2023 Test Specifications Report

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American Chiropractic Board of Sports Physicians™ (ACBSP™) Certified Chiropractic Sports Physician® (CCSP®) Exam

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Executive Summary

This report describes the process of designing exam specifications for the Certified Chiropractic Sports Physician™ (CCSP®) exam offered by American Chiropractic Board of Sports Physicians® (ACBSP™). It utilizes the results of an empirical job analysis study, based on the robust and well-recognized task inventory methodology, to recommend the specifications for an exam that produces reliable scores and valid interpretations for the CCSP® credential.

The exam design process has two primary considerations at this point: the number of items on the exam, and the distribution of content that should be covered. The number of items for the exam has already been established, as this is an existing certification. The distribution of content based on the new job analysis will be the focus of this report. The final goal is to produce an exam that differentiates between candidates that meet minimum standards for the ACBSP™ CCSP® credential and those that do not.

The Validity Argument

Validity refers to whether there is evidence to support given interpretations of exam scores. The modern conceptualization of validity views is from an argumentative perspective (Kane, 1992; 2004). There are several types of validity, each contributing to the overall quality of the exam. Professional credentialing exams rely on content validation.

In the case of professional certification testing, the intended interpretation of the resulting scores on the exam is that someone who passes the exam has a certain level of knowledge and skill required to do a job adequately. To meet this goal, and to provide evidence of validity, a job analysis is performed. Results from the job analysis provide evidence that the exam assesses the appropriate skills that are required to perform the job successfully and perform a scientific analysis of what the job entails to adequately design an exam to assess skills for the job.

Once the appropriate skills and tasks have been defined, the next step in the process is to translate the results of the job analysis into exam specifications of blueprints. This provides an empirical link from the design of the exam to the structure of the profession. The National Commission for Certifying Agencies (NCCA), which accredits certification testing organizations, requires supporting evidence that test specifications have been properly established. More specifically, Standard 15 outlined by the NCAA states "*The certification program must establish specifications that describe what the examination is intended to measure as well as the design of the examination and requirements for its standardization and use, consistent with the stated objectives of the certification program".*

As above, to provide a psychometrically sound foundation for the development of a certification exam, a job analysis study must first be conducted to provide supporting evidence that the exam meets the content necessary to provide meaningful interpretation of scores. The ACBSP™ has successfully completed the job analysis, which is the first step in the evidential process. This report presents a summary of those results and makes recommendations for the specifications of the exam based on the findings.

Content Distribution

The content distribution for the examination is based on the results of a job analysis study. There are several designs available (Brannick & Levine, 2002) for a job analysis study; a model commonly used for credentialing exams is a task inventory (Raymond & Neustel, 2006). The goal of this approach is to produce a comprehensive list of professional tasks, skills, and knowledge performed and/or utilized on the job, then have a wide range of incumbents rate each task or statement on aspects such as importance and frequency of the task or statement in a normal work week. This provides empirical evidence as to which tasks and statements are more important or more frequent in the job; those tasks or statements should obviously have more weight on the final exam than rare or unimportant tasks. This section described the analysis to determine the content weights.

As described in the job task analysis report, a panel of experts reviewed the domains and tasks from the previous job analysis and made several updates regarding current practice. The final list of 82 tasks was delivered via an online survey, with 171 respondents completing at least 80% of the survey.

The mean and standard deviation of both frequency and importance ratings was calculated for each task/statement. In addition, mean frequency and importance were combined with a multiplicative model (I x F) and additive model (I + F), as mentioned in Raymond and Neustel (2006). These are indices of the significance of the task. Table 1 presents the means of these indices for each of the domains, and the number of tasks included in the final survey. A full list of the mean frequency and importance ratings is available in the job analysis report.

Table 1. Task statement rating means for content areas

Domain		Total Tasks	Mean Imp.	Mean Freq.	Mean I + F	Mean I x F
A.	Team Physician and Events	14	3.88	2.56	6.44	10.09
B.	Evaluate and Manage Concussions	4	4.43	2.76	7.19	12.26
C.	Clinical Biomechanics	6	4.11	3.43	7.54	14.21
D.	Sports Nutrition	6	3.33	2.22	5.55	7.56
E.	The Environment and the Athlete	4	4.04	2.71	6.74	11.07
F.	Medical Legal Aspects	11	4.59	3.99	8.58	18.46
G.	Diagnosis of a Sports Injury	6	4.58	3.95	8.53	18.27
H.	Treatment of Sports Injuries	5	4.72	4.3	9.02	20.3
I.	Adjunctive Therapies	6	4.46	3.93	8.38	17.61
J.	Prevention of Sports Injuries	3	4.32	3.64	7.96	16.1
K.	Diagnostic Imaging	4	4.07	2.87	6.94	11.71
L.	Emergency Procedures	7	4.57	2.15	6.72	9.82
M.	Special Clinical Considerations	6	4.23	2.63	6.86	11.17
	Overall Means	82	4.26	3.16	7.42	85.85

