

American Chiropractic Neurology Board (ACNB)

Diplomate of the American Chiropractic Neurology
Board (DACNB) Job Analysis Study Report

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SUMMARY ACNB 2019 JOB ANALYSIS
(SURVEY ITEM TABLES NOT INCLUDED)

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Introduction

In 2014, the American Chiropractic Neurology Board (ACNB) completed a job (practice) analysis study for the development and implementation of a practice-based certification examination for the Diplomate of the American Chiropractic Neurology Board (DACNB). The study resulted in the identification of the major areas of practice (i.e., work activities) in chiropractic functional neurology, and the content domains related to the chiropractic functional neurology evaluation of the central nervous system regions of integration and modulation of function (i.e., the knowledge, skills, and abilities applied in the performance of the work activities). This information was used to develop a content outline (i.e., work activities and content domains) and test specifications for the certification examination. The content outline and test specifications have been used for the development of the examination since 2014. In keeping with ACNB's policy to conduct a job analysis every five (5) years to ensure that the content outline and test specifications for the examination reflects current, best practice in chiropractic functional neurology, in 2017, the ACNB initiated a job analysis study. The ACNB retained the services of Dr. Tina Freilicher of Shoreline Psychometric Services, LLC. for assistance in the conduct of the job analysis study (referred to as the "consultant" in this report). Dr. Tina Freilicher, who is psychometrician, facilitated the meetings, analyzed the job analysis data, and prepared this report. See Appendix A for a description of Dr. Freilicher's qualifications.

This report describes the study's methodology, summarizes data, and presents the results of the study, i.e. a draft content outline and preliminary test specifications that were reviewed and finalized by the ACNB.

Methodology

Rationale for the Methodology

Job (practice) analysis methodologies including both empirical and logical were considered. Although the two methodologies differ in many ways, a critical difference is that empirical practice analyses are essentially survey-based and depend on a broad sampling of practitioners. Logical job analyses are focus group-based and depend on the pooled judgments of a representative committee of subject-matter experts (SMEs). It is, in essence, a "brainstorming" process that proceeds until consensus is reached on each point under investigation or discussion. One of the more formal names for the brainstorming employed in the context of job analysis is "role delineation." The purpose of role delineation, as a job task analysis technique, is to develop practice-based test specifications for the certification-level professional. It achieves this goal by identifying the major and specific work activities (tasks) that define the profession along with the knowledge required of the certification-level candidate (i.e., content domains).

A combination of the logical and empirical practice analysis methodologies was chosen for the following reasons:

- 1) The availability of sufficient qualified SMEs from which to select a focus group committee (i.e., the job analysis committee).
- 2) Using a combination of these data collection methodologies will complement each approach, as the logical approach will contribute to the development of a content outline that would be validated by a larger sample of the population.

The procedure used involved a number of steps including:

1. Review of the work activities.
2. Refinement and/or development of the task statements associated with the work activities.
3. Review of the content domains.
4. Refinement and/or development of knowledge, ability and/or skill statements associated with the content domains.
5. Validation of content outline by surveying the population of DACNBs.
6. Using the data from the validation survey to finalize the content outline (i.e., work activities and content domains) and to produce preliminary test specifications.
7. Review and finalization of the test specifications.

The following is a brief outline of each of the steps as employed in this job (practice) analysis:

1. The major work activities were reviewed for the purpose of determining whether they reflect current practice, and if any work activities were missing from the 2014 content outline (i.e., work activities and content domains). These are the principal areas of responsibility or activities that comprise the practice of DACNBs. They are the major headings in the outline format of the test specifications document.
2. After the review of work activities, the next step was to review the tasks associated with each work activity to determine whether they reflect current practice, and if any tasks were missing from the 2014 content outline. A task is defined as a specific, goal-directed activity or set of activities having a common objective or type of output. The set of tasks for each work activity was delineated in such a manner as to be exhaustive and mutually exclusive and cover all aspects of the profession relevant to the objectives of the job task analysis (i.e., the development of practice-based test specifications). The committee used some information from the content domains to develop and/or refine task statements.
3. The committee prepared the finalized work activities and tasks while ensuring clarity of meaning and comprehensiveness.
4. The committee reviewed the content domains associated with the performance of each task to determine whether they reflect the knowledge, skills and abilities (KSAs) necessary for current practice.
5. The committee prepared the finalized content domains and KSAs associated with the content domains while ensuring clarity of meaning and comprehensiveness.
6. A survey of the content outline was then disseminated to the population of DACNBs. Using an importance validity rating scale and an indication of the percentage of time spent performing tasks in the major work activities, as well as the application of importance and frequency validity rating scales for the task statements, content domains and KSAs, the survey respondents' ratings were used to derive a set of weights for the draft test specifications. Qualitative data were collected and included as part of the survey results for review by the committee.
7. The committee used the results of the job analysis survey to finalize the content outline (i.e., work activities and content domains) and test specifications.

Role of the Job Analysis Committee

As the first step, the ACNB convened a representative committee of subject matter experts (i.e., the job analysis committee) in the practice of chiropractic neurology for the development of the job analysis. Their role in the study was to review and update the current content outline, which describes the major work activities, the tasks associated with the work activities, the content domains, and the KSAs associated with the content domains that are necessary to perform the tasks. The committee also reviewed and/or developed questions for the survey, reviewed the survey instrument, participated in a pilot of the survey, and used the data resulting from the study to finalize the content outline and test specifications. All committee members hold the DACNB credential and are from various geographical locations. The majority are chiropractors with a private practice specializing in the rehabilitation of neurological disorders. Their years of work experience range from 4 years to 39 years. See Table 1 below for the committee roster, as it indicates committee members' names, current position/title, current job function, type of work setting, location, years of experience and credentials.

Table 1. Job Analysis Committee Members (continued on next page)

Job Analysis Study Committee Members' Demographic and Background Information						
Name	Current Position, Title	Current Job Function	Work Setting	Location (City, State, Country)	Yrs. of Experience	Credential(s) and/or Education
Dr. Gail Henry	ACNB VP	Chiropractor specializing in rehabilitation of neurological disorders	Private Practice	Houston, TX, USA	39	DC, DABCN, DACNB, FACFN
Dr. Mike Swank	CAGAN President	Chiropractor specializing in rehabilitation of neurological disorders	Private Practice	Dover, PA, USA	36	DC, DABCN, DACNB
Dr. Marty Hall		Associate Professor Parker College of Chiropractic	Faculty/Professor Parker College of Chiropractic	Dallas, TX, USA	35	DC, DACNB, FACFN
Dr. Candace Duty		Chiropractor specializing in rehabilitation of neurological disorders	Private Practice	Chesapeake, Ohio, USA	34	DC, DACAN, DACNB
Dr. Mike Abbatinuzzi		Associate Professor Life Chiropractic College	Faculty/Associate Professor Life Chiropractic College	Marietta, GA, USA	30	DC, DACNB, FACFN, FABVR, FABBIR
Dr. Linda Mullin Elkins		Associate Professor Life Chiropractic College	Faculty/Associate Professor Life Chiropractic College	Marietta, GA, USA	27	DC, DACNB
Dr. John Brown		Chiropractor specializing in rehabilitation of neurological disorders	Private Practice	Foley, AL, USA	25	DC, DACNB
Dr. Julia Allen Carleton	Past ACNB Secretary	Chiropractor specializing in rehabilitation of neurological disorders	Private Practice	Georgetown, TX, USA	24	DC, DACNB
Dr. Jay Hobbs		Chiropractor specializing in rehabilitation of neurological disorders	Private Practice	Visalia, CA, USA	24	DC, DACNB
Dr. David Clark		Chiropractor specializing in rehabilitation of neurological disorders	Private Practice	Durham, NC, USA	17	DC, DACNB, FACFN, FABVR, FABBIR
Dr. Michael Posey		Chiropractor specializing in rehabilitation	Private Practice	Abilene, TX, USA	15	DC, DACNB

Job Analysis Study Committee Members' Demographic and Background Information						
Name	Current Position, Title	Current Job Function	Work Setting	Location (City, State, Country)	Yrs. of Experience	Credential(s) and/or Education
		of neurological disorders				
Dr. Amber Genetzky		Chiropractor specializing in rehabilitation of neurological disorders	Private Practice	Eagan, MN, USA	12	DC, DACNB
Dr. Annie Albertin		Chiropractor specializing in rehabilitation of neurological disorders	Private Practice	Waxhaw, NC, USA	8	DC, DACNB, FABBIR
Dr. Michael Teytelbaum		Chiropractor specializing in rehabilitation of neurological disorders	Private Practice	Short Hills, NJ, USA	8	DC, DACNB
Dr. Rachel Klein		Chiropractor specializing in rehabilitation of neurological disorders	Private Practice	Hilo, HI, USA	7	ND, DC, DACNB, FIBFN-CNDH
Dr. David Hardy		Chiropractor specializing in rehabilitation of neurological disorders	Private Practice	Red Deer, AB, Canada	6	DC, DACNB, FABBIR
Dr. Justin Diphillippo		Chiropractor specializing in rehabilitation of neurological disorders	Private Practice	Pottstown, PA, USA	4	DC, DACNB
Dr. Michael Lovich		Chiropractor specializing in rehabilitation of neurological disorders	Private Practice	Newton Centre, MA, USA	4	DC, DACNB
Dr. James Munse		Chiropractor specializing in rehabilitation of neurological disorders	Private Practice	Chantilly, VA, USA	4	DC, DACNB
Dr. Joel Schwartz		Chiropractor specializing in rehabilitation of neurological disorders	Private Practice	Monroe Township, NJ, USA	25	DC, DACNB

Development of the Job Analysis

In preparation for a review of the 2014 content outline (i.e., work activities and content domains) by the job analysis committee, in April 2017, the consultant conducted an initial review of the content outline and noted that the work activities and content domains included a mixture of task and knowledge statements, partially developed task statements, coupled with extensive lists of terms and phrases representing various topics associated with the work activities and content domains. Given the structure of some of the phrases and listings of terms, it appeared that the content domains may include information that could be used to refine and/or develop task statements for the work

activities. The 2014 job analysis report indicated that more than 20 surveys were administered to validate the content outline. It was recommended, at the most, no more than two surveys (i.e., a survey to collect validity data on the work activities, and a survey to collect validity data on the content domains) be administered for the job analysis study. Therefore, it was recommended, to the extent possible, that the lists of terms and phrases be consolidated into applicable task and/or KSA statements so that the surveys could be completed within a reasonable length of time by the survey respondents, and to enhance the response rate. These observations and recommendations were shared with the ACNB and the job analysis committee for their review and consideration in the development and administration of the job analysis. In addition, working with ACNB, the consultant also drafted demographic/background questions, validity rating scales, questions addressing eligibility and continuing education requirements for the job analysis survey instrument. This information was also shared with the job analysis committee for their review.

A series of web-based meetings from May 2017 through May 2018 were held with the job analysis committee to review and refine the work activities and content domains. The first web-based meeting was held on May 17, 2017 to orient the job analysis committee to the job analysis process and their role in the process. The committee was provided with a copy of the existing content outline with notes indicating areas that may be consolidated or used for the development of task and/or knowledge statements, and training and instruction on how to develop task and knowledge statements. The subsequent web-based meetings involved a systematic review of all components of the work activities and content domains. The committee members were provided with instructions and worksheets for homework assignments that were to be completed in advance of designated web-based meetings. Components of the work activities and content domains were assigned as homework to one or more committee members. The committee members' revised task and/or knowledge statements (i.e., homework) were added to a "master" document (i.e., the content outline showing all committee members' comments and suggested revisions) and was shared with the committee during the web conferences. The web conferences were facilitated by the consultant and ACNB. The web conferences resulted in revising the content outline to clarify task and knowledge statements, develop new statements, consolidate information, and to remove redundancies. See Table 2 for the dates of the web-based conferences, and a listing of the activities performed during the web-based conferences. See Appendices B – J for instructions, worksheets, and homework assignments.

