Technical Report
NBVME Qualifying Examination
September 2013, January 2014, and May 2014 Test Administrations

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I. Introduction

The primary objective of the NBVME's Qualifying Examination (QE) is to provide a comprehensive objective examination in basic veterinary medical sciences for use by the Program for the Assessment of Veterinary Education Equivalence (PAVE) of the American Association of Veterinary State Boards in evaluating the education equivalence of veterinarians who are graduates of veterinary schools not accredited by the Council on Education of the American Veterinary Medical Association. The examination is also offered to accredited schools for use as an assessment of basic science knowledge. In addressing this objective, the QE also protects the public by ensuring that veterinarians demonstrate a specified level of knowledge and skills before entering veterinary practice, and provides a common standard in the evaluation of candidates that will be comparable from jurisdiction to jurisdiction.

II. Test Development

Qualifying Examination test development is done by the NBVME in cooperation with the National Board of Medical Examiners (NBME). The blueprint for the examination provides the content area distribution of items and served as the basis for developing the 2013-2014 test forms. The 200 items on each form of the QE were assigned as follows: Anatomy (44), Physiology (45), Pharmacology (29), Microbiology (39), and Pathology (43).

Members of the QE Examination Committee, listed in **Appendix A,** reviewed items selected for use on the examination forms by content area. A final review of the complete forms was conducted by the NBVME Executive Director before they were finalized.

The September 2013 form of the QE contained 99 new/unused items and and 101 used items. The January 2014 form contained 98 new/unused items and 102 used items. The May 2014 form of the QE was reused from January 2013.

III. Test Administration

A. Examination Summary

September 12, 2013: The QE was administered to 18 PAVE candidates at nine test sites, including: California, Hawaii, Michigan, New Jersey, Pennsylvania, Utah, Grand Cayman, England, and South Korea. It was also administered to 116 students at the University of Missouri.

January 16, 2014: The QE was administered to nine PAVE candidates at 7 test sites, including: California, Florida, Hawaii, Illinois, Tennessee, Washington, and Grand Cayman. It was also administered to 146 students at Iowa State University.

May 15, 2014: The QE was administered to 16 PAVE candidates at eight sites, including: California (two sites), Hawaii, Indiana, Oklahoma, Texas, Grand Cayman, and South Korea. It was also administered to 130 students at Ross University in St. Kitts.

B. Post-Test Survey

Examinees were asked to complete an optional post-test survey after completing the examination. Results of the survey for each administration were provided to the NBME and the NBVME.

C. Key Validation

When all responses for the examination were received and loaded to the NBME database, examinees' item responses were scored. An item analysis based on the responses of all examinees testing without accommodation for each administration was performed to statistically identify items on the examination with potential defects. Following the September and January administrations, identified items were reviewed during a conference call with members of the Examination Committee, the NBVME Executive Director, and NBME staff, to ensure that the items were correctly keyed and free of content or structural defects.

IV. Scoring and Analysis

A. Summary Statistics

Summary statistics for all forms of the QE administered since September 2006 are provided in Table 1.

The mean item difficulty (p-value) is a measure of the average difficulty of the items on the examination. Both the difficulty of the items and the proficiency of the candidates influence mean p-values; therefore, they cannot be compared meaningfully across administrations. However, mean p-values can be used to compare the average difficulty of the items in different content categories within each administration.

The mean item discrimination index (Rbis) is an indication of how well, on average, items on the examination discriminated between candidates who obtained high scores and candidates who obtained low scores. Item discrimination is measured by the item-total corrected biserial correlation coefficient.

The reliability coefficient refers to a score's expected consistency. An examination score is reliable to the extent that administration of a different random sample of items from the same content domain would result in little or no change in a candidate's rank order in the group. Reliability is affected by the homogeneity of the items and the candidates, as well as by the length of the examination.

B. Examinee Performance

Starting with the September 2008 administration, the QE scores were placed on a fixed reference scale. This scale was based on the performance of all candidates who took the QE for the first time under standard conditions beginning with the September 2005 administration through the May 2008 administration. Scores of administrations from September 2008 through January 2011 were equated and placed on the reference scale.

A content-based standard setting study was conducted at the NBME in 2008. After reviewing the results of the study, the NBVME set a minimum passing score (MPS) on the new equated scale of .07 logits. This MPS was translated into a reported score of 203.

Due to the small number of candidates for the May 2011 and subsequent administrations, these administrations were not equated. Scores were calculated such that the minimum passing raw score was equivalent to a scale score of 203.

Table 2 provides the history of failure rates on QE forms administered since September 2006.

C. Score Reporting

A sample PAVE score report and a sample diagnostic report are included in **Appendix B**.

V. Future of the Qualifying Examination

In August 2013, the American Association of Veterinary State Boards notified the NBVME that it did not wish to continue to use the QE as part of the PAVE program after the May 2014 test administration.