In terms of designing exam specifications, the indices in Table 1 do not consider one important piece of information: the content area size (the number of task statements within each domain). Content areas with more statements will simply require more items on an exam to cover their content than areas with relatively few statements.

Table 2 presents the indices that take content area size into account, by presenting the sum of each index. It also provides the percentage weight that would be resulting from each approach. Note that the differences between the two approaches are relatively small across all the domains. The largest percentage difference is found in the *Medical Legal Aspect* domain, which indicates an increase of approximately 2.50% more items in this domain.

Table 2. Task statement rating means for content areas

Domain		Sum I + F	Percent I + F	Sum I x F	Percent I + F	Difference
A.	Team Physician and Events	90.20	14.90	141.33	12.66	2.24
B.	Evaluate and Manage Concussions	28.76	4.75	49.03	4.39	0.36
C.	Clinical Biomechanics	45.24	7.48	85.29	7.64	-0.17
D.	Sports Nutrition	33.27	5.50	45.37	4.07	1.43
E.	The Environment and the Athlete	26.96	4.45	44.29	3.97	0.49
F.	Medical Legal Aspects	94.38	15.60	203.02	18.19	-2.60
G.	Diagnosis of a Sports Injury	51.16	8.45	109.64	9.82	-1.37
H.	Treatment of Sports Injuries	45.10	7.45	101.50	9.09	-1.64
I.	Adjunctive Therapies	50.31	8.31	105.65	9.47	-1.15
J.	Prevention of Sports Injuries	23.86	3.94	48.31	4.33	-0.39
K.	Diagnostic Imaging	27.77	4.59	46.84	4.20	0.39
L.	Emergency Procedures	47.04	7.77	68.71	6.16	1.62
M.	Special Clinical Considerations	41.14	6.80	67.03	6.01	0.79
	Totals	605.19	100.00	1116.01	100.00	

Table 3 converts the information in Table 2 above into exam specification numbers, assuming a 200-item exam. The proposed exam plans by model can be seen in the final column of Table 3 for both the additive and multiplicative models.

Evaluation of the resulting item counts indicates that there are some differences in the item counts between the additive and multiplicative model. For example, there are 4 more items in the *Team Physician and Event* domain for the I + F model versus the I x F model. This trend is also seen in the *Emergency Procedures* item differences. Conversely, there are 5 more items in the *Medical Legal Aspects* domain for the multiplicative model versus the summative model.

A review of the weightings across both models considering the job analysis results should be conducted to evaluate if one of these models is preferable given substantive input from content experts.

Table 3. Potential exam specifications for the CCSP® based on empirical data

	Domain	Items	Items
		I + F	I x F
A.	Team Physician and Events	29	25
B.	Evaluate and Manage Concussions	10	9
C.	Clinical Biomechanics	15	15
D.	Sports Nutrition	11	9
E.	The Environment and the Athlete	9	8
F.	Medical Legal Aspects	31	36
G.	Diagnosis of a Sports Injury	17	20
H.	Treatment of Sports Injuries	15	18
I.	Adjunctive Therapies	17	19
J.	Prevention of Sports Injuries	9	9
K.	Diagnostic Imaging	9	8
L.	Emergency Procedures	16	12
M.	Special Clinical Considerations	14	12
	Totals	200	200

Items written for exam forms should adhere as closely as possible to the chosen outline (I + F or I x F) to maintain content validity. The writing of items for specific statements, especially statements with higher ratings, will enhance the content validity. If working with a task, an important step in item writing is to consider the knowledge, skills, and abilities (KSAs) needed to do a task, then utilize that in developing an item. Some job analysis methods utilize extensive explicit mapping between tasks and KSAs. The methodology here still considers that linkage important, but it takes place at the item writing level rather than the job analysis level. That is, when writing an item, the expert should evaluate the KSAs they consider relevant to a given task or content area, then write items accordingly. This method also allows the item writers to focus more on job tasks rather than more text-book style knowledge, and thereby better assess competence on the job.