Table 2. List of Activities Performed to Review and Update the Content Outline

	Date	Activity
1	May 17, 2017	Orientation to job analysis study.
2	June 20, 2017	Completed review of work activities sections 1.1 – 2.6 and identified remaining areas that required additional task statements and/or the development of task statements using information from the content domains. <ul style="list-style-type: none"> • See Appendix B for the agenda. • See Appendix C for the homework assignment instructions to develop tasks and knowledge statements to address areas identified during the June 20, 2017 web-based meeting. • See Appendix D for the worksheet used for the homework assignment. • See Appendix E for homework assignments.
4	July 6, 2017	Continued review of work activities/tasks and knowledge statements using information from the June 2017 homework assignment. See Appendix I for draft content outline
5	July 17, 2017	Completed review of task and knowledge statements related to neuron theory, cerebellum, basal ganglia, and brain stem. <ul style="list-style-type: none"> • See Appendix F for homework assignments to develop knowledge statements. • See Appendix G for worksheet used for the homework assignment. • See Appendix H for homework assignments.
6	August 1, 2017	Completed review of task and knowledge statements related receptor systems, reflexogenic systems, autonomic nervous system, limbic system, lobes of the brain.
7	August 17, 2017	Completed review of task and knowledge statements related peripheral nerves, spinal cord, head and face pain, and brain and its environment.
8	March 21, 2018	Planning meeting with the ACNB
9	April 10, 2018	Completed review of task and knowledge statements related cranial nerves, neuro-endocrine system, and pain.
10	May 8, 2018	Reviewed knowledge statements associated with the content domains, and completed review of draft document. <ul style="list-style-type: none"> • See Appendix J for homework assignment instructions.

The committee retained the major work activities and the majority of the content domains from the 2014 job analysis. However, “ethics” and “red flags” were removed as major content domains, as the committee believed such topics were associated with more than one task across different work activities, such as, for example, red flags would be associated with Special Studies. As indicated below, a total of 118 task statements were identified and distributed among the major work activities.

Table 3. Number of tasks per work activity

Work Activity	Number of Tasks
1. Take a Patient History	2
2. Perform a Physical Exam	85
3. Conduct or Order Special Studies	1
4. Identify Diagnosis(es), Differential Diagnosis(es), Disease Processes, Metabolic Rate, Pathways	16
5. Treatment and Rehabilitation	11
6. Referral	3
Total	118

As indicated in Table 4, two hundred (200) knowledge, skills, and/or ability statements (KSAs) were identified and aligned to the following 17 content domains. The validation section of the survey for the Content Domains consisted of 200 statements.

Table 4. Number of KSAs per content domain

Content Domains	Number of KSAs
1. Neuron theory	4
2. Receptor Systems	5
3. Peripheral Nerves	8
4. Spinal Cord	4
5. Brainstem	5
6. Cranial Nerves	25
7. Head and Face Pain	31
8. Cerebellar/Vestibular	4
9. Basal Ganglia	3
10. Reflexogenic Systems	6
11. Autonomic Nervous System	7
12. Limbic System	10
13. Lobes of the Brain	7
14. Brain and its Environment	16
15. Neuroendocrine System	8
16. Pain	39
17. Special Studies	18
Total	200

The following validity rating scales were reviewed and used to validate the major work activities (see Table 5), the task statements associated with the major work activities (see Table 6), the content domains (see Table 7), and the KSAs (see Table 8). The scales are designed to collect data on the importance of the work activities in the specialty practice of chiropractic functional neurology, the importance of the tasks performed in professional practice of the work activities, and the importance of the content domains and associated knowledge, skills and abilities for work in the specialty practice of chiropractic functional neurology. In addition to the importance validity ratings, survey respondents were asked to indicate the percentage of time spent performing tasks in each major work activity. For the task statements, survey respondents were also asked to apply a frequency validity rating scale to indicate the frequency in which tasks are performed in their professional practice of chiropractic functional neurology. For the

content domains and associated KSAs, survey respondents were also asked to apply a frequency rating scale to indicate the frequency in which the KSAs are used in practice.

Table 5. Validity Rating Scales for Work Activities

<p>Work Activities</p> <p>How important is this major work activity in your current chiropractic neurology practice?</p> <ul style="list-style-type: none"> 0) Not important 1) Somewhat important 2) Important 3) Very important <p>For each patient, approximately what percentage of time do you spend performing tasks in each of the following major work activities? (Enter whole numbers and do not include % signs.)</p>

Table 6. Validity Rating Scales for the Task Statements

<p>Task Statements</p> <p>How important is this task in your current practice in the area of chiropractic neurology?</p> <ul style="list-style-type: none"> 0) Not important 1) Somewhat important 2) Important 3) Very important <p>How frequently do you perform this task in your current practice in the area of chiropractic neurology?</p> <ul style="list-style-type: none"> 0) I do not perform this task 1) Once or twice per year 2) Quarterly 3) Monthly 4) Daily or Weekly
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Table 7. Validity Rating Scales for the Content Domains

<p>Content Domains</p> <p>The following content domains represent knowledge, skills, and abilities related to the practice of chiropractic neurology. Please indicate how important knowledge of each of the following content domains is to your practice of chiropractic neurology.</p> <ul style="list-style-type: none"> 0) Not important 1) Somewhat important 2) Important 3) Very important <p>Please indicate how frequently you use the knowledge, skill or ability of each content domain in your practice of chiropractic neurology.</p> <ul style="list-style-type: none"> 0) I do not use this knowledge 1) Once or twice per year 2) Quarterly 3) Monthly 4) Daily or Weekly
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Table 8. Validity rating scales for the KSAs

KSAs
How important is this knowledge, skill, and ability in your current practice of in the area of chiropractic neurology.
0) Not important
1) Somewhat important
2) Important
3) Very important
How frequently do you use this knowledge, skill or ability in your current practice in the area of chiropractic neurology.
0) I do not use this knowledge, skill or ability
1) Once or twice per year
2) Quarterly
3) Monthly
4) Daily or Weekly

As indicated previously, given the number of tasks associated with the work activities and KSAs associated with the content domains, two surveys were used for the job analysis study: 1) a survey to validate the work activities and 2) a survey to validate the content domains. Table 9 lists the types of questions that were common to both surveys, and the types of questions that were unique. The work activity survey included the tasks associated with the work activities, whereas, the tasks were not included in the content domain survey. The content domain survey included the KSAs, whereas, the KSAs were not included in the work activity survey. Since the examination program consists of a written examination and a practical examination, the surveys included questions to obtain data that would contribute to the development of test weights for both examinations.

The purpose of having common background questions is to assess the representativeness of the survey respondent group to the DACNB population but to also compare the comparability of the two surveys. The intent of the remaining common questions was to collect data from both surveys in the event that one of the surveys had a low response rate. However, since the response rates for both surveys were good (see section of the report describing the response rates), the data specific to work activities from the work activity survey and the data specific to the content domains from the content domain survey were used for making decisions about the content outline and test specifications.

Table 9. Components of the surveys

Work Activity Survey	Content Domain Survey
Background Questions	
Task Statements (Importance & Frequency Ratings, Questions concerning the representativeness of tasks of the specialty practice.)	KSAs (Importance & Frequency Ratings, Questions concerning the representativeness of the KSAs of the content domains for specialty practice.)
Work Activities Validity Ratings	
Content Domains Validity Ratings	
Weightings for the Written and Practical Examinations	
Activities Required to Achieve Competence as a DACNB (i.e., eligibility and recertification requirements)	

Pilot Testing the Survey

Following the May 22, 2018 web conference to finalize the content outline, the consultant provided the ACNB with a draft mock-up of the survey instrument that the ACNB would use to develop the survey in their survey software. The ACNB was responsible for creating and disseminating the survey. On June 22, 2018, the ACNB piloted the survey by disseminating it to the members of the job analysis committee. The purpose of the pilot was to assess survey respondents' ability to navigate through the survey, the clarity/comprehensiveness of instructions, the amount of time to complete the survey, and to obtain any final comments and/or suggested edits concerning the work

activities and content domains. The results of the pilot test did not result in altering the job analysis survey. The survey responses from the pilot test were included in the response rates and the analysis.

Survey Sampling Plan and Dissemination of the Survey

With the goal to have a fair representation of the population of DACNBs in response to both surveys, the work activity and the content domain surveys were disseminated to all 722 DACNBs. Therefore, each DACNB was identified as a potential recipient of both surveys. On June 28, 2018, the ACNB disseminated the surveys with the work activity survey first being sent to 722 individuals who held the DACNB. After disseminating the work activity survey, the ACNB determined that two of the email addresses used for the work activity survey were no longer valid for two individuals, so the two email addresses were removed prior to disseminating the content domain survey. Therefore, on June 28, 2018, the work activity survey was sent to 722 DACNBs and the content domain survey was sent to 720 of the 722 DACNBs.

To encourage participation in the surveys, the surveys included text that said that respondents could choose to indicate whether or not they wished to be included in a raffle after the survey was closed. Those who indicated that they wished to participate in the raffle qualified if they completed and submitted both surveys. The awards were sent out the week of March 7, 2019, three VISA gift cards for \$200 each and three certificates with \$186 each good for one annual re-certification fee. The winners were selected using an internally generated ID number for the eligible respondents. ACNB used a random number generator to make the selections of the winners.

In addition to offering a raffle as an incentive, a series of reminders were sent to non-respondents and to those who partially completed the surveys on the following dates: 7/2/2018, 7/9/2018, 7/16/2018 (work activity survey only), 7/18/2018 (content domain survey only), 7/23/2018, 7/30/2018, 8/6/2018, 8/14/2018, and 9/28/2018. The text in the reminder emails that accompanied the link to the surveys mentioned the raffle and encouraged participation by restating the value and number of the raffle prizes and appealing to participants' desire to share their knowledge of the profession by assisting in a job analysis study that would contribute to the creation of a certification exam that reflected current information and topic areas. The survey was closed on October 30, 2018. The ACNB exported the survey data in Excel files and provided the files to Shoreline Psychometric Services, LLC. for analysis, the results of which can be found below.

Results

This section of the report presents the results of the background and demographic survey questions, and the results of the validation ratings of the major domains, tasks, and knowledge statements. Survey respondents' comments in response to open-ended questions and "Other, please specify" options to multiple-choice questions are presented "verbatim."

Survey response rates

Of the 722 individuals who were sent the work activity survey, there were six bounce backs and 29 survey recipients opted-out from taking the survey. Of the 573 survey recipients who opened the work activity survey, 280 or 48.87% responded, with a confidence interval of ± 4.19 at a 95% confidence level. The survey respondents completed approximately 65.4% of the work activity survey. Of the 720 individuals who were sent the content domain survey, there were five bounce backs and 27 survey recipients opted-out from taking the survey. Of the 561 survey recipients who opened the survey, 230 or 41% responded with a ± 4.97 confidence interval at a 95% confidence level. The survey respondents completed approximately 66.1% of the content domain survey. The confidence intervals for the surveys are within acceptable ranges, as they are less than ± 5.00 . See Table 10 for these data.

Table 10. Survey response rates

	Work Activity Survey	Content Domain Survey
Number of Surveys Sent	722	720
Number of Bounce Backs	6*	5*
Number of Opt-Outs	29	27
Number of Opened Surveys	573	561
Total Number of Respondents	280	230
Response Rate*	48.87%	41.00%
Percentage of Completed Surveys	65.4%	66.1%
Confidence Interval at 95% confidence level	+/-4.19	+/-4.97

*The response rate was calculated by dividing the total number of respondents by the number of opened surveys.

