience as active medical interpreters, coordinators of interpreter services, and language access advocates. During this phase, experts in the field of medical interpreting reviewed and modified a preliminary list of 76 professional activities and 88 knowledge statements, along with 38 proposed demographic questions. The medical interpreting experts reviewed and finalized the content to be included in the survey.

### Survey Development

PSI developed a survey instrument incorporating the professional activities and required knowledge identified by the above expert advisory committee, in order to confirm the relevance and importance of the items to medical interpreters nationwide. A set of nine preliminary demographic items were added in the beginning of the survey and 29 additional background questions were added in the last section of the survey. The survey included three rating scales to be used by survey respondents to provide a quantitative estimate of the job relevance of each activity, knowledge and skill.

***Professional Activity Rating Scales.*** The job analysis survey included three (3) rating scales. The questions, response options, and numerical representations are presented below:

1. **Frequency:** Respondents were asked, “How often do you perform this activity or task?”

Response options were: “Never” (0), “Less than Monthly” (1), “At Least Monthly” (2), “At Least Weekly” (3), and “Twice Weekly or More” (4).

2. **Importance:** Respondents were asked, “How important is it that you perform this activity competently?”

Response options were: “Of no importance” (0), “Of little importance” (1), “Moderately important” (2), “Very important” (3), and “Critically Important” (4).

3. **Competence of Activity/Task Necessary for Certification:** Respondents were asked, “How much command in this activity/task should be required to become a Certified Medical Interpreter?”



Response options were: “No Competence” (0), “Some Competence” (1), and “Full Competence” (2).

***Knowledge Rating Scales.*** The job analysis survey included three (3) rating scales that respondents used to assign ratings to each knowledge area:

1. Frequency – Respondents were asked, “How often do you use this knowledge in performing your job?”

Response options were: “Never” (0), “Rarely” (1), “Sometimes” (2), “Frequently” (3), and “Very frequently” (4).

2. Importance – Respondents were asked, “How essential is this knowledge to overall competent performance of your job?”

Response options were: “Not important at all” (0), “Somewhat important” (1), “Moderately important” (2), “Very important” (3), and “Critically important” (4).

3. Command of Knowledge Necessary for Certification – Respondents were asked, “How much command of this knowledge should be required to become a Certified Medical Interpreter?”

Response options were: “No command” (0), “Some command” (1), and “Full command” (2).

PSI developed a web-based version of the job analysis survey using the committee’s suggestions for administration instructions.

### **Survey Sample**

To ensure that the job analysis survey included a representative sample of medical interpreters and medical interpreter supervisors in the United States, LLS contacted relevant stake-holder groups, including professional interpreter associations at both national and state/regional levels, hospitals and other healthcare organizations, colleges and universities that offer healthcare interpreter training programs, healthcare interpreting advocacy groups, medical interpreters (both staff interpreters and freelancers), and members of a Global Advisory Council. The primary goal was to obtain a sample of respondents from each state.

A total of 5,654 e-mail invitations to participate in the survey were sent to practicing professionals in the medical interpreting field, some of whom forwarded the survey on to colleagues, association members and students (therefore, the actual number of recipients exceeded the original number). Of this population, 1,506 individuals completed at least part of the survey. Prior to the last section (additional demographic questions), 1,108 participants had completed the task and knowledge statement sections in their entirety.

In the last section of the survey (Additional demographic information), 157 participants indicated that they were not currently practicing medical interpreters, which resulted in 939 individuals completing the entire survey.

## Analysis and Results of Job Analysis Survey

PSI staff performed a set of preliminary quality control data analysis procedures, resulting in the exclusion of a subset of respondents who failed to respond to at least 66% of the task and knowledge statements.

**Demographic Information.** The background and demographic characteristics of survey respondents are summarized below. The respondents to the current job analysis survey demonstrated acceptable regional distribution for the proportion of states in each census region of the United States. As indicated in Table 1, responses were received from all states. Thus, the job analysis data can be generalized across the United States and is reflective of the profession.

Further description of the survey sample is provided in Table 2 with respect to the medical setting where respondents work, which is shown to encompass a wide range of settings. Additional descriptive tables summarizing the characteristics of the job analysis survey sample are presented in Appendix A, including job status, years of experience, gender, race or ethnicity, and size of market area.

Of the original 1,506 survey respondents, approximately 86% of respondents identified themselves as “Interpreters”, 9% identified themselves as “Coordinator/Supervisor”, and 5% identified with the category titled “Other”.

Table 1. Job Analysis Responses Received Per State

State	Response Count	Percent
ALABAMA	2	.1
ALASKA	2	.1
AMERICAN SAMOA	1	.1
ARIZONA	28	1.9
ARKANSAS	11	.7
CALIFORNIA	391	26.0
COLORADO	31	2.1
CONNECTICUT	20	1.3
DELAWARE	6	.4
DISTRICT OF COLUMBIA	3	.2
FLORIDA	97	6.4
GEORGIA	74	4.9
GUAM	1	.1
HAWAII	4	.3
IDAHO	2	.1
ILLINOIS	56	3.7
INDIANA	15	1.0
IOWA	3	.2
KANSAS	4	.3
KENTUCKY	10	.7
LOUISIANA	3	.2
MAINE	2	.1

MARYLAND	15	1.0
MASSACHUSETTS	126	8.4
MICHIGAN	18	1.2
MINNESOTA	13	.9
MISSISSIPPI	2	.1
MISSOURI	20	1.3
MONTANA	1	.1
NEBRASKA	11	.7
NEVADA	13	.9
NEW HAMPSHIRE	2	.1
NEW JERSEY	24	1.6
NEW MEXICO	15	1.0
NEW YORK	58	3.9
NORTH CAROLINA	32	2.1
NORTH DAKOTA	1	.1
OHIO	28	1.9
OKLAHOMA	2	.1
OREGON	16	1.1
PALAU	2	.1
PENNSYLVANIA	26	1.7
PUERTO RICO	51	3.4
RHODE ISLAND	8	.5
SOUTH CAROLINA	4	.3
SOUTH DAKOTA	1	.1
TENNESSEE	15	1.0
TEXAS	135	9.0
UTAH	15	1.0
VERMONT	4	.3
VIRGIN ISLANDS	1	.1
VIRGINIA	31	2.1
WASHINGTON	40	2.7
WEST VIRGINIA	1	.1
WISCONSIN	6	.4
WYOMING	3	.2
Total	1506	100.0

Table 2. Medical Setting of Survey Participants\*

Setting	Response Count	Percent
Independent Clinic	271	18.0%
Hospital	581	38.6%
Private Doctor's Office	310	20.6%
Public Health Department	245	16.3%
Health Insurance Company	220	14.6%
Lab, Imaging Center, Other Technical Facility	246	16.3%
Pharmacy	188	12.5%
Other	361	24.0%
Total # of Respondents	1506	-

\*There is overlap in the number of respondents per setting, as interpreters indicated that they worked for one or more of the settings mentioned above.

**Identification of Qualifying Professional Activities.** The job analysis ratings were analyzed to identify professional activities that should be represented in the examination. Professional activities were determined to be qualifying for inclusion in the examination if they met each of the following criteria:

1. Performed by more than 50% of respondents;
2. Mean importance rating was 2.0 or greater (at least moderately important); and
3. Mean competence rating was 1.0 or greater (at least some competence required at the time of certification).

Applying the criteria described above to the activity data resulted in the identification of 49 (of 73) qualifying professional activities. A listing of qualifying professional activities is shown in Appendix B, including summary statistical information.

Note that twenty-four activities/tasks did not satisfy the inclusion criteria for percent of time performed. However, after a careful review of all the statements, a panel of experts determined that, although one of these tasks is not frequently performed, it is still important to the medical interpreting field and competence in this task is necessary at the time of certification. Furthermore, this task met the inclusion criteria for mean importance and competence. Therefore, this particular infrequently performed activity (Interpret consecutively a DNR (do not resuscitate) order) was considered relevant to the medical interpreting professionals at the time of the certification and was included in the next steps of exam construction.

An example of a task statement that was frequently performed and was considered highly important and essential at the time of initial certification by most respondents was "Interpret consecutively for explaining manifestations of illness/condition/disease." An example of a task statement that was not considered important and was not considered essential at the time of initial certification by the survey respondents was "Interpret simultaneously the last rites."

**Identification of Qualifying Knowledge Statements.** The job analysis ratings were also analyzed to identify knowledge areas that should be represented in the examination. Knowledge statements were judged to be qualifying for inclusion on the examination if they met all of the following criteria:

1. Mean importance rating was 2.0 or greater (at least moderately important);
2. Mean command rating was 1.0 or greater (at least some command required); and
3. Required for the performance of at least one qualifying professional activity, as determined during a subsequent linkage process, in which participants linked knowledge statements to task statements.

A total of 86 (of 88) knowledge statements met the criteria to be qualifying for medical interpreters. A listing of qualifying knowledge statements is shown in Appendix C, including summary statistical information. The two knowledge statements that did not meet the inclusion criteria were also confirmed as not being necessary at the time of certification by the panel of experts who reviewed the statements. Therefore, the two statements were not included in the next steps of exam construction.

An example of a knowledge statement that was frequently performed by medical interpreters and was considered highly important and essential at the time of initial certification by most respondents was “Comprehension (e.g., understanding of written and oral messages and their implicit and explicit meaning).” An example of a knowledge statement that was not considered important and was not considered essential at the time of initial certification by the survey respondents was the “Hill-Burton Act.”

## Test Content Specifications

Appropriate test content specifications are critical elements of effective certification examinations to ensure that tests proportionately reflect the medical interpreting domain. For the oral and written examinations, the specifications were developed through a combination of statistical analyses of the responses to the 2009 job analysis survey and through the expert judgment of the job analysis advisory committee. As noted by Morgeson and Campion (1997), the validity of job analysis findings is enhanced when multiple methods are employed and the findings converge. The present study relied on both empirical analyses of the job analysis data and expert judgments to produce the content specifications. Tannenbaum and Wesley (1993) have reported that the two methods tend to produce similar results, and the committee and survey results were found to be consistent in the present study.

### Expert Panel Meeting

Under PSI's guidance and training, LLU convened an advisory committee to review the results of the job analysis to develop content specifications for medical interpreter certification exams, including oral and written formats. The committee comprised experienced medical interpreting practitioners, whose qualifications and participation are described in Appendix D. The 44 committee members were from various regions across the United States.