Summary

This report describes the development of exam specifications for the CCSP® exam offered by American Chiropractic Board of Sports Physicians® (ACBSP™). The goal of the study was to recommend the content distribution of items on the exam based on the empirical results of the job task analysis survey. The recommended exam plan for both an additive and multiplicative model is provided in Table 3. Given these results and taking into consideration the results from the job analysis that show the relative importance and frequencies of each task, it is recommended that the multiplicative model results be used to facilitate the new blueprint. However, the final decision rests upon a committee of subject matter experts, and they might consider additional aspects necessary to obtain sufficient content coverage across domains.

References

Brannick, M.T., & Levine, E.L. (2002). *Job Analysis*. Thousand Oaks, CA: Sage.

Kane, M. (1992). An argument-based approach to validity. *Psychological Bulletin, 112*, 527-535.

Kane, M. (2004). Certification testing as an illustration of argument-based validation. *Measurement: Interdisciplinary Research and Perspectives, 2*, 135-170.

Raymond, M. & Neustel, S. (2006). Determining the content of credentialing examinations. In Downing, S.M., & Haladyna, T.M. (Eds.) *Handbook of Test Development*. Mahwah, NJ: Erlbaum.

Addendum

See the attached addendum for an update to the proposed test specifications. These changes were made in light of expert opinion, guided by the empirical data. These changes are valid and defensible given the given rationale and description of the use and purpose of the exam.

On Tuesday, July 25th, 2023, the Job Task Analysis (JTA) Committee leadership team met to discuss the CCSP® Job Task Analysis (Table 1.) The 2023 Test Specification report, written by ASC, identified an issue with the possible test plan that the model I x F had a large number of items in the Medical Legal Aspects category. The JTA leadership team agreed that the number of items in the Medical Legal Aspects category was not representative of what a CCSP® job tasks are and that the test plan would need to be adjusted.

Table 1: Job Task Analysis Committee Leadership Team participants for the July 25th, 20023 meeting

NAME	Location
Dr. Holly Westbrock	Minnesota
Dr. Scott Vanina	Pennsylvania
Dr. Paul Hackett	Toronto
Dr. Mahelani Schreindorfer	California
Dr. Jordan Knowlton-Key	New York

The JTA leadership team began by reviewing the tasks in the Medical Legal Aspects category (Table 2.) The leadership team discussed that several of the tasks could be rewritten to be combined into a single task. For example, the tasks "Communicate and meet with families," "Communicate with coaches," and "Communicate with athletes" could all be combined into one task and read: Communicate with athletes, coaches and families. During this meeting, other tasks in the Medical Legal Aspects category were deemed to be nonspecific to a CCSP®, that any Doctor of Chiropractic (DC) would need to know and follow these tasks. For example, "Maintain malpractice insurance" must be followed by all DC's and is not specific to a CCSP® and therefore should be eliminated as a task in the Medical Legal Aspects category.

Table 2: Medical Legal Aspects Category Tasks in the 2023 CCSP® Job Analysis Report

CATEGORY	TASK
F. Medical Legal Aspects	Communicate and meet with families
	Communicate with coaches
	Communicate with athletes.
	Provide informed consent information/documentation
	Maintain documentation
	Maintain malpractice insurance
	Attend continuing education
	Know areas of negligence in sport
	Follow the ACBSP's™ ethics policies
	Follow SafeSport or equivalent guidelines
	Know the scope of practice in the state of licensure

The leadership team identified 7 tasks that could be eliminated or combined from the tasks listed in Table 2. The leadership team proposed the following Medical Legal Aspects category task list (Table 3) as a more representative task list specific to a CCSP®.

Table 3: Proposed Medical Legal Aspects Category Tasks

CATEGORY	TASK
F. Medical Legal Aspects	Communicate and meet with athletes, coaches, and families
	Know areas of negligence in sport
	Follow the ACBSP's™ ethics policies
	Follow SafeSport or equivalent guidelines

From the I x F model (Table 3) in the 2023 CCSP® Test Specifications report, the Medical Legal Aspects category has 36 items. From the 2023 CCSP® Job Task Analysis report (pg 19) the Medical Legal Aspects category has 11 tasks. This means that each task in the category represents 3.27 items on the written examination. The leadership team agreed that for each of the tasks that was eliminated from the original task list, 3 items would be removed from the I x F model. The leadership team eliminated 7 tasks, multiplied by 3 items and agreed that 21 items should be removed from the Medical Legal Aspects category from the I x F model, leaving 15 items in that category.