The NBVME has worked with the NBME to develop one 200-item form of the QE per year, and will offer that form to veterinary schools as an independent, standardized assessment of basic science knowledge, beginning in September 2014.

Table 1
Summary Statistics

Administration	N	Number of Items Scored (Deleted)	Mean p-Value (Standard Deviation)	Mean Discrimination Index: Rbis (Standard Deviation)	Reliability Coefficient
September 2006	77	278 (22)	.56 (.21)	.17 (.15)	.90
January 2007	56	277 (23)	.60 (.21)	.17 (.15)	.90
May 2007	87	276 (24)	.60 (.22)	.18 (.13)	.91
September 2007	105	288 (12)	.58 (.18)	.20 (.13)	.93
January 2008	114	285 (15)	.58 (.19)	.21 (.14)	.93
May 2008	84	284 (16)	.60 (.22)	.15 (.12)	.88
September 2008	87	290 (10)	.59 (.19)	.22 (.13)	.94
January 2009	119	294 (6)	.61 (.18)	.20 (.12)	.93
May 2009	109	288 (12)	.59 (.20)	.20 (.14)	.93
September 2009	132	288 (12)	.64 (.19)	.27 (.18)	.92
January 2010	132	287 (13)	.62 (.19)	.29 (.17)	.93
May 2010	112	285 (15)	.65 (.20)	.32 (.18)	.94
September 2010	176	266 (34)	.64 (.18)	.30 (.16)	.93
January 2011	149	275 (25)	.63 (.18)	.28 (.16)	.93
May 2011	39	265 (35)	.57 (.19)	.21 (.21)	.89
September 2011	44	280 (20)	.59	.26	.90
January 2012	19	280 (20)	.57	.27	.93
May 2012	30	280 (20)	.58	.23	.90
September 2012	24	280 (20)	.53	.28	.93
January 2013	30	183 (17)	.63	.32	.91
May 2013	33	187 (13)	.59	.23	.87
September 2013	18	188 (12)	.58	.24	.87
January 2014	9	179 (21)	.58	.25	.87
May 2014	16	183 (17)	.61	.26	.88

Candidates who receive test accommodations for a documented disability are given extra time to complete the examination. For security purposes, they are administered a different form of the examination. These candidates are excluded from all summary statistics in this table. Summary statistics prior to May 2011 are based on the reference group (PAVE candidates taking the examination for the first time under standard conditions). Data from May 2011 on are based on the total PAVE group.

Table 2
History of Failure Rates

	Total Group		Reference Group	
Administration	**N**	**Failure Rate**	**N**	**Failure Rate**
September 2006	25/90	27.8%	16/77	20.8%
January 2007	19/65	29.2%	13/56	23.2%
May 2007	38/100	38.0%	27/87	31.0%
September 2007	49/129	38.0%	35/105	33.3%
January 2008	52/148	35.1%	37/114	32.5%
May 2008	45/117	38.5%	19/84	22.6%
September 2008	41/124	33.1%	25/87	28.7%
January 2009	57/146	39.0%	36/119	30.3%
May 2009	43/154	27.9%	23/109	21.1%
September 2009	45/167	26.9%	27/132	20.5%
January 2010	39/166	23.5%	23/132	17.4%
May 2010	36/134	26.9%	21/112	18.8%
September 2010	59/204	28.9%	43/176	24.4%
January 2011	63/200	31.5%	31/149	20.8%
May 2011	15/39	38.5%	-	-
September 2011	15/44	34.1%	-	-
January 2012	10/19	52.6%	-	-
May 2012	17/30	56.7%	-	-
September 2012	14/24	58.3%	-	-
January 2013	16/30	53.3%	-	-
May 2013	12/33	36.4%	-	-
September 2013	8/18	44.4%	-	-
January 2014	7/9	77.8%	-	-
May 2014	7/16	43.8%	-	-

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Appendix A
2013-2014 Qualifying Examination Committee

Dr. Dan Brown, Bacteriology
University of Florida College of Veterinary Medicine, Gainesville, FL

Dr. Hari Goyal, Histology
Tuskegee University School of Veterinary Medicine, Tuskegee, AL

Dr. Sagar Goyal, Virology
University of Minnesota College of Veterinary Medicine, St. Paul, MN

Dr. James Herman, Physiology
Texas A&M University College of Veterinary Medicine, College Station, TX

Dr. Nongnuch Inpanbutr, Anatomy
Ohio State University College of Veterinary Medicine, Columbus, OH

Dr. Karen Russell, Clinical Pathology
Texas A&M University College of Veterinary Medicine, College Station, TX

Dr. Wayne Schwark, Pharmacology
Cornell University College of Veterinary Medicine, Ithaca, NY

Dr. Frederick Tippett, Pathology
Tuskegee University School of Veterinary Medicine, Tuskegee, AL