The committee reviewed the job analysis results bearing in mind the criteria for identifying an activity or knowledge statements as "qualifying." Committee members reviewed the job analysis response rates, respondent characteristics, and the professional activity and knowledge rating results. In all, the committee members retained a total of 86 knowledge statements.

**Activity-Knowledge Linkages.** Once the domain of activities and knowledge statements was defined, the committee provided a formal linkage between the knowledge areas and professional activities. Each of the knowledge statements was classified into one of 10 general knowledge areas, by a panel of subject matter experts. The committee first confirmed that the major topics of the outline were appropriate designations of knowledge areas, and that each of the qualifying knowledge statements were appropriately classified in one of the general areas. The purpose of the linkage process was to explicitly confirm that the knowledge areas are important for the performance of one or more qualifying activities. This was the final criterion for deciding whether each of the professional activities included in the job analysis survey could be considered qualified for inclusion in the examination. Committee members were asked to determine independently whether knowledge classified within each general topic would be required for competent performance of each professional activity. Inversely, the committee members were asked to list each activity that would require the use of the knowledge listed. After the linkages were completed, the percentage of committee members verifying each link was computed. Following the practice of Harari and Zedeck (1973), a knowledge area was judged to be required for the performance of a professional activity if at least 60% of advisory committee members concurred in finding a link between the knowledge area and at least one activity.

### Test Content Outline

The national job analysis served as a basis for the development of a content outline for a medical interpreter certification examination. During the expert panel meeting, SMEs drafted content outlines for both oral and written examinations, based on the information obtained from the job analysis. The test specifications emanating from the oral and written exam content outlines reflect the content

weighting recommended by SMEs, as outlined in Table 3. The content included in these outlines was determined through a discussion of what would be appropriate to test via oral exam vs. written exam. As seen in the tables below, there is overlap in the content that is covered in the oral and written exams.

A detailed content outline for the oral exam and written exams are shown in Appendices E and F, respectively. All of the Topics, Subtopics, and elements listed in the content outlines were deemed relevant and important by the survey participants and the panel of subject matter experts. The topics are directly related to the knowledge areas and the subtopics to the knowledge statements that were included in the Job Analysis Survey.

Table 3. Medical Interpreter Oral and Written Examination Content Outline

<b>Topic</b>	<b># Scenarios on Examination</b>	<b>% of Examination</b>
<b>Oral Exam</b>		
Mastery of Linguistic Knowledge of Primary Language	7	15%
Mastery of Linguistic Knowledge of Secondary Working Language	7	15%
Interpreting Knowledge and Skills	12	25%
Cultural Competence	5	10%
Medical Terminology in Working Languages	12	25%
Medical Specialties in Working Languages	5	10%
TOTAL	48	100%
<b>Written Exam</b>		
Roles of the Medical Interpreter	4	8%
Medical Interpreter Ethics	8	15%
Cultural Competence	4	8%
Medical Terminology in Working Languages	19	38%
Medical Specialties in Working Languages	11	23%
Interpreter Standards of Practice	3	5%
Legislation and Regulations	2	3%
TOTAL	51	100%

## Examination Development

### Training

PSI initially conducted a training session on item writing and standard setting (modified Angoff rating) processes with LLU in January 2009. Furthermore, PSI staff provided other training materials, such as rating forms and presentations, so that LLU employees could conduct expert review meetings. PSI also conducted a similar training session with IMIA in August 2009 staff in order to familiarize them with the process.

### Oral Exam Item Development

LLU assembled a team of test designers with extensive experience in the fields of medical interpreting, medical practice and test design and development to serve as subject matter experts (see Appendix D). The subject matter experts received intensive training according to the specifications and guidelines provided by PSI. The training sessions covered PSI's *Item Reviewing and Writing Principles* and modified Angoff rating process.

Following the training, the oral test design team worked for three months on the development of the test items in a sufficient quantity to be representative of a broad range of medical knowledge and to exceed the number of test items needed to create three distinct test forms. This process involved intensive work and re-work, as well as the development of an exhaustive scoring dictionary for rating purposes, which included individual point values accorded for each possible response.

### Written Exam Item Development

IMIA utilized a team of internal item writers with extensive experience in medical interpreting and test administration to serve as subject matter experts, who received the same comprehensive training (See Appendix G). The written exam test design team gathered reference materials and other sources used in the industry and drafted items based on the content specifications. The number of written exam items generated exceeded the number of items required to create a test form.

### Item Review

LLU and IMIA each convened separate panels of subject matter experts to review and formally evaluate the medical interpreter oral and written exam items, after confirming the content specifications. The expert panels evaluated each item with respect to relevance to occupational requirements, the need for competence upon certification and estimated difficulty for initial certification candidates.

The item review process included trainings session for the members of the advisory panels of subject matter experts, covering PSI's *Item Reviewing and Writing Principles* and modified Angoff rating process. After training, the advisory panel members reviewed the test items developed for the exam.

Advisory panel members rated each item as follows:

1. Item Acceptable – Panelists were asked, “Is this item acceptable for use on the certification exam?” by selecting “Yes” (1), “No” (2), or “OK as edited” (3).
2. Relevance – Panelists were asked, “How relevant is this item to overall competent performance of a medical interpreter’s job?” Response options were: “Of no importance” (1), “Of little importance” (2), “Moderately important” (3), “Very important” (4), and “Critical” (5).



3. Difficulty – Panelists participated in a modified Angoff procedure (described below) to identify the percentage of candidates, at initial time of certification, who would answer the question correctly.

### **Standard Setting**

PSI utilized a modified Angoff method to determine the recommended passing score, or cut score, for the oral and written examinations. The Angoff method is among the best known and most studied methods of standard-setting, and has accumulated considerable empirical evidence to support its validity (Hurtz & Auerbach, 2003). In this process, experts are asked to rate the percentage of candidates (at the time of initial certification) who would successfully answer each item on the examination. After each expert has completed these ratings, mean ratings are determined for each item. These mean ratings were aggregated to determine the cut score for a specific examination, based upon the items included on the exam.

### **Analysis of Ratings**

PSI staff conducted statistical analyses of the oral and written item ratings provided by the committee members. Ratings were averaged across all raters who provided data for an item. Item acceptability was calculated by examining the percentage of raters who rated an item “Acceptable” for those items that did not need to be modified or “OK as Edited” for those items that were modified in order to be acceptable. An item was considered acceptable if 60% or more of the raters deemed it so. Item relevance and item competence ratings were evaluated to determine which items were appropriate for the exam. If an item had a mean relevance of less than 3, the item was marked for future revision or removal from the item pool. Items with relevance ratings of 3 or higher were retained.

## **Test Form Construction**

Experimental forms of the oral and written exams were assembled and pilot tested separately. PSI analyzed the test item response data to cast equivalent alternate forms of the oral and written examinations. Further details regarding the methodology are described below.

### **Experimental Test Forms**

PSI worked with LLU to assemble three experimental forms of the oral examination, including the scenarios and scoring rubric. Each of the three forms was comprised of two parts, including sight interpretation (6 segments and 30 scoring units) and consecutive interpretation (15 scenarios and 180 scoring units), for a total of approximately 21 test items and 210 scoring units per form.

Although the content outline specified a 51-item exam, PSI assembled a 57-item written pilot examination, which included six additional items beyond what was specified in the content outline. The exam included these additional items in order to collect sufficient data on all items in the item pool. All items were entered into PSI's proprietary system, ATLAS™, which then generated random forms for the pilot test candidates.

### **Pilot Testing for Oral Exam**

LLU selected and trained raters to evaluate examinee performance on the oral exam, and then conducted pilot testing sessions with the oral exam.

### ***Rater Selection for Oral Exam***

LLU conducted an intensive process for the selection of raters, utilizing input from higher institutions of learning, such as the Monterey Institute of International Studies, and healthcare organizations and professional associations, to form a pool of potential raters to be used in the pilot testing process. The recommendations and resumes of candidates for this role were meticulously reviewed and only the most qualified candidates were then invited for an interview. The interview process gleaned additional information regarding each candidate and their background, education, and experience in the field, as well as other important elements in rater qualification, such as demeanor, pronunciation and enunciation, and tone of voice. The candidate chosen for this role met the highest standards in all of the aforementioned areas.

### ***Rater Training for Oral Exam***

Intensive training was conducted with the raters selected and included practice with delivery and also calibration sessions with the scoring rubric. The scoring rubric is comprised of a methodology that includes both subjective and objective elements to capture the entire skill set needed to qualify as a certified medical interpreter. Each of the scenarios on the examination included units that are scored on the following factors: linguistic equivalence, conservation of register, grammatical correctness, and pronunciation. There is also a holistic rating, which applies to the entire segment. Within each of these factors, there are detailed performance elements that are described in the scoring rubric. Furthermore, instruction was also provided in the proper management of responses not included in the scoring key, which entails review by the test design team. The pilot testing phase only began once the raters had reached a level of consistency through calibration exercises, as well as quality in the delivery of the exam.

### **Administration and Results**

LLU conducted a nationwide recruitment of medical interpreters to complete one of the experimental oral exams for the pilot study. Pilot participants came from all regions of the country and included representation from colleges and universities, healthcare institutions, professional interpreter associations, and included free-lance professional interpreters, staff interpreters and dual-role interpreters. A proctor was identified at each testing location and provided with detailed instruction in the confidential test delivery process. This element represented a means of ensuring test security and, ultimately, valid test results.

Pilot testing was administered remotely to at least 100 medical interpreters per experimental Form 1, Form 2, and Form 3. The evaluators were given detailed instruction on how to use the scoring rubric. For a subset of participants in the pilot study, two raters completed the scoring rubric to enable calculation of reliability statistics for the oral exam, to gauge the effectiveness of the scoring rubric. LLU collected the oral exam ratings and created a data file for analysis by PSI. PSI conducted preliminary edit checks of the data file and worked with LLU to ensure that the data were accurate.

Statistical analyses of the experimental forms were conducted, which are summarized in Table 4, including the number of examinees completing the form (N), number of item scoring units, mean rating, standard deviation (SD), Cronbach's alpha coefficient of internal consistency reliability, mean relevance rating, the mean Angoff rating, and the inter-rater correlation index of rating reliability for a subset of examinees (N=59). The scoring rubric was found to be highly reliable, as evident by the interrater reliability of .98, thus reflecting the high quality and effectiveness of the rater training. The entirety of the rigorous statistical analysis carried out by use of all the aforementioned methods supports the test's high degree of reliability and validity.