The 21 items that needed to be redistributed were discussed by the JTA leadership team. The group identified that the CCSP® test plan did not have enough items in 5 categories (Diagnosis, Treatment, Prevention, and Imaging) and that the 21 items should be redistributed into these 4 categories. The subject matter experts (SME's) who did the redistribution and panel review of the proposed test plan are in Table 4.

Table 4: SME's who participated in redistribution of the 21 items and panel review of the proposed test plan.

NAME	Location
Dr. Leon Tom	Texas
Dr. Lakia Brown	Indiana
Dr. Peggy Chin	California
Dr. Mahelani Schreindorfer	California
Dr. Jordan Knowlton-Key	New York

Table 5 describes the SME's discussion and redistribution of the 21 items. Each SME submitted what they thought the redistribution should look like and then the averages were taken and added to the proposed test plan in Table 6.

Table 5: SME's redistribution data and averages for the 21 items to be redistributed.

CCSP® Category	Dr. A	Dr. B	Dr. C	Dr. D	Average # of Additional Items in Each Category	Rounded # of Additional Items in Each Category	Notes
Diagnosis of a Sports Injury	9	8	10	8	8.75	9	
Treatment of a Sports Injury	5	6	6	8	6.25	6	
Prevention of a Sports Injury	5	4	3	2	3.5	4	Rounded up since each doctor suggested a higher # of items in this category as compared to the Imaging category
Diagnostic Imaging	2	3	2	3	2.5	2	Rounded down since each doctor suggested a lower # of items in this category as compared to the Prevention category
					TOTAL	**21**	

Table 6 describes the proposed CCSP® Test Plan based upon the 2023 Job Task Analysis and SME panel. The redistribution of the 21 items are shown in bold. The SME's agree that the Proposed Test Specifications in Table 6 more accurately represent the tasks of a CCSP® as compared to the I x F model.

Table 6: Proposed CCSP® Test Specifications including the redistribution of 21 items from Medical Legal Aspects.

	Category	I x F (SME's did not support)	Proposed Test Specifications (supported by SME's)
A.	Team Physician and Events	25	25
B.	Evaluate and Manage Concussions	9	9
C.	Clinical Biomechanics	15	15
D.	Sports Nutrition	9	9
E.	The Environment and the Athlete	8	8
F.	Medical Legal Aspects	**36**	**15**
G.	Diagnosis of a Sports Injury	**20**	**29**
H.	Treatment of a Sports Injury	**18**	**24**
I.	Adjunctive Therapies	19	19
J.	Prevention of Sports Injuries	**9**	**13**
K.	Diagnostic Imaging	**8**	**10**
L.	Emergency Procedures	12	12
M.	Special Clinical Considerations	12	12
	TOTALS	**200**	**200**

ASC ACKNOWLEDGEMENT AND SUPPORT FOR CHANGES

Given the results from the job analysis, expert opinions of the subject matter experts for CCSP ASC believes that the proposed changes to the CCSP blueprint accommodates the test purpose and rationale. Following, the evaluation of the empirical data combined with the knowledge base of the SMEs who have reviewed the outcomes of the job analysis warrants the proposed changes. The final test blueprint can be viewed in the following table and overrides the originally proposed test blueprint given in the original job analysis.

Table 7. Final Test Specifications, CCSP

	Category	Proposed Test Specifications (empirical data and SME expert opinion)	Percent of exam
A.	Team Physician and Events	25	13%
B.	Evaluate and Manage Concussions	9	5%
C.	Clinical Biomechanics	15	8%
D.	Sports Nutrition	9	5%
E.	The Environment and the Athlete	8	4%
F.	Medical Legal Aspects	**15**	8%
G.	Diagnosis of a Sports Injury	**29**	15%
H.	Treatment of a Sports Injury	**24**	12%
I.	Adjunctive Therapies	19	10%
J.	Prevention of Sports Injuries	**13**	7%
K.	Diagnostic Imaging	**10**	5%
L.	Emergency Procedures	12	6%
M.	Special Clinical Considerations	12	6%
	TOTALS	**200**	**100%**