**The reason for the difference in the number of bounce backs is that one of the invalid email addresses that ACNB eliminated between sending the work activity survey and the content domain survey was one of the email addresses that bounced when the work activity survey was sent.

Characteristics of the Survey Respondents

The background and demographic questions were designed to collect data about the survey respondents' credentials (i.e., certifications), years of experience, type of work setting, role, geographical location, and highest level of education, etc. Tables 11 – 28 present the results of the background and demographic questions for the work activity survey and content domain survey.

Table 11 indicates the number of survey respondents who hold, or ever held the Diplomate of the American Chiropractic Neurology Board (DACNB). The majority of survey respondents responded “Yes” to the question. When reviewing the table below, the ACNB indicated that all survey recipients held the credential; therefore, they believe that the two survey respondents who indicated “No” in response to the question may have inadvertently selected “No.”

Table 11. Type of Credentials

Are you now or have you ever been a Diplomate of the American Chiropractic Neurology Board (including DACNB, DABCN or DACAN)?				
Response	Work Activity Survey		Content Domain Survey	
	N	%	N	%
Yes	278	99.29%	228	99.13%
No	2	0.71%	2	0.87%
Total	280	100.00%	230	100.00%

Table 12 indicates the number of years holding ACNB certification and the distribution of responses among the ranges of years offered as choices to the survey question are well distributed. The highest number of responses was 3 to 5 years (i.e., approximately 31% to 26% on the work activity and content domain surveys, respectively), and the lowest number of responses was 16 to 20 years (i.e., approximately 6% to 7% on the work activity and content domain surveys, respectively). Since the same group of survey recipients responded to both surveys, the distribution of responses is comparable on the work activity survey and content domain survey.

Table 12. Number of Years Holding ACNB Certification

How many years have you held the certification from the ACNB?				
Response	Work Activity Survey		Content Domain Survey	
	N	%	N	%
Less than 1 year	22	7.94%	20	8.81%
1 to 2 years	29	10.47%	25	11.01%
3 to 5 years	86	31.05%	59	25.99%
6 to 10 years	44	15.88%	41	18.06%
11 to 15 years	41	14.80%	28	12.33%
16 to 20 years	18	6.50%	14	6.17%
More than 20 years	37	13.36%	40	17.62%
Total	277	100.00%	227	100.00%

Tables 13 through 16 present information about geographic location. The majority of survey respondents work in the U.S., as approximately 69% indicated that they work in the U.S. and 31% indicated that they work overseas (see Table 13). In the U.S., the number of survey respondents are distributed among all states on the work activity survey and the majority of states on the content domain survey (see Table 14). In terms of working overseas, as shown in Table 15, on the work activity survey, 80 respondents' responses were distributed among 14 different countries presented as choices, with the highest number of respondents indicating Canada (38.75%) and Australia (22.50%). On the content domain survey, 68 respondents' responses were distributed among 13 different countries with the highest number of respondents indicating Canada (35%) and Australia (21%). Table 15 lists the responses to "Other, please specify" as a response to the question asking that they select the country (i.e., not the U.S.) in which they work. It should be noted that the ACNB identified the countries listed as choices for the question based their knowledge of the population of DACNB.

Table 13. Work in the U.S.

Do you work in the United States of America?				
Response	Work Activity		Content Domain	
	N	%	N	%
Yes	191	68.95%	155	68.28%
No	86	31.05%	72	31.72%
Total		100.00%		100.00%

Table 14. State in which you work (continued on next page)

State	Work Activity Survey		Content Domain Survey	
	N	%	N	%
Alabama	2	0.83%	1	0.65%
Alaska	3	1.25%	2	1.29%
Arizona	4	1.67%	3	1.94%
Arkansas	2	0.83%	1	0.65%
California	33	13.75%	30	19.35%
Colorado	7	2.92%	7	4.52%
Connecticut	4	1.67%	3	1.94%
Delaware	1	0.42%	0	0.00%
Florida	14	5.83%	9	5.81%
Georgia	10	4.17%	9	5.81%
Hawaii	2	0.83%	1	0.65%
Idaho	3	1.25%	1	0.65%
Illinois	4	1.67%	3	1.94%
Indiana	3	1.25%	2	1.29%
Iowa	3	1.25%	2	1.29%
Kansas	4	1.67%	1	0.65%
Kentucky	2	0.83%	1	0.65%
Louisiana	1	0.42%	1	0.65%
Maine	3	1.25%	0	0.00%
Maryland	2	0.83%	1	0.65%

State	Work Activity Survey		Content Domain Survey	
	N	%	N	%
Massachusetts	7	2.92%	2	1.29%
Michigan	6	2.50%	5	3.23%
Minnesota	5	2.08%	2	1.29%
Mississippi	1	0.42%	0	0.00%
Missouri	3	1.25%	1	0.65%
Montana	1	0.42%	0	0.00%
Nebraska	3	1.25%	1	0.65%
Nevada	3	1.25%	1	0.65%
New Hampshire	1	0.42%	0	0.00%
New Jersey	12	5.00%	9	5.81%
New Mexico	1	0.42%	1	0.65%
New York	7	2.92%	5	3.23%
North Carolina	6	2.50%	4	2.58%
North Dakota	2	0.83%	1	0.65%
Ohio	6	2.50%	5	3.23%
Oklahoma	3	1.25%	2	1.29%
Oregon	9	3.75%	8	5.16%
Pennsylvania	11	4.58%	8	5.16%
Rhode Island	3	1.25%	1	0.65%
South Carolina	1	0.42%	0	0.00%
South Dakota	1	0.42%	0	0.00%
Tennessee	3	1.25%	0	0.00%
Texas	17	7.08%	11	7.10%
Utah	2	0.83%	2	1.29%
Vermont	2	0.83%	1	0.65%
Virginia	6	2.50%	4	2.58%
Washington	6	2.50%	1	0.65%
West Virginia	1	0.42%	0	0.00%
Wisconsin	3	1.25%	2	1.29%
Wyoming	1	0.42%	0	0.00%
Total	240	100.00%	155	100.00%

Table 15. Country in which you work

You indicated you work outside the United States of America, select the country in which you work.				
Country	Work Activity		Content Domain	
	N	%	N	%
1. Australia	18	22.50%	14	21%
2. Canada	31	38.75%	24	35%
3. Denmark	2	2.50%	2	3%
4. France	1	1.25%	1	1%
5. Italy	5	6.25%	4	6%
6. Japan	1	1.25%	2	3%
7. Korea	1	1.25%	1	1%
8. Mexico	1	1.25%	1	1%
9. Netherlands	5	6.25%	7	10%
10. New Zealand	1	1.25%	1	1%
11. Norway	4	5.00%	4	6%
12. Spain	1	1.25%	1	1%
13. United Kingdom	8	10.00%	6	9%
14. West Indies	1	1.25%	0	0%
Total	80	100.00%	68	100%

Table 16. Other (please specify): Country in which you work

You indicated you work outside the United States of America, select the country in which you work? Other (please specify)	
Work Activity	Content Domain
Greece	Finland
Hong Kong	Greece
Malta	Hong Kong
Portugal	Puerto Rico, USA
Puerto Rico, USA	

Information about survey respondents' years of work experience, type of practice and work status are presented in Tables 17 through 22. As shown in Table 17, the range of years in which the survey respondents worked as a chiropractic/functional neurologist varied, as the year ranges that had the lowest number of responses was "less than 1 year" and (4.69% on the work activity survey and 8.81% on the content domain survey) and "16 to 20 years" (8.2% on the work activity survey and 6.17% on the content domain survey). The largest numbers for survey responses were for "3 to 5 years" (28.13% on the work activity survey and 25.99% on the content domain survey). As shown in Table 18, the majority of survey respondents (i.e., approximately 91%) have a private practice, approximately 8% practice in a clinic, and approximately 1% work in a college/university. See Tables 19 and 20 for "Other, please specify" responses in response to the question asking to identify their type of practice.

Table 17. Years as a chiropractic/functional neurologist

How many years have you worked as a chiropractic/functional neurologist?				
Response	Work Activity Survey		Content Domain Survey	
	N	%	N	%
Less than 1 year	12	4.69%	20	8.81%
1 to 2 years	32	12.50%	25	11.01%
3 to 5 years	72	28.13%	59	25.99%
6 to 10 years	35	13.67%	41	18.06%
11 to 15 years	43	16.80%	28	12.33%
16 to 20 years	21	8.20%	14	6.17%
More than 20 years	41	16.02%	40	17.62%
Total	256	100.00%	227	100.00%

Table 18. Type of practice

Which of the following best describes your practice?				
Response	Work Activity		Content Domain	
	N	%	N	%
Clinic	18	7.17%	18	8.82%
College/University	4	1.59%	1	0.49%
Private practice	229	91.24%	185	90.69%
Total	251	100.00%	204	100.00%

Table 19. Other (please specify): Type of practice, Work Activity Survey

Work Activity Survey	
Which of the following best describes your practice? Other (please specify) Verbatim Responses	
Response	N
Associate with a private practice consulting/research	1
Hospital	1
No longer in practice	1
not practicing at the moment	1
Total	5

Table 20. Other (please specify): Type of practice, Content Domain Survey

Content Domain	
Which of the following best describes your practice? Other (please specify) Verbatim Responses	
Responses	N
Associate with private practice	1
hospital ED	1
Not currently in practice	1
Work for an integrated practice	1
Total	4

Tables 21 and 22 present the number and percentage of respondents to the work activity survey and content domain survey, respectively, in response to a question asking about their current work status. The majority of survey respondents (79.3% on the work activity survey and 82.21% on the content domain survey) indicated that they are currently practicing full-time as a chiropractic/functional neurologist. The second most popular choice in response to this question was that they are currently practicing part-time as a chiropractic/functional neurologist (i.e., 12.11% on the work activity survey and 11.54% on the content domain survey). Tables 21 and 22 also indicate the number and percentage of multiple responses and responses to “Other, please specify.” The total percentage of those currently practicing full- or part-time as a chiropractic/functional neurologist is slightly higher considering the respondents who selected multiple responses, as a few respondents indicated that they currently practice full- or part-time as a chiropractic/functional neurologist along with another role.