Table 4: Oral Exam Pilot Form Descriptive Statistics

	N	# Scenarios / # Scoring Units	Mean	SD	Cronbach's Alpha	Mean Relevance Rating	Mean Angoff Rating	Rater Correlation*
<b>Form 1</b>								
Sight	103	6 / 30	39.80	6.30	0.71	3.50	68.96	
Consecutive	103	15 / 180	216.49	43.58	0.96	3.12	73.46	
Total	103	21 / 210	256.28	46.90	0.96	3.31	71.21	
<b>Form 2</b>								
Sight	100	6 / 30	42.36	6.80	0.79	3.67	69.50	
Consecutive	100	15 / 180	195.88	43.91	0.96	2.97	71.92	
Total	100	21 / 210	238.24	48.42	0.96	3.32	70.71	
<b>Form 3</b>								
Sight	100	6 / 30	32.30	12.60	0.96	3.67	57.00	0.98
Consecutive	100	15 / 180	159.15	55.96	0.99	3.03	74.15	0.98
Total	100	21 / 210	191.45	67.75	0.99	3.35	65.57	

\*N=59

### **Pilot Testing for Written Exam**

IMIA conducted a nationwide recruitment of medical interpreters to complete the written exam for the pilot study, by sending an invitation to 1,500 medical interpreters. Pilot participants came from all regions of the country (See Appendix H). The examination was administered at PSI test centers, where a proctor was present at the test site and provided pilot test candidates with detailed instructions in the confidential testing process.

### **Administration and Results**

The pilot written examination was administered to over 250 medical interpreters. Statistical analyses of the experimental items were conducted, which are summarized in Table 5, including the number of candidates, number of items analyzed, mean p-value, p-value range, mean point-biserial, and point-biserial ranges.

The p-value refers to the percentage of candidates answering an item correctly, and reflects the difficulty of the item. Generally speaking, items with p-values between .30 and .95 are preferred. The range of p-values in Table 1 indicates that there some items on the exam were extremely easy (i.e., p-value = 1.000) or difficult (i.e., p-value = .217), and thus removed from the item bank.

The point-biserial correlation indicates the degree to which performance on an item is related to performance on the overall exam, and can range from -1.0 to +1.0. Generally, the point-biserial should be greater than zero and statistically significant; a threshold value of .15 is desirable. Low or negative point biserial values indicate that the item is not predicting candidate performance the same way the test does, suggesting a likely flaw. Items with negative or low point biserial values were deactivated and recommended for revision.

Table 5: Written Exam Pilot Form Descriptive Statistics

<b>Statistical Index</b>	<b>Values</b>
Number of candidates	257
Number of items analyzed	106
Mean P-value	.821
P-value Range	.217 to 1.00
Mean Point-biserial	.174
Point-biserial Range	-.216 to .415

## Test Form Assembly

### *Oral Exam*

The test item statistics were reviewed and served as a basis for assembling three alternate oral exam forms (A, B, and C) that are all representative of the content outline and statistically equivalent (i.e., comparable in mean, SD, and reliability). The item-level statistics for the items comprising each new test form are shown in Appendix I.

Statistical properties of the resulting oral examination Forms A-C are summarized in Table 5. These new forms were comprised of a combination of items from the experimental Forms 1, 2, and 3. Item selection for each new exam form was based on content and statistical equivalence, as well as the mean Angoff rating. Also, the inter-rater reliability ratings for Form C were taken into consideration, because two raters scored the items on this form. Furthermore, the new test forms were cast shorter than the experimental versions to reduce testing time and the potential for test fatigue. The consecutive/oral section was reduced from 15 to 12 scenarios.

Table 6: Statistical Properties of the Oral Examination Forms

	N	# Scenarios / # Scoring Units	Mean	SD	Cronbach's Alpha	Average Relevance Rating	Average Angoff Rating
<b>Form A</b>							
Sight	103	6 / 30	37.62	9.27	0.91	3.83	62.00
Consecutive	103	12 / 144	165.10	37.25	0.96	3.17	72.03
Total	103	18 / 174	202.72	46.52	0.97	3.50	68.69
<b>Form B</b>							
Sight	100	6 / 30	37.96	9.98	0.91	3.53	60.71
Consecutive	100	12 / 144	165.45	33.05	0.95	2.98	73.51
Total	100	18 / 174	203.41	43.03	0.96	3.26	69.24
<b>Form C</b>							
Sight	100	6 / 30	37.96	9.98	0.91	3.53	60.71
Consecutive	100-103	12 / 144	164.56	39.28	0.94	3.05	75.19
Total	100-103	18 / 174	202.52	49.26	0.95	3.29	70.36

### *Written Exam*

On the basis of the statistical analysis, items that had extremely high or low p-values or negative point biserial values were deactivated, taking into account the number of items available in the topic area. Therefore, 15 items were deactivated on the exam and submitted for further editing. This resulted in 91 active items in the item pool and 15 newly revised experimental items. These items were used operationally in PSI's proprietary automated test generation system called FormCast<sup>TM</sup>, which assembles a unique equivalent test for each certification candidate, comprised of 51 scored items and 9 experimental items. FormCast<sup>TM</sup> was designed with the needs of licensure and

certification testing programs in mind, striking a balance between content and psychometric requirements in assembling test forms.

The content outline presented in Table 7 shows the topic areas on the written exam, the number of items appearing on the exam per topic, and the number of items available in the item pool.

Table 7: Medical Interpreter Written Exam Content Outline and Number of Items

<b>Topic Area</b>	<b>Number of Items to appear on Exam</b>	<b>Number of Available Items in Item Pool</b>
Roles of Medical Interpreter	4	7
Medical Interpreter Ethics	8	13
Cultural Competence	4	6
Medical Terminology	19	35
Medical Specialties	11	21
Interpreter Standards of Practice	3	5
Legislation and Regulations	2	4
<b>Total Number of Items</b>	<b>51</b>	<b>91</b>

Furthermore, an analysis of the 91-item pool was conducted to identify statistical properties of the average of 1,000 alternate exam forms assembled from the item pool (Monte Carlo analysis). These values for the exam total score mean, standard deviation, and reliability (alpha coefficient) serve as parameters for casting forms from the item bank and also reflect the statistical properties of the forms (See Table 8).

Table 8: Statistical Properties of the Medical Interpreter Written Exam

<b>Statistical Index</b>	<b>Target Values</b>
Mean	41.65
Standard Deviation	4.91
Reliability	.795

### **Recommended Minimum Passing Scores**

On the basis of the mean Angoff ratings for the selected items, an overall cut score of 70% was established for the medical interpreter certification oral examination and 75% for the written medical interpreter examination.

## **Summary and Conclusion**

The medical interpreter certification oral and written examination development project involved a national job analysis with representation from across the US that included a wide range of medical and interpreting settings. Per the established protocol for test development, the exam content specifications were founded upon the statistical data from the job analysis survey and input from subject matter experts, which then served to guide test item development and standard setting. An extensive pilot test phase and rigorous psychometric analysis provided the basis for assembling statistically equivalent oral and written examination forms that meet rigorous psychometric criteria for content validity and high measurement quality.

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## Appendices

## Appendix A. Job Analysis Survey Sample Characteristics\*

### Table A.1. Full -time, Part Time, and On Call

<b>Job Status</b>	<b>Percent</b>	<b>Frequency</b>
Part-time (20 hours or less)**	21.0%	139
Full-time (up to 40 hours)	58.5%	388
As needed/On-call	29.4%	195
Total		663

### Table A.2. Years of Experience as a Medical Interpreter

<b>Number of Years</b>	<b>Percent</b>	<b>Frequency</b>
0 - 1 year	14.7%	138
2 - 5 years	32.5%	305
6 - 10 years	25.5%	239
11 - 15 years	14.8%	139
More than 15 years	12.6%	118
Total	100%	939

### Table A.3. Gender

<b>Gender</b>	<b>Percent</b>	<b>Frequency</b>
Male	25.2%	374
Female	74.8%	1112
	100%	1486

\*Frequency of responses vary as these were optional questions on the survey

\*\*There is overlap between the Part-time and As needed/On -call Status

**Table A.4. Race or Ethnicity**

<b>Race or Ethnicity</b>	<b>Percent</b>	<b>Frequency</b>
White	28.7%	427
Black or African American	3.8%	57
Hispanic or Latino	38.8%	577
Native American or Alaska Native	0.3%	5
Asian	21.2%	315
Native Hawaiian or Other Pacific Islander	0.1%	2
Two or more races	4.0%	60
Other	3.0%	45
Total	100%	1488

**Table A.5. Size of Market Area**

<b>Size of Town/City of Residence or Work</b>	<b>Percent</b>	<b>Frequency</b>
Small, rural (less than 5,000 people)	3.9%	59
Small to mid-size town (5,000 - 30,000 people)	14.5%	219
City (30,000 - 100,000 people)	33.5%	504
Large metropolitan area (more than 100,000 people)	48.1%	724
Total		1506

