NATIONAL BOARD OF MEDICAL EXAMINERS®
INTERNATIONAL FOUNDATIONS OF MEDICINE® (IFOM®)
2019 BASIC SCIENCE EXAMINATION
Interpretation Guidelines for Medical Schools and Organizations

The 2019 IFOM Basic Science Examination
The International Foundations of Medicine® (IFOM®) Basic Science Examination (BSE) measures competency in the fundamental sciences relevant to the practice of medicine internationally. The emphasis is on the principles and mechanisms underlying health, disease and modes of therapy. Test material is designed to measure application of basic science knowledge in a clinical context.

IFOM BSE Scores
The IFOM BSE score is an equated percent correct score that represents mastery of the content domain assessed by the examination. It is calculated as the percentage of items in the total content domain that would be answered correctly based on an examinee's proficiency level. Scores are placed on a classic percent correct metric (0-100%) to facilitate interpretation and use. This scale can easily be incorporated into grading schemes. IFOM BSE scores are equated across test administrations and are statistically adjusted for variations in test form difficulty. Consequently, these scores can be used to compare and track school and examinee performance over time.

The 2019 IFOM BSE is administered in both paper-and-pencil and web formats and is offered in Spanish and International English. Caution should be used in the interpretation of scores as the modality and language of the test administration may affect performance for some examinees.

Precision of Scores
Measurement error is present on all tests, and the standard error of measurement (SEM) provides an index of the imprecision of scores. The SEM is approximately 5 points for the IFOM BSE. Using the SEM, it is possible to calculate a score interval that indicates how much a score might vary across repeated testing using different sets of items covering similar content. An interval expected to encompass about two thirds of scores observed on repeated testing may be found by adding and subtracting the SEM from the reported score.

The standard error of difference (SED) in scores is an index used to assess whether the difference between two scores is statistically meaningful. The SED is approximately 7 scale score points for IFOM BSE. If the scores received by two examinees differ by at least one SED, it is unlikely that the examinees are equal in proficiency, since a difference this large would occur by chance less than 32% of the time.

Interpreting IFOM BSE Scores
The IFOM BSE is used for a variety of purposes by both individuals and institutions. Individuals use IFOM BSE for several purposes, including participation in exchange programs, application for post-graduate training programs and professional positions, and self-assessment relative to international standards. Medical schools use IFOM BSE for formative and summative assessment, curriculum evaluation and international benchmarking. Post-graduate programs use IFOM BSE for selection of graduates for training. Ministries of health/education use IFOM BSE as part of assessment for regional certification.

As implied based on the variety of uses of IFOM BSE, it may be utilized for both high-stakes and low-stakes assessment purposes. The stakes for the examinee taking the IFOM BSE as well as differences in educational level, preparation and motivation may affect performance.   These factors should be considered when interpreting performance and when comparing performance based on one use of IFOM BSE to performance based on a different use. These factors should also be considered when interpreting IFOM performance relative to Step 1 performance and the Step 1 minimum passing score. Step 1 is a very high-stakes examination that is taken after intense preparation. While the IFOM BSE

score of 77 that corresponds approximately to the Step 1 minimum passing score is useful as a benchmark, stakes and preparation for IFOM BSE examinees may differ substantially and should be taken into consideration when making comparisons.

International Comparison Group (ICG)
The International Comparison Group (ICG) included 3,518 examinees from the Americas (25.4%), Asia including the Middle East (44.0%), Europe (13.8%) and Oceania (16.7%) who took the IFOM BSE in 2015-2018. The mean score of the IFOM BSE ICG was 54 and the standard deviation was 17 points. As mentioned in the previous section, IFOM BSE is utilized for a variety of assessment purposes and the stakes as well as differences in educational level, preparation and motivation may affect performance. These factors should be considered when interpreting performance relative to the ICG as most ICG examinees tested for formative or summative purposes in a low stakes context.

Examination Feedback
Each examinee is provided with a Performance Report showing the total test equated percent correct score and a Performance Profile displaying individual strengths and weaknesses for major content areas.

Norm Table
The norm table below may be used to compare a score on the 2019 IFOM BSE with the performance of the International Comparison Group (ICG). To determine the percentile rank in this group, locate the score in the column labeled Total Test Equated Percent Correct Score. The number that is located in the adjacent column labeled Percentile Rank indicates the percentage of participants in the ICG scoring lower than that score. Caution should be used in interpreting performance relative to this group due to differences in examinee preparation and motivation.