Table 21. Current Work Status: Work Activity Survey (continued on next page)

Work Activity		
Which of the following best describes your current work status? (Select all that apply.)		
Response	N	%
I am a student pursuing a course of study outside of chiropractic/functional neurology.	1	0.39%
I am currently a clinical supervisor at a chiropractic/functional neurology college/school.	2	0.78%
I am currently practicing chiropractic with very, very little functional neurology	1	0.39%
I am currently practicing full-time as a chiropractic/functional neurologist.	203	79.30%
I am currently practicing part-time as a chiropractic/functional neurologist.	31	12.11%
I am currently retired from my practice as a chiropractic/functional neurologist.	1	0.39%
I am currently teaching chiropractic/functional neurology didactic courses at a chiropractic college/school.	1	0.39%
I am not working in the field of chiropractic/functional neurology.	4	1.56%
Multiple responses, including “Other (please specify):” Verbatim Responses		
I am currently practicing full time as a chiropractic/functional neurologist.	1	0.39%
I am currently a clinical supervisor at a chiropractic/functional neurology college/school.		0.00%
I am currently practicing full time as a chiropractic/functional neurologist.		0.39%
I am currently practicing part time as a chiropractic/functional neurologist.	1	0.00%
Faculty at a Post Graduate Neurology Institution		0.00%
I am currently practicing full time as a chiropractic/functional neurologist.	2	0.78%
I am currently teaching chiropractic/functional neurology didactic courses at a chiropractic college/school.		0.00%
I am currently practicing part time as a chiropractic/functional neurologist.	1	0.39%
Looking for sustainable work		0.00%
I am currently practicing part time as a chiropractic/functional neurologist.	1	0.39%
4x- Brain Balance Centers		0.00%
I am currently practicing part time as a chiropractic/functional neurologist.	1	0.39%
I am currently teaching chiropractic/functional neurology didactic courses at a chiropractic college/school.		0.00%
I am currently practicing part time as a chiropractic/functional neurologist.	1	0.39%
Italy has not yet accepted Chiropractic as a valid profession much less so functional neurology.		0.00%
Other (please specify): Verbatim Responses		
I do consulting/research	1	0.39%
Chiropractic Neurology and Medical Neurology since I am an MD too.	1	0.39%
I work at a hospital performing EMG/NCV, EEG and IOM testing.	1	0.39%
part time practice and part time teaching	1	0.39%
Total	256	100.00%

Table 22. Current work status: Content Domain Survey

Content Domain		
Which of the following best describes your current work status? (Select all that apply.)		
Response	N	%
I am currently a clinical supervisor at a chiropractic/functional neurology college/school.	1	0.48%
I am currently practicing full time as a chiropractic/functional neurologist.	171	82.21%
I am currently practicing part time as a chiropractic/functional neurologist.	24	11.54%
I am not working in the field of chiropractic/functional neurology.	3	1.44%
Multiple responses, including “Other (please specify):” Verbatim Responses		
I am currently practicing full time as a chiropractic/functional neurologist.	1	0.48%
Faculty for Post Graduate Education in Neurology		0.00%
I am currently practicing full time as a chiropractic/functional neurologist.		1.44%
I am currently teaching chiropractic/functional neurology didactic courses at a chiropractic college/school.	3	0.00%
I am currently practicing part time as a chiropractic/functional neurologist.		0.48%
I am currently teaching chiropractic/functional neurology didactic courses at a chiropractic college/school.	1	0.00%
I am currently practicing part time as a chiropractic/functional neurologist.	1	0.48%
Looking for sustainable work		0.00%
I am currently retired from my practice as a chiropractic/functional neurologist.	1	0.48%
moving later this year - possible set up practice then		0.00%
Other (please specify): Verbatim Responses		
part time practice and part time teaching	1	0.48%
regular chiro with few special cases of FN work due to license restrictions	1	0.48%
Total	208	100.00%

Tables 23 and 24 present information about survey respondents’ educational background for the work activity survey and content domain survey, respectively. The majority (i.e., more than 90%) of survey respondents’ highest level of education/credentials is a DC. Tables 23 and 24 also indicate the number and percentage of multiple responses and responses to “Other, please specify.” The total percentage of those whose highest level of education is a DC is slightly higher considering the respondents who selected multiple responses, as a few respondents indicated that they have a DC in addition to having other degrees/credentials.

Table 23. Highest level of education: Work Activity Survey

Work Activity		
What is your highest level of education?		
Degree/Credential	N	%
DC	234	91.41%
MD	1	0.39%
Ph.D.	1	0.39%
Other (Please specify): Verbatim Responses		
1. ACNB diplomat	1	0.39%
2. BsC chiro	1	0.39%
3. DACNB	4	1.56%
4. DC and MD	1	0.39%
5. DC and Registered Nurse (Working of Family Nurse Practitioner)	1	0.39%
6. DC, DACAN	1	0.39%
7. DC, DACNB	1	0.39%
8. DC, DACNB, FNOR	1	0.39%
9. DC, PhD	1	0.39%
10. M, Chiro (Macquarie)	1	0.39%
11. Masters Degree	2	0.78%
12. MASTERS DEGREE	1	0.39%
13. MD DC	1	0.39%
14. MSc	1	0.39%
15. ND	2	0.78%
Total	256	100.00%

Table 24. Highest level of education: Content Domain Survey

Content Domain		
What is your highest level of education?		
Response	N	%
DC	187	90.34%
MD	1	0.48%
Other (Please specify): Verbatim Responses		0.00%
1. D.A.C.N.B.	1	0.48%
2. DACNB	3	1.45%
3. DACNB	1	0.48%
4. DACNB AAEM PhD began	1	0.48%
5. DACNB, FACFN	1	0.48%
6. DC & MD	1	0.48%
7. DC, DACAN	1	0.48%
8. DC, MD, PhD(c)	1	0.48%
9. DC, PhD	1	0.48%
10. DO	1	0.48%
11. Master	1	0.48%
12. Masters Degree	1	0.48%
13. MS	1	0.48%
14. Msc Chiro paed40	1	0.48%
15. ND	2	0.97%
16. postdoctoral fellowships in neurology	1	0.48%
Total	207	100.00%

Tables 25 through 28 present information about the percentage of work associated with the different types of disorders, pathology, and injuries associated with chiropractic/functional neurology. Tables 25 and 26 indicate the mean percentage of work in a selection of categories (i.e., pathologies, injuries and disorders) related to chiropractic/functional neurology for the work activity survey and content domain survey, respectively. In addition to the mean percentage, the data displayed include: the standard deviation (SD), the lowest percentage (MIN) and the highest percentage (MAX), and the total number of respondents. The highest mean percentage of work is in the

pain/neuropathies category (i.e., mean percentage is 37.07% for the work activity survey and 38.39% for the content domain survey). Of the remaining list of categories, cognitive disorders (Dementia, Alzheimer's) had the lowest mean percentage on both surveys (i.e., 5.16% and 5.84%, respectively). Tables 27 and 28 present the verbatim responses to "Other, please specify" for this question for the work activity survey and content domain survey, respectively.

Table 25. Work Activity Survey: Type of work associated with chiropractic/functional neurology

Work Activity Survey: Percentage of work in chiropractic/functional neurology in the following categories					
Category	Mean	SD	MIN	MAX	N
Pain/neuropathies	37.07	28.90	0	100	259
Movement disorders	7.67	8.04	0	70	259
Brain/head injuries	19.32	18.85	0	95	259
Equilibrium disorders	15.13	11.47	0	60	259
Developmental Disorders (Autism, Cerebral Palsy, etc.)	8.87	12.24	0	80	259
Cognitive Disorders (Dementia, Alzheimer's, etc.)	5.16	6.68	0	60	259
Other	6.77	17.37	0	100	259

Table 26. Content Domain Survey: Type of work associated with chiropractic/functional neurology

Content Domain Survey: Percentage of work in chiropractic/functional neurology in the following categories					
Category	Mean	SD	MIN	MAX	N
Pain/neuropathies	38.39	28.05	0	100	207
Movement disorders	8.77	7.56	0	50	207
Brain/head injuries	18.43	16.76	0	80	207
Equilibrium disorders	15.96	10.83	0	50	207
Developmental Disorders (Autism, Cerebral Palsy, etc.)	8.28	11.61	0	100	207
Cognitive Disorders (Dementia, Alzheimer's, etc.)	5.84	7.60	0	60	207
Other	4.33	10.86	0	70	207

Analysis of the Job Analysis Validation Data

Work Activities and Task Statements

For the work activity survey, the survey respondents were asked to rate the relative importance of the tasks that are associated with the major work activities and the frequency in which the tasks are performed. The average rating (M), standard deviation (SD), the lowest or minimum rating (MIN), the highest or maximum rating (MAX) of the importance and frequency ratings and number of responses are shown in Table 29 below. For each task, the number (frequency) and percentage of respondents selecting each point of the importance rating scale and frequency scales are shown in Appendix K.

For the importance ratings of the task statements, the average ratings ranged from 1.61 for Task 2.13.13 to 2.93 for Task 1.1. The SD is a statistic that indicates the range or dispersion of raw scores around the mean. For this data set, the SD ranged from 0.30 to 1.00. The minimum (MIN) and maximum (MAX) ratings were 0 to 3. All tasks' mean ratings ranged from more than somewhat important to very important (i.e., an average rating of 1.61 or higher).

For the frequency ratings of the task statements, the mean ratings ranged from 0.79 for Task 2.10.2 to 3.84 for Task 5.1. For this data set, the SD ranged from 0.57 to 1.81. The minimum (MIN) and maximum (MAX) ratings were 0 to 4. No task received a mean frequency rating of "never" performed. The majority of tasks were rated as frequently performed. These mean importance and frequency ratings are more than sufficient to justify retention of the majority of task statements in the draft test specifications.

After completing the importance and frequency ratings, survey respondents were presented with a question asking to apply a rating scale to indicate how well the tasks in the survey represent the specialty practice of chiropractic/functional neurology (see Table 30). The majority of those responding to the question (89%) indicated that the survey represents the specialty practice “very well” or “well.” The survey respondents were then asked if they have any comments about the comprehensiveness and/or accuracy of the task statements, or if they believe there was a missing task statement. See Appendix L for survey respondents’ comments about the task statements.

Table 29. Representativeness of the tasks: Work Activity Survey

Work Activity Survey		
How well do the tasks in this survey represent the specialty practice of chiropractic/functional neurology?		
Response	N	%
Very well	125	68.68%
Well	37	20.33%
Adequately	17	9.34%
Poorly	2	1.10%
Very poorly	1	0.55%
Total	182	100.00%

As shown in Table 31, for each work activity, the survey respondents were asked to indicate the relative importance of each work activity in the specialty practice of chiropractic/functional neurology. They were also asked to indicate the percentage of time spent performing tasks in each work activity. For the work activity survey, the average importance ratings for the work activities ranged from 2.40 for 3. Conduct or Order Special Studies and 6. Referral to 2.94 for 1. Take a Patient History and 2. Perform a Physical Exam. The SD ranged from 0.24 to 0.72. The importance rating data from the content domain survey has a similar pattern of data compared to the importance rating data from work activity survey, as work activities that have higher mean ratings are high on both surveys and work activities that have lower mean ratings are low on both surveys. As shown in Tables 32 and 33, the number and percentage of respondents selecting each point of the importance rating scale indicate that more than half or the majority (i.e., from 51.08% to 94.09%) selected “Very Important” for the work activities. The data presented in Tables 32 and 33 show similar patterns, as the number and percentage of respondents for each point of the importance rating scale are comparable on the two surveys.

As shown in Table 34, survey respondents were asked to indicate the percentage of time spent performing tasks in each of the work activities. For the work activity survey, the average (Mean) percentage of time ranged from 3.97% for 6. Referral to 36.18% for 5. Treatment and Rehabilitation. The percentage of time data from the content domain survey show a similar pattern compared to the percentage of time data from the work activity survey.

These mean importance ratings and average percentages of time spent are more than sufficient to justify retention of all of the work activities in the draft test specifications.

After completing the importance ratings and indicating the percentage of time spent performing tasks in each work activity, survey respondents were presented with a question asking if they have any comments about the comprehensiveness and/or accuracy of the work activities, or if they believe there was a missing work activity. See Appendix M for survey respondents’ comments in response to this question.