## Appendix B. Qualifying Professional Activities

### Table B. Medical Interpreter Qualifying Professional Activity Criteria Ratings

Tasks and Activities	N	% Performed	Frequency Mean	Importance Mean	Command Mean
1. Interpret consecutively for completing intake/registration forms.	1506	94	3.05	3.52	1.8
2. Interpret consecutively for providing insurance information.	1506	92.8	2.98	3.33	1.69
3. Interpret consecutively for conveying directions to specific locations	1506	94.1	2.79	3.16	1.52
4. Interpret consecutively during the taking of vital signs.	1506	91.8	2.81	3.54	1.81
5. Interpret consecutively during the taking of a medical history.	1506	97	3.33	3.75	1.91
6. Interpret consecutively during the taking of current symptoms/complaints.	1506	97	3.42	3.77	1.92
7. Interpret consecutively for explaining manifestations of illness/condition/disease.	1506	97.2	3.38	3.77	1.93
8. Interpret consecutively during the discussion of treatment options.	1506	97.1	3.26	3.75	1.91
9. Interpret consecutively during physical therapy.	1506	88.8	2.19	3.34	1.74
10. Interpret consecutively to describe scheduled procedures.	1506	96.4	3	3.53	1.82
11. Interpret consecutively for provider's explanation of consent forms.	1506	96.3	3.01	3.64	1.85
12. Interpret consecutively to convey medical test and procedure results.	1506	96.3	3.07	3.7	1.9
13. Interpret consecutively for medication administration and dosage instructions.	1506	96.1	3.19	3.8	1.9
14. Interpret consecutively for instructions about the use of specialized equipment.	1506	92	2.26	3.49	1.77
15. Interpret consecutively to provide patient discharge instructions.	1506	93.8	2.96	3.6	1.84
16. Interpret consecutively to provide instructions for follow-up care and appointments.	1506	96.5	3.17	3.49	1.77
17. Interpret consecutively for the individual preparing birth and death certificates.	1506	64.3	1.33	3.15	1.61
18. Interpret consecutively the LEP patient's questions for the medical provider.	1506	94.6	3.26	3.63	1.86
19. Interpret consecutively for family medical conferences.	1506	81.8	1.78	3.43	1.82
20. Interpret consecutively for outbound calls to patients and family members.	1506	91	2.75	3.32	1.73

<b>Tasks and Activities</b>	<b>N</b>	<b>% Performed</b>	<b>Frequency Mean</b>	<b>Importance Mean</b>	<b>Command Mean</b>
21. Interpret consecutively for grievances and complaints of patients and insured parties.	1506	82.5	1.87	3.24	1.69
22. Interpret consecutively for Patient Education classes.	1506	77.5	1.67	3.24	1.72
23. Interpret consecutively for Visiting Nurse and Home Health Care visits.	1506	73.3	1.87	3.25	1.73
24. Interpret consecutively procedure instructions given by the provider to the LEP patient.	1506	93.8	2.96	3.64	1.87
25. Interpret consecutively pre-op instructions given by the provider to the LEP patient.	1506	92	2.66	3.69	1.9
26. Interpret consecutively post-op instructions given by the provider to the LEP patient.	1506	91	2.57	3.65	1.87
27. Interpret consecutively a Living Will.	1506	50.7	0.9	3.23	1.69
28. Interpret consecutively a Medical Power of Attorney.	1506	51.1	0.83	3.25	1.71
29. Interpret consecutively a DNR (do not resuscitate) order.**	1506	44.4	0.72	3.47	1.8
30. Interpret consecutively the last rites.*	1506	30.3	0.47	3.13	1.61
31. Interpret consecutively prayers/spiritual counsel/beliefs.*	1506	46.1	0.73	2.9	1.48
32. Other consecutive interpretation activities (please specify):	-	-	0	0	0
33. Interpret simultaneously for Patient Education classes.	1506	48.9	0.93	3.08	1.67
34. Interpret simultaneously for Group Therapy sessions.*	1506	34.5	0.56	3.02	1.64
35. Interpret simultaneously a Living Will.	1506	22.8	0.36	3.06	1.62
36. Interpret simultaneously a Medical Power of Attorney.*	1506	25.8	0.39	3.09	1.65
37. Interpret simultaneously a DNR (do not resuscitate) order.*	1506	22.9	0.36	3.26	1.69
38. Interpret simultaneously the last rites.*	1506	17.3	0.26	2.95	1.54
39. Interpret simultaneously prayers/spiritual counsel/beliefs.*	1506	30.4	0.47	2.84	1.47
40. Sight translate Organ Donation forms from English into LEP patient's language.*	1506	28.1	0.41	3.28	1.73
41. Sight translate consent forms from English into LEP patient's language.	1506	52.5	1.21	3.31	1.74

<b>Tasks and Activities</b>	<b>N</b>	<b>% Performed</b>	<b>Frequency Mean</b>	<b>Importance Mean</b>	<b>Command Mean</b>
42. Sight translate treatment plan(s) from English into LEP patient's language.	1506	51.5	1.2	3.32	1.76
43. Sight translate dietary guidelines from English into LEP patient's language.	1506	52.3	1.09	3.15	1.67
44. Sight translate medication instructions from English into LEP patient's language.	1506	55.3	1.4	3.44	1.79
45. Sight translate letters from LEP patient's language into English.*	1506	42.9	0.78	3.02	1.61
46. Other sight translation activities (please specify):	-	0	0	0	0
47. Translate written dosage instructions into LEP patient's language.	1506	58.1	1.38	3.48	1.78
48. Translate written therapy instructions into LEP patient's language.	1506	50.4	1.04	3.25	1.71
49. Translate written address/directions into LEP patient's language.	1505	54.2	1.2	2.96	1.49
50. Translate appointment information into LEP patient's language.	1502	66.6	1.79	3.08	1.54
51. Translate pre-op instructions into LEP patient's language.	1491	57.6	1.39	3.4	1.76
52. Translate post-op instructions into LEP patient's language.	1481	57.8	1.42	3.41	1.77
53. Translate at home care instructions into LEP patient's language.	1475	56	1.33	3.27	1.71
54. Translate home exercise program into LEP patient's language.	1472	50.3	0.98	3.03	1.58
55. Translate birth and death certificates into LEP patient's language.*	1471	31.3	0.57	2.99	1.56
56. Translate health inspection documents into LEP patient's language.*	1467	25.5	0.47	2.9	1.55
57. Translate Public Health information into LEP patient's language.*	1464	41.6	0.79	2.95	1.58
58. Translate dietary and nutritional information into LEP patient's language.	1460	55.2	1.2	3.09	1.62
59. Translate medical records into LEP patient's language.*	1458	40.1	0.79	3.13	1.68
60. Translate vaccination records into LEP patient's language.*	1457	39.6	0.77	3.1	1.65
61. Translate autopsy reports into LEP patient's language.*	1453	12.7	0.21	3.07	1.65
62. Translate Patient Education information into LEP patient's language.*	1452	49.9	1.04	3.02	1.6

<b>Tasks and Activities</b>	<b>N</b>	<b>% Performed</b>	<b>Frequency Mean</b>	<b>Importance Mean</b>	<b>Command Mean</b>
63. Other translation activities (please specify):	-	0	0	0	0
64. Speak in-language to accompany LEP patient to a specific location, appointment, or office visit.*	1441	49.5	1.24	2.91	1.53
65. Speak in-language to LEP patient to provide directions to a specific location.	1435	66.5	1.65	2.94	1.46
66. Speak in-language to LEP patient when booking appointments.	1431	67.7	1.92	2.92	1.45
67. Speak in-language to bilingual providers to ensure their ability to communicate effectively with LEP patients.	1428	53.8	1.37	3.03	1.61
68. Speak in-language when conducting a pre-session with LEP patient.	1423	58.2	1.6	3.02	1.62
69. Speak with medical provider in English prior to contact with LEP patient.	1417	75.6	2.32	3.1	1.69
70. Speak in-language to LEP patient's family members in the event that the patient is unconscious or indisposed.	1413	55.1	1.12	3.25	1.72
71. Other activities in which you speak in a second language only (please specify).	-	0	0	0	0
72. Enter LEP patient data into medical records.*	1406	24.4	0.67	2.83	1.46
73. Keep a record of interpretation assignments and details of interpreting encounters.	1403	55.8	1.94	2.88	1.46
74. Photocopy and file medical records and documents.*	1403	12.6	0.33	2.1	1.05
75. Upgrade your skills and knowledge in medical interpreting (i.e., attending interpreter conferences/workshops, reading/studying, etc.).	1401	83.5	1.99	3.39	1.75
76. Other activities (please specify).	-	0	0.00	0.00	0.00

\* These items were removed from further steps in exam development as they did not meet the statistical threshold for the frequency mean, importance mean or command mean.

\*\* These items did not meet the statistical threshold for the frequency mean, importance mean or command mean, however SMEs suggested for it to be included in the exam construction process.

## Appendix C. Knowledge Statements

### Table C. Medical Interpreter Knowledge Statement Criteria Ratings

Knowledge Statements	N	% Performed	Frequency Mean	Importance Mean	Command Mean
<b>Topic 1: Roles of the Medical Interpreter</b>					
1. Role of Conduit (e.g., transmitting information into target language without adding, omitting, changing register, editorializing or summarizing)	1137	97.4	3.65	3.69	1.91
2. Role of Clarifier (e.g., asking for a repetition, clarification or verification to ensure the accuracy of interpreted rendition)	1137	98.7	2.95	3.59	1.88
3. Role of Culture (e.g., briefly explaining cultural issues and differences to facilitate understanding between provider and LEP patient)	1137	96	2.44	3.27	1.72
4. Role of Patient Advocate (e.g., advocating for LEP patient to ensure understanding, communication, etc.)	1137	88.3	2.21	3.05	1.64
<b>Topic 2: Medical Interpreter Ethics</b>					
5. Confidentiality (e.g., protecting information conveyed during interpreting encounter)	1137	98.2	3.77	3.80	1.91
6. Accuracy and completeness (e.g., maintaining meaning and spirit of information conveyed without any alteration)	1137	98.8	3.79	3.80	1.94
7. Impartiality (e.g., refraining from any appearance of bias through comments, recommendations or personal opinions)	1137	96.7	3.62	3.71	1.91
8. Conflict of Interest (e.g., avoiding personal advantage from information obtained by disclosing any real of perceived conflict of interest)	1137	89.1	2.86	3.55	1.83
9. Scope of Practice (e.g., limiting oneself to interpreting only and avoiding any other activity constituting a service other than interpreting)	1137	95.3	3.37	3.52	1.83
10. Disqualification/Impediments to Performance (e.g., immediately conveying any reservation about ability to complete assignment successfully)	1137	74.3	1.56	3.37	1.78
11. Professional Courtesy (e.g., maintaining professional demeanor, courtesy and an appropriate tone of voice)	1137	99.2	3.86	3.68	1.90
12. Professional Courtesy (e.g., continuing to improve skills and knowledge through training, education, and other means)	1137	98.7	3.28	3.51	1.83
<b>Topic 3: Mastery of Linguistic Knowledge of Primary Language</b>					
13. Grammar (e.g., use of tenses, conjugation, articles, prepositions, etc.)	1137	98.6	3.60	3.46	1.84
14. Syntax (e.g., sentence structure and word order)	1137	98.6	3.55	3.44	1.84