Norm Table Based on the IFOM BSE International Comparison Group

Total Test Equated Percent Correct Score	Percentile Rank	Total Test Equated Percent Correct Score	Percentile Rank	Total Test Equated Percent Correct Score	Percentile Rank	Total Test Equated Percent Correct Score	Percentile Rank
100	100	80	93	60	64	40	21
99	100	79	92	59	62	39	20
98	100	78	91	58	61	38	18
97	100	77	90	57	58	37	16
96	100	76	89	56	57	36	15
95	100	75	88	55	54	35	13
94	100	74	86	54	51	34	12
93	99	73	85	53	49	33	10
92	99	72	84	52	47	32	9
91	99	71	83	51	45	31	8
90	98	70	81	50	42	30	7
89	98	69	80	49	41	29	6
88	97	68	78	48	38	28	5
87	97	67	76	47	36	27	4
86	96	66	74	46	33	26	3
85	96	65	73	45	31	25	3
84	96	64	71	44	29	24	2
83	95	63	70	43	28	23	2
82	95	62	68	42	26	22	2
81	94	61	66	41	24	21 and below	1

Approximate Correspondence with USMLE Step 1 Performance

The IFOM BSE is intended to determine an examinee's relative areas of strength and weakness in general areas of basic science, not to predict performance on the USMLE Step 1 examination, and the content covered by the two examinations is somewhat different. However, because there is substantial overlap in content coverage and many IFOM items were previously used on USMLE Step 1, it is possible to roughly project IFOM performance onto the USMLE Step 1 score scale. The table below provides this information.

To use the table, locate an IFOM score in the associated column and look up the corresponding entry in the column labeled Step 1 Scale. For example, if an examinee's score is 54, the corresponding entry of 140 indicates that the examinee's performance on the 2019 IFOM BSE corresponds approximately to a Step 1 score of 140. The IFOM BSE score is not the same as, and cannot be used in place of, a USMLE Step 1 score.

Approximate Correspondence of IFOM BSE And USMLE Step 1 Scores							
IFOM Score	Step 1 Scale	IFOM Score	Step 1 Scale	IFOM Score	Step 1 Scale	IFOM Score	Step 1 Scale
100	274	79	199	58	147	37	108
99	271	78	197	57	146	36	106
98	268	77	194	56	143	35	105
97	266	76	191	55	142	34	103
96	255	75	188	54	140	33	101
95	252	74	185	53	138	32	100
94	250	73	182	52	136	31	98
93	246	72	180	51	134	30	96
92	242	71	178	50	132	29	95
91	238	70	176	49	130	28	93
90	234	69	173	48	128	27	92
89	231	68	170	47	126	26	90
88	228	67	168	46	123	25	89
87	223	66	166	45	122	24	87
86	220	65	163	44	121	23	86
85	217	64	161	43	119	22	85
84	215	63	159	42	117	21	83
83	211	62	157	41	115	20	81
82	208	61	154	40	113		
81	205	60	151	39	111		
80	202	59	150	38	110		

Mean Performance of examinees from U.S. and Canadian medical schools taking USMLE Step 1 for the first time in 2017 is 229.

The Step 1 Minimum Passing Score as of 1/1/2019 is 194.

Interpretation of Box Plots on Group Performance Report and Performance Summary Profile (If Ordered)

- The "box" represents the middle 50% of all observed scores;
- The upper boundary of the box indicates the 75th percentile of the score distribution, the lower boundary indicates the 25th percentile; the box is referred to as the inter-quartile range (IQR);
- The line in the box indicates the median, or the 50th percentile of the distribution;
- The ends of the lines extending from the box, or "whiskers," represent the highest and lowest values that are not more than 1.5 x the IQR interval from either end of the box.

Guidelines for the use of IFOM BSE Scores for Decisions

When comparing student performance, it is generally appropriate to consider IFOM BSE results in conjunction with other criteria such as grades, rather than using test scores as the sole basis for decisions. Test scores should be viewed as approximate, not exact, measures of medical knowledge; consequently, small differences in IFOM BSE scores alone should not be used as the basis for decisions about students.

Score Equivalency Table

This table is intended to aid in your transition to the new IFOM Basic Science Examination (BSE) score scale. The new score is an equated percent correct score that represents mastery of the content domain assessed by the examination. It is calculated as the percentage of items in the content domain that would be answered correctly based on an examinee's proficiency level. The IFOM BSE scores are placed on a classic percent correct metric (0 – 100%) to facilitate interpretation and use.

The table below provides approximate performance equivalents from the old standard score to the new equated percent correct score. To use the table, locate an examinee's score in the column labeled "Old Standard Score" and look across to the column labeled "Equated Percent Correct Equivalent". This number indicates the equivalent equated percent correct score.

Approximate IFOM BSE Standard Score to Equated Percent Correct Score Equivalency Table					
Old Standard Score	Equated Percent Correct Equivalent	Old Standard Score	Equated Percent Correct Equivalent	Old Standard Score	Equated Percent Correct Equivalent
800	97	590	76	380	48
790	94	580	75	370	46
780	93	570	74	360	44
770	93	560	72	350	43
760	92	550	71	340	42
750	91	540	70	330	40
740	90	530	69	320	38
730	89	520	68	310	37
720	88	510	66	300	35
710	88	500	65	290	33
700	87	490	64	280	31
690	86	480	62	270	29
680	85	470	61	260	27
670	84	460	60	250	25
660	83	450	58	240	23
650	82	440	57	230	21
640	81	430	55	220	19
630	80	420	54	210	17
620	79	410	52	200	7
610	78	400	51		
600	77	390	49		