Table 27. Work Activity Mean Importance Ratings

Work Activity Mean Importance Ratings								
Work Activity	Work Activity Survey, N = 186				Content Domain Survey, N = 152			
	M	SD	MIN	MAX	M	SD	Min	Max
1. Take a Patient History	2.94	0.24	2	3	2.93	0.27	1	3
2. Perform a Physical Exam	2.94	0.24	2	3	2.95	0.22	2	3
3. Conduct or Order Special Studies	2.40	0.72	0	3	2.09	0.83	0	3
4. Identify Diagnosis(es), Differential Diagnosis(es), Disease Processes, Metabolic Rate, Pathways	2.79	0.41	2	3	2.75	0.50	1	3
5. Treatment and Rehabilitation	2.91	0.30	1	3	2.93	0.26	2	3

Work Activity Mean Importance Ratings								
Work Activity	Work Activity Survey, N = 186				Content Domain Survey, N = 152			
	M	SD	MIN	MAX	M	SD	Min	Max
6. Referral	2.40	0.69	0	3	2.14	0.81	0	3

Table 28. Work Activity Importance Rating Scale Data: Work Activity Survey

Work Activity Survey										
Work Activity	Very Important		Important		Somewhat Important		Not Important		Total	
	N	%	N	%	N	%	N	%	N	%
1. Take a Patient History	175	94.09%	11	5.91%	0	0.00%	0	0.00%	186	100%
2. Perform a Physical Exam	175	94.09%	11	5.91%	0	0.00%	0	0.00%	186	100%
3. Conduct or Order Special Studies	97	52.15%	68	36.56%	19	10.22%	2	1.08%	186	100%
4. Identify Diagnosis(es), Differential Diagnosis(es), Disease Processes, Metabolic Rate, Pathways	146	78.49%	40	21.51%	0	0.00%	0	0.00%	186	100%
5. Treatment and Rehabilitation	171	91.94%	14	7.53%	1	0.54%	0	0.00%	186	100%
6. Referral	95	51.08%	71	38.17%	19	10.22%	1	0.54%	186	100%

Table 29. Work Activity Importance Rating Scale Data: Content Domain Survey

Content Domain Survey										
Work Activity	Very Important		Important		Somewhat Important		Not Important		Total	
	N	%	N	%	N	%	N	%	N	%
1. Take a Patient History	143	94.08%	8	5.26%	1	0.66%	0	0.00%	152	100%
2. Perform a Physical Exam	144	94.74%	8	5.26%	0	0.00%	0	0.00%	152	100%
3. Conduct or Order Special Studies	57	37.50%	53	34.87%	40	26.32%	2	1.32%	152	100%
4. Identify Diagnosis(es), Differential Diagnosis(es), Disease Processes, Metabolic Rate, Pathways	119	78.29%	28	18.42%	5	3.29%	0	0.00%	152	100%
5. Treatment and Rehabilitation	141	92.76%	11	7.24%	0	0.00%	0	0.00%	152	100%
6. Referral	58	38.16%	60	39.47%	31	20.39%	3	1.97%	152	100%

Table 30. Work Activity Percentage of Time

Work Activity Percentage of Time														
Work Activity	Work Activity Survey							Content Domain Survey						
	M	Mode	Median	SD	MIN	MAX	N	M	Mode	Median	SD	MIN	MAX	N
1.	20.87	20	20	11.73	1	100	186	19.91	20.00	20.00	9.83	2	50	152
2.	22.17	20	20	9.89	0	55	186	20.95	20.00	20.00	7.64	3	50	152
3.	6.78	5	5	5.58	0	50	181	6.95	5.00	5.00	5.13	0	20	152
4.	10.45	10	10	6.67	0	40	184	12.96	10.00	10.00	6.93	0	40	152
5.	36.18	25	30	19.55	0	95	186	34.58	20.00	30.00	17.72	7	90	152
6.	3.97	5	5	2.86	0	16	180	4.65	5.00	5.00	3.11	0	16	152
Total	100.42							100						

After responding to the questions associated with the data summarized above, survey respondents were asked to indicate the percentage of test questions on the written examination that should be associated with each work activity. These data are presented in Tables 35 and 36.

Table 31. Work Activities: Representation on Written Exam (Work Activity Survey)

Work Activities Survey							
Representation on Written Examination							
Work Activities	M	Mode	Median	SD	Min	Max	N
1. Take a Patient History	18.38	20	20	10.05	2	100	182

Work Activities Survey							
Representation on Written Examination							
Work Activities	M	Mode	Median	SD	Min	Max	N
2. Perform a Physical Exam	22.36	20	20	8.31	0	50	182
3. Conduct or Order Special Studies	8.25	5	10	4.54	0	20	182
4. Identify Diagnosis/Differential Diagnosis/Disease Processes/Metabolic Rate/Pathways	19.46	20	20	10.16	0	52	182
5. Treatment and Rehabilitation	25.67	20	25	11.30	0	60	182
6. Referral	5.88	5	5	3.70	0	20	182
	100.00						

Table 32. Work Activities: Representation on Written Exam (Content Domain Survey)

Work Activities – Content Domain Survey							
Representation on Written Examination							
Work Activities	M	Mode	Median	SD	Min	Max	N
1. Take a Patient History	18.21	20	20	8.19	0	50	151
2. Perform a Physical Exam	21.03	20	20	8.45	0	50	151
3. Conduct or Order Special Studies	8.36	10	10	4.68	0	30	151
4. Identify Diagnosis/Differential Diagnosis/Disease Processes/Metabolic Rate/Pathways	20.09	20	20	9.10	1	60	151
5. Treatment and Rehabilitation	26.21	20	23	12.84	5	75	151
6. Referral	6.09	5	5	3.39	0	20	151
	100.00						

Content Domains and KSAs

For the content domain survey, the survey respondents were asked to rate the importance of the KSAs and the frequency in which the KSAs are used in practice. The average rating (M), standard deviation (SD), the lowest or minimum rating (MIN), the highest or maximum rating (MAX) of the importance and frequency ratings and number of responses are shown in Table 37 below. For each KSA, the number (frequency) and percentage of respondents selecting each point of the importance rating scale and frequency scales are shown in Appendix N.

For the importance ratings for the KSAs, the average ratings ranged from 1.78 for KSA 7.27. to 2.86 for KSA 8.4. The SD is a statistic that indicates the range or dispersion of raw scores around the mean. For this data set, the SD ranged from 0.40 to 0.98. The minimum (MIN) and maximum (MAX) ratings were 0 to 3. All KSAs' mean ratings ranged from more than somewhat important to very important (i.e., an average rating of 1.78 or higher).

For the frequency ratings, the mean ratings ranged from 1.38 for KSA 16.32 to 3.91 for KSA 16.29. For this data set, the SD ranged from 0.38 to 1.67. The minimum (MIN) and maximum (MAX) ratings were 0 to 4. The majority of KSAs were rated as frequently performed. These mean importance and frequency ratings are more than sufficient to justify retention of the majority of the KSAs in the draft test specifications. The importance and frequency rating scale data are presented in Appendix K.

As shown in Table 38, for each content domain, the survey respondents were asked to indicate the relative importance of each content domain in their specialty practice of chiropractic/functional neurology. For the content domain survey, the average (mean) importance ratings ranged from 2.48 for 15. Neuroendocrine System to 2.88 for 8. Cerebellar/Vestibular. The SD ranged from 0.34 to 0.71. The difference between the importance rating data from the work activity survey compared to the content domain survey is small, as the differences between ratings ranged from 0.01 to 0.14. They were also asked to indicate the frequency in which the content domains are used in their specialty practice of chiropractic/functional neurology. For the content domain survey, the average (mean) frequency ratings ranged from 3.07 for 15. Neuroendocrine System to 3.87 for 16. Pain. The SD ranged from 0.44 to 1.21. The difference between the frequency ratings from the work activity and content domain surveys is very small. The data presented in Tables 39 and 40 show similar patterns, as the number and percentage of respondents for each point of the importance and frequency rating scales are comparable. For example, as shown in Tables 39 and 40, the number and percentage of respondents selecting each point of the importance rating scale indicate that more than half or the majority (i.e., from 54% to 89%) selected "Very Important" for the content domains. These

mean importance and frequency ratings are more than sufficient to justify retention of all of the content domains in the draft test specifications.

Table 33. Content Domains: Mean Frequency and Importance Ratings (continued on next page)

	Content Domain Survey								Work Activity Survey							
	Frequency, N = 153				Importance, N = 153				Frequency, N = 181				Importance, N = 181			
	M	SD	MIN	MAX	M	SD	MIN	MAX	M	SD	MIN	MAX	M	SD	MIN	MAX
1. Neuro n theory	3.50	0.97	0	4	2.65	0.64	0	3	3.44	1.07	0	4	2.52	0.72	0	3
2. Recept or Systems	3.67	0.77	0	4	2.69	0.55	1	3	3.61	0.85	0	4	2.59	0.62	0	3
3. Periph eral Nerves	3.80	0.56	1	4	2.81	0.41	1	3	3.71	0.70	0	4	2.67	0.59	0	3
4. Spinal Cord	3.58	0.87	0	4	2.73	0.50	1	3	3.59	0.82	0	4	2.64	0.60	0	3
5. Brainste m	3.72	0.76	0	4	2.79	0.45	1	3	3.77	0.65	0	4	2.77	0.53	0	3
6. Crania l Nerves	3.76	0.63	1	4	2.78	0.46	1	3	3.73	0.70	0	4	2.74	0.53	0	3
7. Head and Face Pain	3.62	0.75	1	4	2.72	0.51	1	3	3.61	0.72	0	4	2.66	0.57	0	3
8. Cerebe llar/Vest ibular	3.82	0.53	1	4	2.88	0.34	1	3	3.87	0.53	0	4	2.87	0.39	0	3
9. Basal Ganglia	3.38	0.92	0	4	2.69	0.53	1	3	3.52	0.89	0	4	2.64	0.59	0	3
10. Refle xogenic Systems	3.57	0.82	0	4	2.69	0.56	1	3	3.57	0.85	0	4	2.59	0.65	0	3
11. Auton omic Nervous System	3.72	0.75	0	4	2.81	0.43	1	3	3.71	0.75	0	4	2.74	0.54	0	3
12. Limb ic System	3.24	1.00	1	4	2.50	0.69	1	3	3.23	1.03	0	4	2.39	0.76	0	3
13. Lobe s of the Brain	3.56	0.89	1	4	2.69	0.59	0	3	3.56	0.84	0	4	2.62	0.59	0	3
14. Brain and its Environ ment	3.29	1.06	0	4	2.54	0.62	1	3	3.43	0.91	0	4	2.49	0.66	0	3
15. Neur oendocri ne System	3.07	1.21	0	4	2.48	0.71	0	3	3.17	1.18	0	4	2.44	0.73	0	3
16. Pain	3.87	0.44	1	4	2.82	0.44	1	3	3.79	0.63	0	4	2.75	0.52	0	3

Table 34. Content Domains: Frequency and Importance Ratings, Content Domain Survey

Content Domains Frequency and Importance Ratings; Content Domain Survey																			
Content Domains	Frequency, N = 153										Importance, N = 153								
	4		3		2		1		0		3		2		1		0		
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
1. Neuron theory	113	74%	16	10%	13	8%	9	6%	2	1%	112	73%	29	19%	11	7%	1	1%	
2. Receptor Systems	122	80%	17	11%	10	7%	2	1%	2	1%	113	74%	33	22%	7	5%	0	0%	
3. Peripheral Nerves	133	87%	12	8%	6	4%	2	1%	0	0%	125	82%	27	18%	1	1%	0	0%	
4. Spinal Cord	117	76%	16	10%	12	8%	7	5%	1	1%	115	75%	34	22%	4	3%	0	0%	
5. Brainstem	130	85%	10	7%	7	5%	5	3%	1	1%	124	81%	26	17%	3	2%	0	0%	
6. Cranial Nerves	129	84%	16	10%	4	3%	4	3%	0	0%	122	80%	28	18%	3	2%	0	0%	

Content Domains Frequency and Importance Ratings; Content Domain Survey																		
Content Domains	Frequency, N = 153										Importance, N = 153							
	4		3		2		1		0		3		2		1		0	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
7. Head and Face Pain	114	75%	26	17%	7	5%	6	4%	0	0%	114	75%	35	23%	4	3%	0	0%
8. Cerebellar/Vestibular	134	88%	13	8%	4	3%	2	1%	0	0%	136	89%	16	10%	1	1%	0	0%
9. Basal Ganglia	94	61%	32	21%	19	12%	7	5%	1	1%	110	72%	38	25%	5	3%	0	0%
10. Reflexogenic Systems	111	73%	25	16%	11	7%	5	3%	1	1%	112	73%	34	22%	7	5%	0	0%
11. Autonomic Nervous System	128	84%	15	10%	3	2%	6	4%	1	1%	126	82%	25	16%	2	1%	0	0%
12. Limbic System	80	55%	35	24%	17	12%	14	10%	0	0%	93	61%	43	28%	17	11%	0	0%
13. Lobes of the Brain	118	77%	13	8%	12	8%	10	7%	0	0%	115	75%	30	20%	7	5%	1	1%
14. Brain and its Environment	96	63%	24	16%	16	10%	16	10%	1	1%	93	61%	50	33%	10	7%	0	0%
15. Neuroendocrine System	82	54%	29	19%	20	13%	15	10%	7	5%	91	59%	45	29%	16	10%	1	1%
16. Pain	138	90%	11	7%	3	2%	1	1%	0	0%	128	84%	22	14%	3	2%	0	0%