<b>Knowledge Statements</b>	<b>N</b>	<b>% Performed</b>	<b>Frequency Mean</b>	<b>Importance Mean</b>	<b>Command Mean</b>
15. General Vocabulary (e.g., knowledge and use of everyday terminology)	1137	99.3	3.76	3.61	1.91
16. Comprehension (e.g., understanding of written and oral messages and their implicit and explicit meaning)	1137	99.1	3.72	3.70	1.92
17. Idioms (e.g., words or expressions that cannot be understood from the individual meaning of its elements, slang)	1137	96.7	2.96	3.26	1.69
18. Regionalisms (e.g., expressions and sayings used in specific regions)	1137	95.5	2.67	3.04	1.56
<b>Topic 4: Mastery of Linguistic Knowledge of Secondary Working Language</b>					
19. Grammar (e.g., use of tenses, conjugation, articles, prepositions, etc.)	1137	98.4	3.51	3.42	1.82
20. Syntax (e.g., sentence structure and word order)	1137	98.3	3.51	3.40	1.82
21. General Vocabulary (e.g., knowledge and use of everyday terminology)	1137	98.9	3.67	3.54	1.88
22. Comprehension (e.g., understanding of written and oral messages and their implicit and explicit meaning)	1137	98.6	3.64	3.63	1.89
23. Idioms (e.g., words or expressions that cannot be understood from the individual meaning of its elements, slang)	1137	95.8	2.84	3.15	1.64
24. Regionalisms (e.g., expressions and sayings used in specific regions)	1137	95.2	2.63	2.98	1.56
<b>Topic 5: Interpreting Knowledge and Skills</b>					
25. Attentive listening (e.g., techniques for blocking our distractions)	1137	98.9	3.59	3.63	1.86
26. Memory (e.g., information processing styles/techniques, storage methods, and methods for retrieving information)	1137	98.7	3.57	3.57	1.83
27. Analysis (e.g., methods for identifying and grasping main and subordinate ideas)	1137	98.9	3.37	3.44	1.80
28. Abstraction (e.g., methods to separate words and ideas)	1137	97.4	3.05	3.21	1.71
29. Note-taking (e.g., how to identify key words, techniques for abbreviation, common note-taking symbols, ways to personalize note-taking system)	1137	96.3	3.19	3.30	1.70
30. Delivery (e.g., pronunciation and enunciation techniques for second language speakers; normal pace for interpreting to ensure comprehension)	1137	98.9	3.61	3.51	1.84
31. Interpersonal Skills and Customer Service (e.g., how to effectively interact with LEP patients and providers in a therapeutic setting)	1137	98	3.58	3.51	1.83

Knowledge Statements	N	% Performed	Frequency Mean	Importance Mean	Command Mean
<b>Topic 6: Cultural Competence</b>					
32. Cultural practices related to healthcare (e.g., approaches to birth and death, traditional remedies and treatments, etc.)	1137	94.5	2.65	3.13	1.62
33. Familial and relational structures	1137	95.9	2.68	3.03	1.59
34. Societal issues (e.g., taboos, forms of address, etc.)	1137	94.6	2.59	2.99	1.57
35. Religions/spiritual beliefs and practices	1137	93.1	2.31	2.88	1.48
<b>Topic 7: Medical Terminology in Working Languages</b>					
36. Medical Tests and Diagnostic Procedures	1137	96.7	3.20	3.46	1.81
37. Medical Apparatus	1137	90.9	2.41	3.08	1.61
38. Pharmacology (e.g., drug names, characteristics, properties and uses)	1137	96.2	2.81	3.13	1.58
39. Pathologies (e.g., diseases and their causes, processes, and effects)	1137	95.3	2.87	3.22	1.65
40. Symptomatology (e.g., pain descriptors, pain scale, etc.)	1137	97.6	3.43	3.47	1.80
41. Anatomy	1137	96.9	3.22	3.45	1.81
42. Musculoskeletal System	1137	95.4	2.76	3.26	1.71
43. Endocrine System	1137	94.8	2.61	3.24	1.69
44. Cardiovascular System	1137	97.2	2.95	3.41	1.76
45. Respiratory System	1137	97.6	3.02	3.40	1.75
46. Urinary System	1137	97.5	2.91	3.34	1.75
47. Nervous System	1137	97.1	2.69	3.30	1.72
48. Digestive System	1137	97.4	2.98	3.36	1.75
49. Reproductive Systems	1137	96.2	2.79	3.30	1.75
50. Integumentary System	1137	85	1.97	3.03	1.61
51. Treatments (e.g., procedures and therapies used in the treatment of illness)	1137	98.2	3.22	3.40	1.76
52. Healthcare Administration (e.g., policies and procedures related to billing, insurance, etc.)	1137	91.9	2.55	2.85	1.45
53. Acronyms and Abbreviations (e.g., MRI, CAT scan, etc.)	1137	97.7	3.12	3.25	1.71
<b>Topic 8: Medical Specialties in Working Languages</b>					
54. Obstetrics and Gynecology (e.g., women's health issues, including pregnancy, menopause, and childbirth)	1137	96.2	3.03	3.37	1.77
55. Genetic Counseling	1137	81.1	1.74	3.01	1.59
56. Nuclear Medicine	1137	75.3	1.55	2.92	1.55
57. Organ Transplant	1137	68.4	1.25	3.07	1.61
58. Pharmacy	1137	92.9	2.62	3.13	1.60

<b>Knowledge Statements</b>	<b>N</b>	<b>% Performed</b>	<b>Frequency Mean</b>	<b>Importance Mean</b>	<b>Command Mean</b>
59. Geriatrics	1137	83.4	1.85	2.98	1.58
60. Ear, Nose and Throat (ENT)	1137	94.7	2.61	3.19	1.68
61. Pediatrics (e.g., care and treatment of infants and children)	1137	93.1	2.91	3.35	1.74
62. Emergency Medicine (e.g., Public Health, trauma, etc.)	1137	93.1	2.72	3.45	1.78
63. Oncology (e.g., study and treatment of tumors)	1137	89	2.16	3.26	1.71
64. Orthopedics (e.g., treatment of disease/injuries of the spine and extremities)	1137	94	2.87	3.45	1.78
65. Orthopedics (e.g., treatment of disease/injuries of the spine and extremities)	1133	93.4	2.47	3.23	1.69
66. Radiology (e.g., the use of imaging modalities to diagnose illness/disease)	1132	92	2.51	3.16	1.66
67. Nutrition Counseling (e.g., fundamentals of nutrition and its importance)	1129	93.8	2.50	3.08	1.61
68. Physical, Speech and Occupational Therapy (e.g., detection, assessment, prevention, correction, alleviation, and limitation of disability and malfunction)	1129	87.3	2.10	3.05	1.59
69. Urology (e.g., study of the physiology and pathology of the urogenital tract)	1129	90.8	2.25	3.12	1.65
70. Nephrology (e.g., study of the kidneys and their functions and diseases)	1128	90	2.17	3.15	1.66
71. Endocrinology (e.g., physiology of the endocrine glands)	1127	88.4	2.07	3.11	1.64
72. Ophthalmology (e.g., anatomy, functions, pathology and treatment of the eye)	1127	89.5	2.04	3.09	1.63
73. Cardiology (e.g., study of the heart, its actions and diseases)	1127	93.7	2.64	3.35	1.74
74. Neurology (e.g., study of the diseases of the brain)	1124	89.7	2.15	3.21	1.67
75. Hematology (e.g., the biology of blood and its diseases)	1123	97.2	2.03	3.16	1.65
76. Dermatology (e.g., study of the physiology and pathology of the skin)	1122	88.7	1.98	3.02	1.60
77. Psychiatry (e.g., study, diagnosis, treatment and prevention of mental illness)	1120	89.5	2.22	3.19	1.67
78. Respiratory Illness (e.g., study of the ailments of the respiratory system)	1119	92.4	2.60	3.25	1.69
<b>Topic 9: Interpreter Standards of Practice</b>					
79. IMIA (International Medical Interpreter Association) Standards	1119	74.2	2.17	3.02	1.62

<b>Knowledge Statements</b>	<b>N</b>	<b>% Performed</b>	<b>Frequency Mean</b>	<b>Importance Mean</b>	<b>Command Mean</b>
80. NCIHC (National Council on Interpreting in Health Care) Standards	1137	70.3	2.00	2.96	1.60
81. ASTM (American Society of Testing and Materials) Standards	1115	51.5	1.13	2.45	1.33
82. RID (Registry of Interpreters for the Deaf) Standards*	1113	20.8	0.42	2.12	1.13
<b>Topic 10: Legislation and Regulations</b>					
83. Health Insurance Portability and Accountability Act (HIPAA)	1113	80.8	2.54	3.05	1.60
84. Occupational Safety and Health Administration (OSHA)	1113	73.9	1.85	2.75	1.42
85. Joint Commission on the Accreditation of Healthcare Organizations (JCAHO)	1112	53.2	1.41	2.50	1.31
86. Office for Civil Rights (OCR) (e.g., Civil Rights Act of 1964, 2001 Guidance Memorandum, Disadvantaged Minority Health Improvement Act)	1110	54.3	1.37	2.54	1.32
87. Hill-Burton Act*	1109	31.7	0.66	1.98	1.05
88. CLAS (Culturally and Linguistically Appropriate Services) Standards	1109	55.6	1.49	2.43	1.30

\* These items were removed from further steps in exam development as they did not meet the statistical threshold for the frequency mean, importance mean or command mean.