Table 35. Content Domains: Frequency and Importance Ratings, Work Activity Survey

Content Domains Frequency and Importance Ratings; Work Activity Survey																		
Content Domains	Frequency, N = 181										Importance, N = 181							
	4		3		2		1		0		3		2		1		0	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
1. Neuron theory	135	75%	14	8%	12	7%	17	9%	3	2%	117	65%	44	24%	18	10%	2	1%
2. Receptor Systems	141	78%	20	11%	11	6%	7	4%	2	1%	118	65%	52	29%	10	6%	1	1%
3. Peripheral Nerves	148	82%	19	10%	10	6%	3	2%	1	1%	131	72%	43	24%	5	3%	2	1%
4. Spinal Cord	134	74%	29	16%	9	5%	8	4%	1	1%	127	70%	44	24%	9	5%	1	1%
5. Brainstem	154	85%	18	10%	4	2%	4	2%	1	1%	147	81%	27	15%	6	3%	1	1%
6. Cranial Nerves	151	83%	17	9%	8	4%	4	2%	1	1%	140	77%	37	20%	2	1%	2	1%
7. Head and Face Pain	129	71%	40	22%	7	4%	4	2%	1	1%	127	70%	47	26%	6	3%	1	1%
8. Cerebellar/Vestibular	167	92%	8	4%	3	2%	2	1%	1	1%	159	88%	21	12%	0	0%	1	1%
9. Basal Ganglia	127	70%	33	18%	12	7%	6	3%	3	2%	124	69%	49	27%	7	4%	1	1%
10. Reflexogenic Systems	133	73%	30	17%	10	6%	5	3%	3	2%	121	67%	48	27%	10	6%	2	1%
11. Autonomic Nervous System	149	82%	20	11%	5	3%	5	3%	2	1%	141	78%	35	19%	3	2%	2	1%
12. Limbic System	95	52%	54	30%	14	8%	14	8%	4	2%	98	54%	59	33%	21	12%	3	2%
13. Lobes of the Brain	131	72%	30	17%	11	6%	8	4%	1	1%	122	67%	51	28%	7	4%	1	1%
14. Brain and its Environment	118	65%	35	19%	17	9%	10	6%	1	1%	105	58%	61	34%	14	8%	1	1%
15. Neuroendocrine System	102	56%	39	22%	20	11%	9	5%	11	6%	101	56%	63	35%	13	7%	4	2%
16. Pain	158	87%	13	7%	6	3%	3	2%	1	1%	141	78%	35	19%	4	2%	1	1%

After completing the importance and frequency ratings, survey respondents were presented with a question asking to apply a rating scale to indicate how well the content domains in the survey represent the specialty practice of chiropractic/functional neurology (see Table 41). The majority of those responding to the question (76%) indicated that the survey represents the specialty practice “very well” or “well.” The survey respondents were then asked if they have any comments about the comprehensiveness and/or accuracy of the task statements, or if they believe there was a missing task statement. See Tables 42 and 43 for comments about the content domains and KSAs, respectively.

Table 36. Representativeness of the content domains: Content Domain Survey

Content Domain Survey		
How well do the content domains in this survey represent the specialty practice of chiropractic/functional neurology?		
Response	N	%
Very well	76	49%
Well	42	27%
Adequately	33	21%
Poorly	3	2%
Very poorly	0	0%
Total	154	100%

Table 37. Additional content domains: Content Domain Survey

Content Domain Survey - Verbatim Responses
Please list any additional content domains you believe should have been included in the survey.

Content Domain Survey - Verbatim Responses	
Please list any additional content domains you believe should have been included in the survey.	
1	Can't think of any.
2	Aero-Toxic Syndrome / MdDS
3	Concussion prevention/testing
4	Did well again. Troubles understanding if I should answer the first column in regards to the frequency of identifying such conditions/etc or if it the act of looking for it (ex. I am aware of signs/symptoms of sepsis and will have this knowledge in the back of my mind daily but have not seen a case in my particular practice as of yet of 10 years) - If I answer "0", then I don't look for it, if I answer "1" then I'm seeing it 1-2x/year, "4", look for it daily/weekly...? I chose "1" as I didn't want it to list that I didn't look or was aware of it. Hope I am consistent with others, sorry if I misinterpreted.
5	extended vestibular investigation
6	Eye movement abnormalities: fixation. Vergence, pursuits, saccades.
7	gait analysis, pediatric spectrum disorders.
8	How frequently are you required to examine someone for:
9	How much self-study in the field of neurology, do you work in a solo or multi-doctor clinic, are they specialized in chiropractic neurology as well?
10	I thought you guys were pretty thorough.
11	If I have never seen a patient with Cavernous sinus syndrome, then it seems stupid to write that "I do not perform this test".
12	it was very thorough
13	looks like you had it covered
14	More emphasis on TBI. Less emphasis on metabolic. One question asks how important are they in practice, well they're ALL important to our patients, but so are broken legs and tooth abscesses. We should know what they look like and be able to refer them out.
15	Neurofeedback
16	none additional
17	POTS
18	Response and reaction time.
19	There are many skills that I need to know daily just in case but it does not mean they all present. I answered the question about how my DDX works on a daily basis.
20	vestibular rehabilitation
21	While I believe that every domain you have listed is important, the simple fact is that the majority of the severe conditions you mention do not come into my office.

Table 38. Additional knowledge, skills and abilities: Content Domain Survey

Content Domain Survey – Verbatim Responses	
Please list any additional knowledge, skills and/or abilities you believe should have been included in the survey and indicate its associated content domain.	
1	Aero-Toxic Syndrome / MdDS
2	Do you give health talks, lectures in the field of chiropractic neurology?
3	I cannot think of any at this time.
4	I do not understand but would like to know more of auto-immune disease forming in long standing inflammatory processes. Laundau kleffner and PANDAS
5	i have nothing to add. Great work!
6	More practical application has always been discussed and desired among my peers regarding the exam. ie: treatment protocols, exam proficiency, addressing non pathological everyday hemisphericity, more in depth cerebellar dx and treatment, more minor vestibular imbalances.
7	none additional
8	nystagmus, skew deviations, diplopia, afferent pupillary defects,
9	One of the most impactful areas of my practice is the skill to complete a history and narrow the diagnostic differentials. In many cases I am the third or fourth doctor the patient has seen with no help and having them understand that their condition can be sorted out really makes a difference for them.
10	Performed well.
11	Perhaps mention diagnostic and therapeutic equipment such as NSI, VOG, Saccadometry, RightEye system, etc.
12	QEEG
13	This is tedious. Do not pester me to do this in the future.
14	very inclusive
15	VNG CAPS or rotational device QEEG; Hyperbaric experience

After responding to the questions associated with the data summarized above, survey respondents were asked to indicate the percentage of test questions on the written examination that should represent each content domain. See Table 44 for these data.

Table 39. Content Domains: Representation on the Written Examination

Content Domains Survey – Representation on the Written Examination						
	Content Domains	Mean	SD	Mode	Median	Min MAX
1.	Neuron Theory	4.99	2.46	5	5	0 10
2.	Receptor Systems	5.21	2.57	5	5	0 20
3.	Peripheral Nerves	7.24	3.19	5	6	0 20
4.	Spinal Cord	6.44	2.55	5	5	0 20
5.	Brainstem	8.12	3.42	10	8	0 25
6.	Cranial Nerves	7.33	2.69	10	7	0 15
7.	Head and Face Pain	5.65	2.22	5	5	0 15
8.	Cerebellar/Vestibular	9.65	3.41	10	10	1 20
9.	Basal Ganglia	6.08	2.47	5	5	0 15
10.	Reflexogenic System	5.11	2.14	5	5	0 13
11.	Autonomic Nervous System	7.21	2.84	5	6	0 15
12.	Limbic System	4.31	1.93	5	5	0 10
13.	Lobes of the Brain	5.97	2.97	5	5	0 25
14.	Brain and Its Environment	4.75	2.34	5	5	0 20
15.	Neuroendocrine System	4.19	1.90	5	5	0 10
16.	Pain	7.76	7.33	5	6	0 59
		100.00				

To obtain data for use in developing preliminary test weights for the practical examination, survey respondents were asked to indicate the percentage of the performance examination that should be devoted to each component of the physical examination. Table 45 presents data from the work activity and content domains surveys. The survey respondents were also asked to indicate the percentage of practical examination that should be devoted to the case study and physical examination, which comprise the practical examination. See Table 46 for these data.

Table 40. Percentage allocated to components of the physical examination

Physical Examination Components	Work Activity Survey N=183				Content Domain Survey N=151			
	M	SD	Min	Max	M	SD	Min	Max
1. Obtain the Patient's Vital Signs	6.84	7.68	0	100	6.89	3.25	0	20
2. Perform Cranial Nerve Examinations	12.20	4.94	0	35	11.91	5.17	5	50
3. Perform Sensory Examinations	10.07	3.37	0	20	10.30	3.16	3	23
4. Perform Testing of the Motor Systems (Muscle Strength belongs in this section)	11.40	4.25	0	30	10.75	3.24	4	25
5. Perform Reflex Testing (Under Motor)	8.41	3.20	0	20	8.43	2.80	2	15
6. Evaluate the Cerebellum and Vestibular Systems	14.59	4.89	0	30	15.38	5.20	5	30
7. Perform and/or Order Special Tests Related to the Cerebellum, Balance and Vestibular Systems	11.68	5.34	0	30	11.75	4.72	0	30
8. Perform Tests Related to the Basal Ganglia	9.84	3.36	0	20	9.62	3.05	0	20
9. Perform Tests Related to the Limbic System	7.48	3.30	0	20	7.07	3.22	0	20
10. Perform Cognitive Tests	7.49	3.28	0	20	7.90	4.34	0	40
	100.00				100.00			

Table 41. Percentage allocated to components of the practical examination

Practical Examination	Work Activity Survey, N = 183						Content Domain Survey, N = 151					
	M	MODE	MEDIAN	SD	MIN	MAX	M	MODE	MEDIAN	SD	MIN	MAX
Case Study	47.60	50	50	16.47	10	90	47.75	50	50	15.41	10	90
Physical Examination	52.40	50	50	16.47	10	90	52.25	50	50	15.41	10	90
	100						100					

Test Specifications

Written Examination

Preliminary test weights were derived for the work activities and the content domains, as the current written examination is assembled according to both components. (Each test question is coded to a work activity and content domain.) To derive preliminary test weights for the written examination, a multiplicative model was used to combine the validity data collected from the study. Three different sets of preliminary test weights were produced for review and consideration by the committee for finalizing the test specifications for the written examination. For the work activities and content domains as shown in Tables 47 and 48, respectively, the first set of preliminary test specifications (i.e., #1) was based on the importance and percentage of time estimates for the work activities and content domains, respectively, the second set (#2) was based on the importance and respondents' content representation percentage weights for the work activities and content domains, respectively, and the third set (#3) was based on an average of sets #1 and #2, for the work activities and content domains, respectively.

For set #1, to derive the preliminary test weights, the importance and percentage of time estimates were combined to produce weights for the work activities (Table 47) and for the content domains (Table 48). The sums of each of these data were totaled, and dividing the sum of the work activity/content domain by the total, derived the percentage weight for each work activity/content domain. To derive the preliminary number of test questions by work activity/content domain, the total number of test questions was multiplied by the work activity/content domain weight. The same procedure was followed to derive set #2 preliminary test specifications using the importance and respondents' content representation percentage weights for the work activities and content domains. For set #3, averaging the weights of sets #1 and #2 were used to derive the weights. Tables 47 and 48 also include the current test weights for the work activities and content domains, and the final test weights, which is described below. The current test weights were included on the table so the committee may use the information for comparative purposes. See the next section of the report for a description of the committee's review and finalization of the test specifications for the examination.

Table 42. Work Activities: Preliminary and Final Test Specifications for the Written Examination

Work Activities: Preliminary and Final Test Specifications for the Written Examination										
Work Activities	Test Specifications, Percentage (%) and Number (N) of Test Questions									
	Current		Preliminary Test Specifications						Final	
			#1		#2		#3			
	%	N	%	N	%	N	%	N	%	N
1. Take a Patient History	3.73%	11	21.38%	64.13	19.10%	57.31	20.24%	60.72	5%	15
2. Perform a Physical Exam	7.66%	23	22.71%	68.13	23.23%	69.70	22.97%	68.91	10%	30
3. Conduct or Order Special Studies	9.22%	28	5.73%	17.18	7.07%	21.20	6.40%	19.19	6%	18
4. Identify Diagnosis(es), Differential Diagnosis(es), Disease Processes, Metabolic Rate, Pathways	42.60%	128	10.13%	30.40	19.15%	57.45	14.64%	43.92	45%	135
5. Treatment and Rehabilitation	34.99%	105	36.72%	110.17	26.44%	79.31	31.58%	94.74	30%	90
6. Referral	1.80%	5	3.33%	9.99	5.01%	15.03	4.17%	12.51	4%	12
Total Items	100%	300	100%	300	100%	300	100%	300	100%	300

Table 43. Content Domains: Preliminary and Final Test Specifications for the Written Examination

Content Domains: Preliminary and Final Test Specifications for the Written Examination										
Content Domains	Test Specifications, Percentage (%) and Number (N) of Test Questions									
	Current		Preliminary						Final	
			#1		#2		#3			
	%	N	%	N	%	N	%	N	%	N
Autonomic Nervous System	6.64%	20	6.75%	20.25	7.43%	22.28	7.09%	21.26	7%	21
Basal Ganglia	6.56%	20	5.86%	17.58	5.99%	17.98	5.93%	17.78	6%	18
Brain and Its Environment	5.73%	17	5.41%	16.23	4.42%	13.27	4.91%	14.74	5%	15
Brainstem	5.76%	17	6.70%	20.10	8.31%	24.92	7.50%	22.51	8%	23
Cerebellum	6.43%	19	7.11%	21.33	10.19%	30.58	8.65%	25.96	8%	25
Cranial Nerves	5.87%	16	6.75%	20.25	7.47%	22.40	7.11%	21.32	7%	21
Ethics (Special Topics)	1.99%	6								
Head and Face Pain	6.61%	20	6.35%	19.05	5.63%	16.89	5.99%	17.97	6%	18
Limbic System	5.25%	16	5.22%	15.66	3.95%	11.84	4.58%	13.75	5%	14
Lobes of the Brain	6.42%	19	6.19%	18.57	5.90%	17.69	6.04%	18.13	6%	18
Neuro-Endocrine System	4.12%	12	4.91%	14.73	3.80%	11.41	4.36%	13.07	4%	13
Neuron Theory	5.50%	17	5.97%	17.91	4.84%	14.52	5.41%	16.22	5%	16
Pain	6.51%	20	7.03%	21.09	8.01%	24.04	7.52%	22.57	8%	23
Peripheral Nerves	5.30%	16	6.90%	20.70	7.45%	22.36	7.18%	21.53	7%	22
Receptor Systems	4.84%	15	6.37%	19.11	5.14%	15.43	5.76%	17.27	6%	17
Red Flag Issues	4.51%	14								
Reflexogenic Systems	6.56%	20	6.19%	18.57	5.03%	15.10	5.61%	16.83	6%	17
Spinal Cord	5.40%	16	6.29%	18.87	6.43%	19.30	6.36%	19.08	6%	19
Total Items	100.00%	300	100.00%	300	100.00%	300	100.00%	300.00	100%	300

Practical Examination

The current practical examination consists of two parts: a physical examination and a case study. Each part is currently weighted 50% of the practical examination, and within each part, sections of the physical examinations and case study are weighted. Therefore, for the practical examination, the test weights are used for weighting the components of the examination for scoring, rather than designating a certain number of activities per component of the practical examination (i.e., akin to designating a certain number of items according to a test blueprint for a written examination). The weights are reflective of the relative importance/emphasis of the components of the examination. For example, there may be certain physical examination procedures that are limited in the number of steps but may be more important, and therefore, should have greater emphasis/weight on the examination than a physical examination procedure that has a greater number of steps which may be of lesser importance.

The components of the current physical examination are tasks from Work Activity #2. Perform a physical examination. The components of the current case study are aligned to the Work Activities. The preliminary and final test weights for the practical examination are presented in Table 49. The preliminary test weights for the physical examination are based on survey respondents' percentage allocations (see Table 45), and included are the following descriptive statistics: standard deviation (SD), minimum percentage allocation (Min), and maximum

percentage allocation (Max). The preliminary test weights for the case study are based on the test weights for the work activities (see Table 47). The table also presents the current test weights for the physical examination and case study, and includes notes concerning the committee's adjustments to the test specifications. The current test weights were included on the table so the committee may use the information for comparative purposes. See the next section of the report for a description of the committee's review and finalization of the test specifications and weights for the examination.

Table 44. Preliminary Test Specifications for the Practical Examination (continued on next page)

Test Specifications for the Practical Examination							
Current Test Specification		Preliminary Test Specifications Work Activity: Perform a Physical Examination.					Final Test Weights
Test Specifications	Test Weights	Test Specifications	Test Weights	SD	Min	Max	
Physical Examination (PE)							
1. Obtain the Patient's Vital Signs	3	1. Obtain the Patient's Vital Signs	6.84	7.68	0	100	3
2. Perform Cranial Nerve Examinations	20	2. Perform Cranial Nerve Examinations	12.20	4.94	0	35	18
3. Perform Sensory Examinations, including Additional Tests (i.e., motor and sensory special tests to evaluate regions of the brain causing the neurological disorder)	11	3. Perform Sensory Examinations, including Additional Tests (i.e., motor and sensory special tests to evaluate regions of the brain causing the neurological disorder)	10.07	3.37	0	20	12*
4. Perform Testing of the Motor Systems, includes Muscle Strength testing	12	4. Perform Testing of the Motor Systems, includes Muscle Strength testing	11.40	4.25	0	30	14
5. Perform muscle strength reflexes testing	5	5. Perform Reflex Testing	8.41	3.20	0	20	5
6. Evaluate the Cerebellum and Vestibular Systems	16	6. Evaluate the Cerebellum and Vestibular Systems	14.59	4.89	0	30	15
7. Cardiovascular	5	7. Perform and/or Order Special Tests Related to the Cerebellum, Balance and Vestibular Systems (Note: Move to Case Study)*	11.68	5.34	0	30	5
8. Respiratory	4						4
9. Abdomen	3						3
10. Perform Tests Related to the Basal Ganglia	10	8. Perform Tests Related to the Basal Ganglia	9.84	3.36	0	20	10
11. Perform Tests Related to the Limbic System	5	9. Perform Tests Related to the Limbic System	7.48	3.30	0	20	5
12. Perform Cognitive Tests	6	10. Perform Cognitive Tests	7.49	3.28	0	20	6
Total	100		100.00				100
Case Study							
1. Identify Diagnosis(es), Differential Diagnosis(es), Disease Processes, Metabolic Rate, Pathways	35	1. Identify Diagnosis(es), Differential Diagnosis(es), Disease Processes, Metabolic Rate, Pathways	45				45
2. Conduct or Order Special Studies	9	2. Conduct or Order Special Studies	6				6
3. Referral	3	3. Referral	4				4

Test Specifications for the Practical Examination							
Current Test Specification		Preliminary Test Specifications Work Activity: Perform a Physical Examination.					Final Test Weights
Test Specifications	Test Weights	Test Specifications	Test Weights	SD	Min	Max	
4. Treatment and Rehabilitation	35	4. Treatment and Rehabilitation	30				30
5. Take a Patient History	8	5. Take a Patient History	5				5
6. Case PE	10	6. Case PE	10				10
Total	100		100				100

* The committee removed this component from PE, as it is not part of a physical exam. It is addressed in the case study portion of the practical exam.

**The committee allocated a weight of 10 for performing Sensory Exams and a weight of 2 for additional tests, for a total of 12.

Finalization of the Content Outline and Test Specifications

On January 31, 2019 and February 5, 2019 web-based meetings were held with the job analysis committee to review the results of the study, to finalize the work activities and content domains, and the test specifications for the written and practical examinations based on the data obtained from the study. See Appendix O for the agenda. The committee first reviewed the results of the background questionnaire and response rate for both surveys (i.e., Tables 10 through 28), and were reminded that both surveys were disseminated to all potential survey recipients. It was noted that, in general, the response patterns to the background questions were similar for the two surveys. For each background question data table presented, they were asked if the data suggested that the survey respondent group is representative of the population of DACNBs. They responded “yes” after reviewing the data tables for each background question. They noted that the majority of survey respondents are chiropractors practicing chiropractic/functional neurology on a full-time basis and have a private practice. They also noted the varying years of work experience and geographical locations, which are other characteristics that would be representative of the population of DACNBs. It was the consensus of the committee that the characteristics of the survey respondent group appeared to be reflective of the population of DACNBs.

The committee was then oriented to the qualitative and quantitative data associated with the work activities, tasks, content domains, and KSAs. They were provided instruction on how to use the validity rating data and the qualitative data (i.e., survey respondents’ comments) from the study to finalize the work activities, content domains, and test specifications. The committee was also given guidance on how to identify decision rules concerning the validity rating data that they may use to finalize the work activities (and associated tasks), content domains (and associated KSAs), and test specifications.

As a result of a review of survey respondents’ comments concerning the comprehensiveness of the work activities and content domains, and the responses to how well the job analysis represented the practice of chiropractic functional neurology, the committee decided to not make any changes to the work activities and content domains, as the data suggested that the practice of chiropractic functional neurology was well represented on the survey. In addition, after a review of the validity rating data associated with the work activities and content domains as described below, they decided to retain the work activities and content domains, as there were more than sufficient data to justify retention of all of the work activities and content domains.

Based on a review of the summary data (i.e., the data tables presenting the mean ratings, SD, minimum and maximum ratings, and N) for the importance and frequency ratings of the task statements and KSAs, the committee decided to retain all task statements that had a mean importance rating of 1.0 or higher (i.e., somewhat important or higher), coupled with a mean frequency rating of 1.0 or higher, as that indicated that the task was performed at least once or twice per year. However, the job analysis committee decided to retain tasks 2.10.2, and 2.13.13 even though the mean frequency ratings were 0.99 and 0.79, respectively. They retained the tasks, although not performed frequently, the tasks’ average importance ratings fell between somewhat important and important. With respect to the KSAs, the committee decided to apply the same decision rules when reviewing the KSAs, which resulted in retaining all KSAs as the mean importance and frequency ratings exceeded their decision rule. However, the KSAs associated with Special Studies were reviewed and it was decided that the statements were actually task statements rather than KSAs. The statements describe the types of red flags the specialist in chiropractic neurology would have

to recognize in order to decide when to order a special study, and the specificity of the type of special study that would be necessary based on the presenting case. KSAs from the other content domains would be needed in order to perform the tasks associated with special studies. For example, knowledge of 15.6 Laboratory: blood and urine test specific for the suspected disease or disorder, would be knowledge needed for ordering special studies that involve blood or urine testing. The statements underwent minor revision and were moved to the Special Studies section of the Work Activities. The committee approved the work activities (and associated task statements) and content domains (and associated KSAs) as shown in Appendix P.