**Appendix D. Oral Examination Expert Advisory Committee**

<b>Expert</b>	<b>Company</b>	<b>Position</b>	<b>*Affiliation with Industry Associations/Positions</b>	<b>Years of Experience</b>	<b>Survey Design</b>	<b>Content Specification</b>	<b>Item Review and Standard Setting</b>
Danyune Geertsen	LLS	Director, Training and Quality Assurance	ASTM, ATA, CHIA, NCIHC	24	Yes	Yes	Yes
Janet Erickson-Johnson	LLS	Certification Manager, Interpreter and Trainer	IMIA, ATA, CHIA	20	Yes	Yes	Yes
Melissa Brac	Language Line University	Senior Language Specialist, Interpreter and Examiner		15+	No	Yes	No
Lucia Pelaez	LLS	Senior Language Specialist, Interpreter and Examiner		7	Yes	Yes	No
Patrick Moore	Athens Regional Medical Center, GA, and University of GA	Interpreter and Instructor	MING	7	No	Yes	No
Ann-Marie Moreno	Freelancer	Interpreter	MING, IMIA	6	Yes	No	Yes
Melida Fernandez-Gomez	LLS	Quality Assurance Manager and Interpreter	TAHIT	20	No	No	Yes
Rebecca Pfahl, MD	LLS	Interpreter and Physician		5	Yes	Yes	No
Haruyo Pearson	LLS and Stanford Hospital	Interpreter			Yes	Yes	No
Ricardo Diaz Canedo, M.D.	Freelancer	Interpreter, Interpreter Trainer and Physician	American Medical Association, California Hispanic American Medical Association, Peruvian American Medical Association	15	No	Yes	No

<b>Expert</b>	<b>Company</b>	<b>Position</b>	<b>Affiliation with Industry Associations/Positions</b>	<b>Years of Experience</b>	<b>Survey Design</b>	<b>Content Specification</b>	<b>Item Review and Standard Setting</b>
David Cardona, M.D.	Oregon State DHS, OR	Interpreter, Interpreter Services Manager and Physician	American Public Health Association, Inter-American College of Physicians and Surgeons, Oregon Health and Science University, Institute for Health Professionals	13	No	Yes	No
Linda Joyce	Freelancer, WVA	Consultant, Interpreter, Trainer and Examiner	NCIHC, MING, ATA, IMIA, CHIA	25	No	No	Yes
Orlin Marquez	Children's Healthcare of Atlanta	Interpreter	MING	7	No	No	Yes
Kathleen Valle	Alegent Health, NE	Interpreter and Operations Director, Language Access	NATI	9	No	No	Yes
Robert Roos	University of Nebraska, NE	Interpreter and Instructor	NATI	14	No	No	Yes
George Donald	Inova Healthcare, VA	Interpreter		19	Yes	Yes	No
Grace Chavez	Language Line University	Interpreter and Lead Examiner	IMIA	15	Yes	No	No
Liz Amaral	LLS	Senior Language Specialist and Interpreter		11	Yes	No	No
Susan Avila	LLS	Senior Language Specialist and Interpreter		13	Yes	No	No
Maria Carmen Wheeler	Denver Health, CO	Interpreter			Yes	No	Yes
Carolyn Wang Kong	Kaiser Permanente, CA	Practice Leader, Language Access	CHIA, NCIHC		Yes	No	No

<b>Expert</b>	<b>Company</b>	<b>Position</b>	<b>Affiliation with Industry Associations/Positions</b>	<b>Years of Experience</b>	<b>Survey Design</b>	<b>Content Specification Item Review and Standard Setting</b>
Claudia Tehrani	Denver Health, CO	Interpreter			Yes	No No
JaNean Freeman	Grady Health, GA	Interpreter and Supervisor			Yes	No No
Luz Ortiz	Wheaton Franciscan Healthcare, WI	Interpreter and Interpreter Manager			Yes	No No
Vinia Pagan	Health Net, CA	Interpreter			Yes	No No
Sandra Sanchez	Grady Health, GA	Interpreter and Director of Language Interpretive Services			Yes	No No
David Jones	Mercy Medical Center, IA	Interpreter and Supervisor			Yes	No No
Noelle Fortier	Northside Hospital, GA	Bilingual Coordinator of Interpreter Services			Yes	No No
Deborah Moore	Parkland Hospital, TX	Patient Relations Manager			Yes	No No
Peggy Payne	CIGNA, CA	Director, Cultural and Linguistics Unit			Yes	No No
Lizbeth Derwas	Denver Health, CO	Interpreter			Yes	No No
Rev. Jose Zepeda	Johnson City Medical Ctr., TN	Interpreter, Chaplain			Yes	No No
Louise Behiel	Calgary Health, Canada	Manager, Translation and Interpretation			Yes	No No

<b>Expert</b>	<b>Company</b>	<b>Position</b>	<b>Affiliation with Industry Associations/Positions</b>	<b>Years of Experience</b>	<b>Survey Design</b>	<b>Content Specification Item Review and Standard Setting</b>
		Svcs.				
Gloria Yacosa	Health Net, CA	Interpreter, Trainer and Linguistic Specialist			Yes	No No
Anel Campos	Health Net, CA	Interpreter			Yes	No No
Nancy Zarenda	CPS Training Center, State of CA	Interpreter and Trainer	NAJIT		Yes	No No
Rebecca Yang	Freelancer	Interpreter			Yes	No No
Fumika Dulay	Johns Hopkins Int'l, MD	Manager			Yes	No No
Libby Arcia	Johns Hopkins Int'l, MD	Interpreter, Trainer and Manager			Yes	No No
Gerardo Alvarez	Denver Health, CO	Interpreter			Yes	No No
Diana Dornelly	U of Miami, FLA	Patient Relations Manager			Yes	No No
Isabel Barrera	Denver Health, CO	Interpreter Program Manager			Yes	No No
Maria Ortega	Health Net, CA	Interpreter Coordinator			Yes	No No
Nubia Stafford	Denver Health, CO	Interpreter			Yes	No No



<b>Expert</b>	<b>Company</b>	<b>Position</b>	<b>Affiliation with Industry Associations/Positions</b>	<b>Years of Experience</b>	<b>Survey Design</b>	<b>Content Specification</b>	<b>Item Review and Standard Setting</b>
Frank Villareal	Health Net, CA	Interpreter Coordinator			Yes	No	No
Seong Kim	Health Net, CA	Interpreter			Yes	No	No
Maria Moreno	Health Net, CA	Interpreter			Yes	No	No
Debbie Sanchez	Health Net, CA	Interpreter			Yes	No	No
Liliana Halperin	Independent, CA	Interpreter			Yes	No	No
Sing Ting C. Yeung	Health Net, CA	Interpreter			Yes	No	No
Consuelo Reynoso	Health Net, CA	Interpreter			Yes	No	No
Izabel Arocha	Cambridge Health Alliance, MA	Interpreter, Cultural and Linguistic Educator	IMIA, FIT, NCHIC, ATA		Yes	No	No
Kendra Haydel	New York Hospital, Queens, NY	Program Coordinator			Yes	No	No

\* Affiliation information is not complete or all-inclusive, since this was not a required criterion for participation in all stages of the test development.

## Appendix E. Content Outline for the Oral Medical Interpreter Certification Examination

Medical Interpreter Oral Examination Content Outline	
<b>Topic 1: Mastery of Linguistic Knowledge of Primary Language</b>	<b>15%</b>
1. Interpret consecutively for completing intake/registration forms	
2. Interpret consecutively for providing insurance information.	
3. Interpret consecutively for conveying directions to specific locations.	
4. Interpret consecutively during the taking of a medical history.	
5. Interpret consecutively during the taking of current symptoms and complaints.	
6. Interpret consecutively for explaining the manifestations of illness/condition/disease.	
7. Interpret consecutively during the discussion of treatment options.	
8. Interpret consecutively during physical therapy.	
9. Interpret consecutively to describe scheduled procedures.	
10. Interpret consecutively for provider's explanation of consent forms.	
11. Interpret consecutively to convey medical test and procedure results.	
12. Interpret consecutively for medication administration and dosage instructions.	
13. Interpret consecutively for instructions about the use of specialized equipment.	
14. Interpret consecutively to provide patient discharge instructions.	
15. Interpret consecutively the LEP patient's questions for the medical provider.	
16. Interpret consecutively for family medical conferences.	
17. Interpret consecutively for outbound calls to patients and family members.	
18. Interpret consecutively for grievances and complaints of patients and insured parties.	
19. Interpret consecutively for Patient Education classes.	
20. Interpret consecutively for Visiting Nurse and Home Health Care Visits.	
21. Interpret consecutively procedure instructions given by the provider to the LEP patient.	

## Medical Interpreter Oral Examination Content Outline

22. Interpret consecutively pre-op instructions given by the provider to the LEP patient.
23. Interpret consecutively post-op instructions given by the provider to the LEP patient.
24. Interpret consecutively a Living Will.
25. Interpret consecutively a Medical Power of Attorney.
26. Interpret consecutively a DNR.
27. Translate dietary and nutritional information into LEP patient's language.
28. Speak in-language to bilingual providers to ensure their ability to communicate effectively with LEP patients.
29. Speak in-language when conducting a pre-session with the LEP patient.
<b>Topic 2: Mastery of Linguistic Knowledge of Secondary Working Language 15%</b>
1. Interpret consecutively for completing intake/registration forms
2. Interpret consecutively for providing insurance information.
3. Interpret consecutively for conveying directions to specific locations.
4. Interpret consecutively during the taking of a medical history.
5. Interpret consecutively during the taking of current symptoms and complaints.
6. Interpret consecutively for explaining the manifestations of illness/condition/disease.
7. Interpret consecutively during the discussion of treatment options.
8. Interpret consecutively during physical therapy.
9. Interpret consecutively to describe scheduled procedures.
10. Interpret consecutively for provider's explanation of consent forms.
11. Interpret consecutively to convey medical test and procedure results.
12. Interpret consecutively for medication administration and dosage instructions.
13. Interpret consecutively for instructions about the use of specialized equipment.