The committee reviewed the current and preliminary test weights for the written and practical examinations as presented in Tables 47 – 49. When finalizing the test specifications, in addition to using the results of the job analysis study in making decisions about the test specifications, the committee was advised to take into consideration the practical aspect of test development, as the scope and depth of the subject matter should be taken into consideration when finalizing the test weights. For example, some tasks, although rated high in terms of importance and frequency may be limited in scope, or conversely some tasks may have been rated high in importance but may not be frequently performed, yet may have more breadth and depth of subject matter than a task that is important and is frequently performed. Therefore, the committee may consider adjusting the weights given these considerations.

Based on a review of the preliminary test specifications for the work activities for the written examination, the committee indicated that the preliminary test weights would need to be adjusted for practical reasons. For instance, the 3 sets of preliminary test specifications for Work Activity 1. Take a Patient History were approximately 20%. They indicated that it would be challenging to develop a sufficient number of questions that would meet the test specifications (e.g., 60 questions for a 300-item exam) for the subject matter associated with this work activity. Therefore, they reduced the test weight to 5%. Likewise, the committee decided to reduce the test specifications for Work Activity 2. Perform a physical exam from approximately 23% as suggested by the preliminary test specifications to 10%, as the types of questions that could be asked about physical examinations would be limited on a written examination, and such tasks would be assessed on the physical exam portion of the practical examination. For Work Activity 3. Conduct or Order Special Studies, the committee decided on 6% for the test specifications, as it is approximately an average of the 3 sets of preliminary test specifications. The committee did not believe that the preliminary test weights for Work Activity 4. Identify diagnosis(es), differential diagnosis(es), disease processes, metabolic rate and pathways were reflective of the breadth and depth of knowledge associated with this work activity and its importance. Therefore, they decided to set the test specifications for this work activity to 45%. For Work Activity 5. Treatment and Rehabilitation, the committee adopted 30% for its test specification, which falls within the range of the 3 sets of preliminary test specifications. Similarly, for Work Activity 6. Referral, the committee set the test specification for this work activity to 4%, which falls within the range of the 3 sets of preliminary test specifications.

As shown in Table 48, for the content domains, the committee decided to adopt preliminary test specifications #3, with rounding. As indicated previously, red flags and ethics are no longer listed as content domains, as they are subsumed among the remaining content domains. See Table 50 for the final test specifications for the written examination.

Table 45. Final Test Specifications for the Written Examination

Final Test Specifications for the Written Examination		
Work Activities	Percentage and Number of Questions	
	%	N
1. Take a Patient History	5%	15
2. Perform a Physical Exam	10%	30
3. Conduct or Order Special Studies	6%	18
4. Identify Diagnosis(es), Differential Diagnosis(es), Disease Processes, Metabolic Rate, Pathways	45%	135
5. Treatment and Rehabilitation	30%	90
6. Referral	4%	12
Total	100%	300

Final Test Specifications for the Written Examination		
Content Domains	Percentage and Number of Questions	
	%	N
1. Autonomic Nervous System	7%	21
2. Basal Ganglia	6%	18
3. Brain and Its Environment	5%	15
4. Brainstem	8%	23
5. Cerebellum	8%	25
6. Cranial Nerves	7%	21
7. Head and Face Pain	6%	18
8. Limbic System	5%	14
9. Lobes of the Brain	6%	18
10. Neuro-Endocrine System	4%	13
11. Neuron Theory	5%	16
12. Pain	8%	23
13. Peripheral Nerves	7%	22
14. Receptor Systems	6%	17
15. Reflexogenic Systems	6%	17
16. Spinal Cord	6%	19
Total	100%	300

Based on a review of the preliminary test specifications for the practical examination presented in Table 49, the committee adjusted the test specifications and test weights for the physical examination portion of the practical examination, as they believed that the adjusted weights would better reflect the importance and depth and breadth of activities associated with the components comprising the examination. They also compared the preliminary weights to the current weights in making decisions about the final weights. For “1. Obtain the Patient’s Vital Signs, the committee decided to adjust the preliminary test weight from 6.84 to 3, as they believe that the emphasis of this activity should be decreased because obtaining vital signs is a standard procedure for all chiropractors, and some chiropractors have staff obtain vital signs. The committee decided to increase the weight for “2. Perform Cranial Nerve Examinations” from 12.20 to 18, as the depth and breadth of testing, and the knowledge, skills, and abilities associated with such examinations are extensive and therefore, should be given a greater test weight. For “3. Perform Sensory Examinations,” the committee decided to increase the weight from 10.07 to 12, and allocate a weight of 10 to “perform sensory exams” and a weight of 2 to additional tests that are associated with performing motor and sensory exams for certain disorders. For “4. Perform Testing of the Motor Systems, includes Muscle Strength testing,” the committee adjusted the preliminary test weight from 11.40 to 14, as they indicated the increased weight would better reflect its importance. For “5. Perform Reflex Testing,” the committee decreased the preliminary test weight from 8.41 to 5, as the number of tests associated with this area is limited. For “6. Evaluate the Cerebellum and Vestibular Systems,” the committee simply rounded up the preliminary test weight of 14.59 to 15. For “7. Perform and/or Order Special Tests Related to the Cerebellum, Balance and Vestibular Systems,” although part of a patient examination, for the purposes of the physical examination, the committee decided to remove this component, as Special Studies is addressed in the case study. The weight that was allocated to this component was distributed among the cardiovascular, respiratory and abdomen testing, which are significant for evaluating integrity of the content domain Autonomic Nervous System and a necessity to evaluate in a thorough neurological examination. The committee decided to round up the preliminary test weight for “8. Perform Tests Related to the Basal Ganglia” from 9.84 to 10. For “9. Perform Tests Related to the Limbic System,” the committee decided to decrease the preliminary test weight of 7.48 to 5, and decrease the preliminary test weight of 7.49 to 6 for “10. Perform Cognitive Tests.” For the case study, the committee adopted the test specifications for the work activities on the written examination.

The committee also reviewed the data related to the weighting of the physical examination and case study for the practical examination (see Table 46) and decided to maintain the weighting of 50% for the physical examination and 50% for the case study. See Table 51 for the final test specifications.

Table 46. Final Test Specifications for the Practical Examination

Final Test Specifications for the Practical Examination	
Physical Examination	Test Weights
1. Obtain the Patient's Vital Signs	3
2. Perform Cranial Nerve Examinations	18
3. Perform Sensory Examinations	10
4. Perform Testing of the Motor Systems	14
5. Perform Reflex Testing	5
6. Evaluate the Cerebellum and Vestibular Systems	15
7. Cardiovascular	5
8. Respiratory	4
9. Abdomen	3
10. Perform Tests Related to the Basal Ganglia	10
11. Perform Tests Related to the Limbic System	5
12. Perform Cognitive Tests	6
13. Additional Tests	2
Total	100
Case Study	Test Weights
1. Identify Diagnosis(es), Differential Diagnosis(es), Disease Processes, Metabolic Rate, Pathways	45
2. Conduct or Order Special Studies	6
3. Referral	4
4. Treatment and Rehabilitation	30
5. Take a Patient History	5
6. Case PE	10
Total	100

Eligibility and Recertification Requirements

Survey respondents were asked if they believe that the eligibility requirement (see below) to take the examination are necessary to achieve competence as a DACNB. As indicated in Table 52, the majority (approximately 94%) agreed with the eligibility requirements. For the survey respondents who indicated that they did not agree with the eligibility requirements, they were presented with a question asking them to provide a reason for not agreeing with the requirements. See Appendix Q for survey respondents' reasons as to why they didn't agree with the eligibility requirements.

Eligibility Requirements

Eligibility requirements:

- Hold the degree of Doctor of Chiropractic, or an equivalent doctorate degree in medicine or osteopathy, and
- Is duly licensed or registered in their state or country, from a CCE accredited college (USA) or its equivalent.
- The candidate must also show evidence of having successfully completed a post-doctoral program in neurology of at least 300 credit hours from a chiropractic college, university, institution, foundation or agency whose program is approved by the continuing education committee of the Commission for the Accreditation of Graduate Education in Neurology (CAGEN).
- The Chiropractic College, organization, institution, foundation, or agency from which the applicant has completed his/her course of study must certify to the Board that the applicant has satisfactorily completed at least 300 credit hours of postdoctoral instruction in neurology.
- The candidate must possess a medical license or other clinical license that permits diagnosing and treating patients by the laws in the jurisdiction where the individual practices and be in good standing with the respective licensing/registration agency.

Table 47. Eligibility Requirements

In your opinion, do you believe that the eligibility requirements listed above are necessary for achieving competence as a DACNB?				
Response	Work Activity Survey		Content Domain Survey	
	N	%	%	N
No	10	5.52%	10	6.67%
Yes	171	94.48%	140	93.33%
Total	181	100.00%	150	100.00%

Recertification Requirements

Survey respondents were asked if they believe that the recertification requirement (see below) are necessary to achieve competence as a DACNB. As indicated in Table 53, the majority (approximately 83%) agreed with the recertification requirements. For the survey respondents who indicated that they did not agree with the recertification requirements, they were presented with a question asking them to provide a reason for not agreeing with the requirements. See Appendix Q for survey respondents' reasons as to why they didn't agree with the recertification requirements.

Annual Recertification Requirements:

- Proof of attendance for at least 30 hours of continuing education from an approved source
- A bibliography listing of at least 24 neurology related journal articles from peer reviewed publications (please put your name on the document and number the citations)
- A copy/image/picture of your unexpired DC or medical license uploaded to your profile

Table 48. Recertification Requirements

In your opinion, do you believe that the recertification requirements listed above are necessary for achieving competence as a DACNB?				
Response	Work Activity Survey		Content Domain Survey	
	N	%	N	%
No	32	17.68%	24	16.00%
Yes	149	82.32%	126	84.00%
	181	100.00%	150	100.00%

Summary and Recommendations

Using job (practice) analysis data as a basis for developing a content outline (i.e., work activities and content domains) and test specifications will contribute to the validity of the examination. As described in this report, the job analysis data were used to validate the contents of the draft content outline and draft test specifications, and produce preliminary test weights for the written and practical examinations. The results were used and considered by the ACNB in the finalization of the content outline and test specifications. Data were also collected to validate the eligibility and recertification requirements. The final determination of the changes to the job analysis (i.e., content outline and test specifications) and the requirements for the certification program are determined by the ACNB.

Appendix A. Psychometrician's qualifications

Dr. Freilicher has a Ph.D. in Measurement and Evaluation from Columbia University. Her doctoral dissertation was on passing point methodology (i.e., Freilicher, T.M. (2005). A comparison study of standard setting methods using test score data for a medical competency simulation examination (Doctoral dissertation, Columbia University, 2005). ProQuest Information and Learning Company, UMI Number 3159737). She has more than 30 years of experience developing certification, licensure, and employee selection examination programs for a variety of domestic and international professional organizations and/or regulatory agencies. She has extensive experience conducting job analyses, developing competency frameworks, test specifications, item and exam development, and standard setting. Dr. Freilicher has managed the development and implementation of high-stakes and large-scale exam programs. She assists certifying bodies in addressing testing industry and/or accreditation standards (e.g., APA, EEOC, ANSI, NCCA) for their certification examinations.