## Medical Interpreter Oral Examination Content Outline

14. Interpret consecutively to provide patient discharge instructions.

15. Interpret consecutively the LEP patient's questions for the medical provider.

16. Interpret consecutively for family medical conferences.

17. Interpret consecutively for outbound calls to patients and family members.

18. Interpret consecutively for grievances and complaints of patients and insured parties.

19. Interpret consecutively for Patient Education classes.

20. Interpret consecutively for Visiting Nurse and Home Health Care Visits.

21. Interpret consecutively procedure instructions given by the provider to the LEP patient.

22. Interpret consecutively pre-op instructions given by the provider to the LEP patient.

23. Interpret consecutively post-op instructions given by the provider to the LEP patient.

24. Interpret consecutively a Living Will.

25. Interpret consecutively a Medical Power of Attorney.

26. Interpret consecutively a DNR.

27. Translate dietary and nutritional information into LEP patient's language.

28. Speak in-language to bilingual providers to ensure their ability to communicate effectively with LEP patients.

### **Topic 3: Interpreting Knowledge and Skills      25%**

1. Interpret consecutively for conveying directions to specific locations.

2. Interpret consecutively during the taking of a medical history.

3. Interpret consecutively during the taking of current symptoms/complaints.

4. Interpret consecutively for explaining the manifestations of illness/condition/disease.

5. Interpret consecutively during the discussion of treatment options.

6. Interpret consecutively during physical therapy.

7. Interpret consecutively to describe scheduled procedures.

## Medical Interpreter Oral Examination Content Outline

8. Interpret consecutively for provider's explanation of consent forms.

9. Interpret consecutively to convey medical test and procedure results.

10. Interpret consecutively for medication administration and dosage instructions.

11. Interpret consecutively for instructions about the use of specialized equipment.

12. Interpret consecutively to provide patient discharge instructions.

13. Interpret consecutively the LEP patient's questions for the medical provider.

14. Interpret consecutively for family medical conferences.

15. Interpret consecutively for outbound calls to patients and family members.

16. Interpret consecutively for grievances and complaints of patients and insured parties.

17. Interpret consecutively for Patient Education classes.

18. Interpret consecutively for Visiting Nurse and Home Health Care Visits.

19. Interpret consecutively procedure instructions given by the provider to the LEP patient.

20. Interpret consecutively pre-op instructions given by the provider to the LEP patient.

21. Interpret consecutively post-op instructions given by the provider to the LEP patient.

22. Interpret consecutively a Living Will.

23. Interpret consecutively a Medical Power of Attorney.

24. Interpret consecutively a DNR.

### **Topic 4: Cultural Competence 10%**

1. Interpret consecutively for family medical conferences.

2. Interpret consecutively for Visiting Nurse and Home Health Care visits.

### **Topic 5: Medical Terminology in Working Languages 25%**

1. Interpret consecutively during the taking of a medical history.

2. Interpret consecutively during the taking of current symptoms/complaints.

3. Interpret consecutively for explaining manifestations of illness/condition/disease.

## Medical Interpreter Oral Examination Content Outline

4. Interpret consecutively during the discussion of treatment options.

5. Interpret consecutively during physical therapy.

6. Interpret consecutively to describe scheduled procedures.

7. Interpret consecutively for provider's explanation of consent forms.

8. Interpret consecutively to convey medical test/procedure results.

9. Interpret consecutively for medication administration and dosage instructions.

10. Interpret consecutively for instructions about the use of specialized equipment.

11. Interpret consecutively to provide patient discharge instructions.

12. Interpret consecutively the LEP patient's questions for the medical provider.

13. Interpret consecutively for family medical conferences.

14. Interpret consecutively for outbound calls to patients and family members.

15. Interpret consecutively for grievances and complaints of patients and insured parties.

16. Interpret consecutively for Patient Education classes.

17. Interpret consecutively for Visiting Nurse and Home Health Care visits.

18. Interpret consecutively procedure instructions given by the provider to the LEP patient.

19. Interpret consecutively pre-op instructions given by the provider to the LEP patient.

20. Interpret consecutively post-op instructions given by the provider to the LEP patient.

21. Interpret consecutively a DNR.

### **Topic 6: Medical Specialties in Working Languages      10%**

1. Interpret consecutively for providing insurance information.

2. Interpret consecutively during the taking of a medical history.

3. Interpret consecutively during the taking of current symptoms/complaints.

## Medical Interpreter Oral Examination Content Outline

4. Interpret consecutively for explaining the manifestations of illness/condition/disease.
5. Interpret consecutively during the discussion of treatment options.
6. Interpret consecutively during physical therapy.
7. Interpret consecutively to describe scheduled procedures.
8. Interpret consecutively for provider's explanation of consent forms.
9. Interpret consecutively to convey medical test/procedure results.
10. Interpret consecutively for medication administration and dosage instructions.
11. Interpret consecutively for instructions about the use of specialized equipment.
12. Interpret consecutively to provide patient discharge instructions.
13. Interpret consecutively to provide instructions for follow-up care and appointments.
14. Interpret consecutively for individual preparing birth and death certificates.
15. Interpret consecutively the LEP patient's questions for the medical provider.
16. Interpret consecutively for family medical conferences.
17. Interpret consecutively for outbound calls to patients and family members.
18. Interpret consecutively for Visiting Nurse and Home Health Care Visits.
19. Interpret consecutively procedure instructions given by the provider to the LEP patient.
20. Interpret consecutively pre-op instructions given by the provider to the LEP patient.
26. Interpret consecutively post-op instructions given by the provider to the LEP patient.
27. Interpret consecutively a Living Will.
29. Interpret consecutively a DNR.

## Appendix F. Content Outline for the Written Medical Interpreter Certification Examination

Medical Interpreter Written Examination Content Outline	% of test	# of items
<b>Topic 1: Roles of the Medical Interpreter</b>	8	4
A. Role of Conduit		
B. Role of Clarifier		
C. Role of Culture Broker		
D. Role of Patient Advocate		
<b>Topic 2: Medical Interpreter Ethics</b>	15	8
A. Confidentiality		
B. Accuracy and completeness		
C. Impartiality		
D. Conflict of Interest		
E. Scope of Practice		
F. Disqualification/Impediments to Performance		
G. Professional Courtesy		
H. Professional Development		
<b>Topic 3: Cultural Competence</b>	8	4
A. Cultural practices related to healthcare		
B. Familial and relational structures		
<b>Topic 4: Medical Terminology in Working Languages</b>	38	19
A. Medical Tests and Diagnostic Procedures		
B. Medical Apparatus		
C. Pharmacology		
D. Pathologies		
E. Symptomatology		
F. Anatomy		
G. Musculoskeletal System		
H. Endocrine System		
I. Cardiovascular System		
J. Respiratory System		
K. Urinary System		
L. Nervous System		
M. Digestive System		
N. Reproductive Systems		
O. Integumentary System		
P. Treatments		
Q. Acronyms and Abbreviations (e.g., MRI, CAT scan, etc.)		
<b>Topic 5: Medical Specialties in Working Languages</b>	23	11



	<b>% of test</b>	<b># of items</b>
<b>Medical Interpreter Written Examination Content Outline</b>		
A. Obstetrics and Gynecology/Genetic Counseling		
B. Organ Transplant		
C. Pharmacy		
D. Ear, Nose and Throat (ENT)		
H. Pediatrics		
E. Emergency Medicine		
F. Oncology		
G. Surgery		
H. Orthopedics		
I. Radiology		
J. Nutrition Counseling		
K. Physical, Speech and Occupational Therapy		
L. Urology and Nephrology		
M. Endocrinology		
N. Ophthalmology		
O. Cardiology		
P. Neurology		
Q. Hematology		
R. Dermatology		
S. Psychiatry		
T. Respiratory Illness		
<b>Topic 6: Interpreter Standards of Practice</b>	<b>5</b>	<b>3</b>
A. IMIA (International Medical Interpreter Association) Standards		
B. NCIHC (National Council on Interpreting in Healthcare) Standards		
C. CHIA (California Healthcare Interpreters Association) Standards		
<b>Topic 7: Legislation and Regulations</b>	<b>3</b>	<b>2</b>
A. Health Insurance Portability and Accountability Act (HIPAA)		
B. CLAS (Culturally and Linguistically Appropriate Services) Standards		
<b>Totals:</b>	<b>100</b>	<b>51</b>

**Appendix G. Written Examination Expert Advisory Committee**

<b>Expert</b>	<b>Company</b>	<b>Position</b>	<b>Affiliation with Industry Associations/Positions</b>	<b>Years of Experience</b>	<b>Item Writing</b>	<b>Item Review</b>	<b>Standard Setting (Rating)</b>
Izabel Arocha, M.Ed	1. Cambridge Health Alliance; 2. Boston University 3. Cambridge College; 4. IMIA	1. Cultural and Linguistic Educator 2. Instructor 3. Instructor 4. President	-IMIA -Federation of Interpreters and Translators -ATA -ISO/TC37/SC/WG6 GAC	30	Yes	Yes	Yes
Abbott Thayer	1. International Medical Interpreters Association (IMIA) 2. Cambridge Health Alliance	1. Project Administrator 2. Medical Interpreter	-IMIA -University of Massachusetts	5	Yes	No	No
Lourdes Sánchez, MS	1. IMIA 2. Boston Medical Center 3. Language Line	1. Former Vice President 2. Former Consultant 3. Senior Manager Implementation	IMIA	16	Yes	Yes	Yes
Nelva Lee	IMIA MITIO	Certification committee member, President	-IMIA -CHIA	17	Yes	Yes	Yes
Linda Joyce	IMIA West Virginia State Representative	Professional interpreter, interpreter trainer, language proficiency tester and language access specialist	Interpreter Network of Georgia, LLS Global Advisory Council		No	Yes	Yes

<b>Expert</b>	<b>Company</b>	<b>Position</b>	<b>Affiliation with Industry Associations/Positions</b>	<b>Years of Experience</b>	<b>Item Writing</b>	<b>Item Review</b>	<b>Standard Setting (Rating)</b>
Renee Palermo	1. Northshore School District 2. Quorum Review IRB 3. Self-Employed 4. Washington Mutual Bank 5. Quintessent Communications, Inc.	1. Spanish Grader 2. Translations Department Supervisor 3. Interpretation Please! Freelance Spanish Interpreter 4. Sr. Financial Systems Analyst, Assistant Vice President, Corporate Planning 5. Systems Analyst	NOTIS, Med SIG	7	No	Yes	Yes
Sofia Oliva	1. Chicago Import Export Inc. 2. Pacific Interpreters 3. Loyola Medical Center 4. Certified Languages International 5. COD College of DuPage 6. Pacific Interpreters	1. Importing 2. Medical Interpreter 3. Interpreter 4. ? 5. Teaching, translating and interpreting 6. Interpreting	IAHI MATI IMIA ATA		No	Yes	Yes
Katherine Langan	Mercy Medical Center, IMIA WV State Representative	Spanish Interpreter and Interpretation Services Department Trainer	GAC		No	Yes	Yes
Jennifer Beauchamp-Ankeny	1. Self-Employed 2. MGH-Chelsea Healthcare Center 3. Embassy of Mexico 4. U.S. Department of State 5. Stanford Hospital and Clinics	1. Freelance Interpreting and Translating 2. Interpreter Services Manager 3. In-house Translator and Interpreter 4. Translator 5. Medical Interpreter	American Translators Association	12	No	Yes	No

Expert	Company	Position	Affiliation with Industry Associations/Positions	Years of Experience	Item Writing	Item Review	Standard Setting (Rating)
Ali Djebli	1. New York School District (Middle & High School) 2. Self-Employed 3. LLS 4. LLS & Other	1. French Teacher 2. Free Lance Interpreter/Translator 3. Arabic & French Legal & Medical Certified Interpreter 4. Quality Specialist/Trainer/LLS Medical Certification Test administrator	LLS	22	No	No	Yes
Shau-lee Chow		1. DSHS certified Mandarin Interpreter in Medical and Social Services 2. Qualified court interpreter in Washington State		15	No	Yes	No
Karin Elliot	1. Russian Language Services Maine 2. Self-Employed 3. Global Survival Network (GSN) - now called Wildlife Alliance	1. Independent Interpreter, Translator, Trainer and Interpreter Evaluator 2. Independent Interpreter and Translation Editor 3. Deputy Director/ Program Co-Director		11	No	No	Yes
Eva Molina			-IMIA -CHIA -ATA -National Collegiate Hispanic Honor Society - SIGMA Delta Pi	15	No	No	Yes
Janet Bonet	Nebraska Association for Translators and Interpreters (NATI)	Founder, Past President, Current Vice President	State Certified Court Interpreter (Spanish/English) in Nebraska and Iowa		No	No	Yes
Angelina Levitskaya, M.A.	1. University of Arkansas for Medical Sciences (UAMS) 2. UAMS	1. Director of the Medical Interpreting Training Program 2. Associate Director of the Russian – American Medical Affiliation Program		30	No	No	Yes

<b>Expert</b>	<b>Company</b>	<b>Position</b>	<b>Affiliation with Industry Associations/Positions</b>	<b>Years of Experience</b>	<b>Item Writing</b>	<b>Item Review</b>	<b>Standard Setting (Rating)</b>
Hank Dallmann	1. New Brunswick Community Interpreter Project in the Office of Community Health at the Robert Wood Johnson Medical School 2. Cross-cultural Communications 3. IMIA	1. Program Coordinator 2. Medical interpreter and licensed interpreter trainer 3. New Jersey Representative			No	No	Yes

**Appendix H. Written Pilot Test Participants by State**

<b>State</b>	<b>Frequency</b>	<b>Percent</b>
AL	1	0.4
CA	40	15.6
CO	8	3.1
CT	3	1.2
FL	7	2.7
GA	11	4.3
HI	1	0.4
IA	9	3.5
IL	19	7.4
KS	1	0.4
KY	1	0.4
MA	23	8.9
MD	5	1.9
MI	2	0.8
MN	4	1.6
MO	2	0.8
MS	1	0.4
NC	19	7.4
NJ	8	3.1
NV	1	0.4
NY	10	3.9
OH	22	8.6
OK	1	0.4
OR	3	1.2
PA	7	2.7
SC	7	2.7
TN	22	8.6
TX	7	2.7
VA	10	3.9

<b>State</b>	<b>Frequency</b>	<b>Percent</b>
WI	2	0.8
<b>Total</b>	<b>257</b>	<b>100</b>

## Appendix I. New Oral Exam Form Data

Table I-1 New Form A

<b>NEW FORM A</b>							
<b>Sight Exam</b>							
<i>Original</i>	<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Item total Correlation</b>	<b>Average Relevance Rating</b>	<b>Average Angoff Rating</b>
<i>Form B, Block 1, Paragraph 1</i>	Block 1, Paragraph 1	100	7.44	1.65	0.68	4.00	66.00
<i>Form B, Block 1, Paragraph 2</i>	Block 1, Paragraph 2	100	6.58	1.03	0.74	4.00	64.00
<i>Form B, Block 1, Paragraph 3</i>	Block 1, Paragraph 3	100	7.93	2.32	0.71	3.00	58.00
<i>Form C, Block 2, Paragraph 1</i>	Block 2, Paragraph 1	100	5.31	2.50	0.90	4.00	67.00
<i>Form C, Block 2, Paragraph 2</i>	Block 2, Paragraph 2	100	4.77	2.32	0.87	4.00	56.00
<i>Form C, Block 2, Paragraph 3</i>	Block 2, Paragraph 3	100	5.60	1.99	0.87	4.00	61.00

<b>NEW FORM A</b>							
<b>Consecutive Exam</b>							
<i>Original</i>	<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Item total Correlation</b>	<b>Average Relevance Rating</b>	<b>Average Angoff Rating</b>
<i>A 1</i>	Item 1	103	13.40	3.84	0.66	2.80	78.75
<i>A 2</i>	Item 2	103	13.04	3.99	0.80	3.80	75.00
<i>A 3</i>	Item 3	103	13.33	3.80	0.73	3.20	73.75
<i>C 3</i>	Item 4	100	12.07	4.39	0.88	1.40	69.00
<i>A 5</i>	Item 5	103	15.11	3.33	0.78	2.40	82.50
<i>A 8</i>	Item 6	103	14.84	3.84	0.86	3.20	76.25
<i>A 9</i>	Item 7	103	15.24	3.89	0.76	2.40	78.75
<i>B 13</i>	Item 8	100	11.38	4.19	0.84	2.00	87.00
<i>A 12</i>	Item 9	103	15.06	4.09	0.84	2.80	75.00
<i>A 13</i>	Item 10	103	14.23	3.85	0.67	2.00	81.25
<i>A 14</i>	Item 11	103	13.77	4.80	0.84	3.20	72.50
<i>A 15</i>	Item 12	103	13.63	3.34	0.74	2.00	86.25

Table I2: New Form B

<b>NEW FORM B</b>							
<b>Sight Exam</b>							
<i>Original</i>	<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Item total Correlation</b>	<b>Average Relevance Rating</b>	<b>Average Angoff Rating</b>
<i>Form C, Block 1, Paragraph 1</i>	Block 1, Paragraph 1	100	5.85	2.41	0.91	4.00	58.00
<i>Form C, Block 1, Paragraph 2</i>	Block 1, Paragraph 2	100	5.25	2.38	0.89	2.80	49.00
<i>Form C, Block 1, Paragraph 3</i>	Block 1, Paragraph 3	100	5.54	2.50	0.90	3.20	51.00
<i>Form A, Block 2, Paragraph 1</i>	Block 2, Paragraph 1	103	7.04	1.84	0.73	3.60	72.50
<i>Form A, Block 2, Paragraph 2</i>	Block 2, Paragraph 2	103	7.31	1.80	0.60	4.00	63.75
<i>Form A, Block 2, Paragraph 3</i>	Block 2, Paragraph 3	103	6.98	1.59	0.61	3.60	70.00



NEW FORM B							
Consecutive Exam							
<i>Original</i>	<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Item total Correlation</b>	<b>Average Relevance Rating</b>	<b>Average Angoff Rating</b>
<i>B 11</i>	Item 1	100	10.20	3.94	0.81	2.40	48.00
<i>A 10</i>	Item 2	103	15.28	3.94	0.75	1.80	82.50
<i>B 1</i>	Item 3	100	14.68	3.66	0.65	3.40	73.00
<i>B 2</i>	Item 4	100	13.33	3.20	0.52	1.40	80.00
<i>B 3</i>	Item 5	100	13.28	4.24	0.62	1.80	87.00
<i>B 5</i>	Item 6	100	13.72	3.52	0.70	4.00	65.00
<i>B 6</i>	Item 7	100	13.45	3.50	0.68	3.20	85.00
<i>B 7</i>	Item 8	100	13.93	4.43	0.80	3.60	78.00
<i>B 8</i>	Item 9	100	12.58	4.47	0.80	4.00	76.00
<i>B 9</i>	Item 10	100	16.31	3.94	0.81	4.00	72.00
<i>B 10</i>	Item 11	100	14.07	3.69	0.81	2.20	81.00
<i>B 15</i>	Item 12	100	14.62	3.77	0.56	1.40	68.00

Table I3: New Form C

NEW FORM C							
Sight Exam							
<i>Original</i>	<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Item total Correlation</b>	<b>Average Relevance Rating</b>	<b>Average Angoff Rating</b>
<i>Form C, Block 1, Paragraph 1</i>	Block 1, Paragraph 1	100	5.85	2.41	0.91	4.00	58.00
<i>Form C, Block 1, Paragraph 2</i>	Block 1, Paragraph 2	100	5.25	2.38	0.89	2.80	49.00
<i>Form C, Block 1, Paragraph 3</i>	Block 1, Paragraph 3	100	5.54	2.50	0.90	3.20	51.00
<i>Form A, Block 2, Paragraph 1</i>	Block 2, Paragraph 1	103	7.04	1.84	0.73	3.60	72.50
<i>Form A, Block 2, Paragraph 2</i>	Block 2, Paragraph 2	103	7.31	1.80	0.60	4.00	63.75
<i>Form A, Block 2, Paragraph 3</i>	Block 2, Paragraph 3	103	6.98	1.59	0.61	3.60	70.00

NEW FORM C							
Consecutive Exam							
<i>Original</i>	<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Item total Correlation</b>	<b>Average Relevance Rating</b>	<b>Average Angoff Rating</b>
<i>C 2</i>	Item 1	100	11.06	4.26	0.91	2.60	73.00
<i>C 5</i>	Item 2	100	10.98	4.18	0.89	3.40	56.00
<i>C 11</i>	Item 3	100	11.75	3.98	0.89	3.20	83.00
<i>A 6</i>	Item 4	103	16.86	3.36	0.74	2.80	80.00
<i>A 7</i>	Item 5	103	15.99	3.45	0.77	3.20	78.75
<i>B 9</i>	Item 6	100	16.31	3.94	0.81	4.00	72.00
<i>B 1</i>	Item 7	100	14.68	3.66	0.65	3.40	73.00
<i>A 9</i>	Item 8	103	15.24	3.89	0.76	2.40	78.75
<i>A 13</i>	Item 9	103	14.23	3.85	0.67	2.00	81.25
<i>A 12</i>	Item 10	103	15.06	4.09	0.84	2.80	75.00
<i>A 4</i>	Item 11	103	11.54	3.90	0.79	3.80	67.50
<i>C 8</i>	Item 12	100	10.86	3.88	0.88	3.00	84.00