

ORIGINAL RESEARCH

Developing Content Weights for the 2026 Sports Medicine Blueprint

Ting Wang, PhD¹, Thomas R. O'Neill, PhD¹, Bradley G. Changstrom, MD^{1,2}, Prasad Chodavarapu, MS¹, James C. Puffer, MD^{1,3}, Warren P. Newton, MD, MPH¹

¹ The American Board of Family Medicine, ² School of Medicine, University of Colorado, ³ David Geffen School of Medicine, University of California, Los Angeles

<https://doi.org/10.3122/jabfm.2025.250293R1>

Journal of the American Board of Family Medicine

Vol. 39, Issue 1, 2026

Introduction: The Certificate of Added Qualification in Sports Medicine is administered by the American Board of Family Medicine (ABFM) and cosponsored by the American Board of Emergency Medicine (ABEM), the American Board of Pediatrics (ABP), and the American Board of Physical Medicine and Rehabilitation (ABPMR). This article reviews the methodology used to determine the weighting of CAQSM assessments across five content domains.

Methods: A survey was comprised of 231 sports medicine clinical activities asking respondents to rate how often they perform a clinical activity (the Frequency Index- FI) and to rate the level of risk to the patient if the condition is misdiagnosed or not managed properly (the Index of Harm-IoH). A random sample of 800 diplomates representing Sports Medicine Diplomates from five member boards was selected to participate. Rasch modeling was employed to analyze the survey results. The sports medicine advisory committee voted to equally balance FI+IoH survey results to weight the content domains.

Results: The survey response rate was 42.2%. Survey respondents were demographically representative of the overall sampling frame across key variables, except for primary certifying board. Weights for the content domains were as follows: Musculoskeletal Conditions (32.1%), Medical Conditions (30.2%), Care of Emergency Conditions (22.4%) and Preventive Aspects of Sports Medicine (10.4%).

Discussion: This is the first nationally representative survey of sports medicine clinical activities performed in the United States. This survey data was used to develop a new sports medicine blueprint. In the future, this data may be used to develop curriculum or assessments.

Keywords: Athletic Injuries, Certification, Clinical Competence, Examination Questions, Licenses, Program Evaluation, Psychometrics, Quantitative Research, Specialty Boards, Sports Medicine

Introduction

In 2023, the Sports Medicine Advisory Committee approved an updated blueprint for the Sports Medicine Examination, scheduled for implementation in 2026. The Sports Medicine Advisory Committee is comprised of representatives of the administrative board (American Board of Family Medicine), the cosponsoring boards (American Board of Pediatrics, American Board of Physical Medicine and Rehabilitation, and American Board of Emergency Medicine), representatives of the American Medical Society for Sports Medicine (AMSSM), and a public member with an extensive understanding of the practice of sports medicine. This committee oversees the work of the Sports Medicine Assessment Committee, reviews the blueprint, and approves the passing standard for the sports medicine assessments.

This revised blueprint aligns examination content more closely with contemporary clinical practice. The blueprint serves as a critical framework for examinations, defining the content domains assessed and the percentage of exam questions allocated to each domain. In this manuscript, we describe the methodology used to determine the appropriate weighting of exam questions across the five content domains (shown below) approved by the Sports Medicine Advisory Committee.

- *Domain I: Foundations of Practice*
- *Domain II: Preventive Aspects of Sports Medicine*
- *Domain III: Care of Emergency Conditions*
- *Domain IV: Diagnosis, Management, and Epidemiology of Sports- and Exercise-Related Musculoskeletal Conditions*
- *Domain V: Diagnosis, Management, and Epidemiology of Sports- and Exercise-Related Medical Conditions*

Domain I (Foundation of Practice) was the only content domain not defined by specific, observable clinical activities; therefore, its weighting could not be determined empirically. Instead, the Sports Medicine Advisory Committee relied on expert judgment to assign it a fixed weight of 5%. In contrast, the remaining four clinical content domains contained observable clinical activities, enabling an empirical approach. Initial weights for these domains were established based on the total number of distinct clinical activities included within each domain. These initial percentages were subsequently refined using two key factors:

1. The frequency with which Sports Medicine physicians from various specialties perform these clinical activities.
2. The potential risk of patient harm if an activity is performed incorrectly or inadequately.

The process of determining the final weights for the content domains involved two analytical phases.

- In Phase 1 (Representative Data Sample), Data were collected from a representative sample of physicians certified through previous Sports Medicine (SPMED) examinations across four American Board of Medical Specialties (ABMS) member boards, including the American Board of Family Medicine (ABFM), the American Board of Emergency Medicine (ABEM, including physicians initially certified through the American Board of Internal Medicine (ABIM)), the American Board of Physical Medicine and Rehabilitation (ABPMR), and the American Board of Pediatrics (ABP). These physicians provided ratings on the frequency of performing clinical activities and the potential risk of patient harm associated with these activities if performed incorrectly or inadequately.
- In Phase 2 (Content Domain Weights), the collected ratings were analyzed to assign specific weights to each clinical activity. These weights were then used to refine and finalize the proportional distribution of exam questions across the content domains.

Method: Representative Data Sample

Survey

The survey was comprised of the 231 clinical activities grouped in the clinical content domains as specified above. For each activity, respondents were instructed to provide two ratings. The first was to rate how often they expect to perform the activity using a 5-point Likert scale (Daily, Weekly, Monthly, Few Times Per Year, Rarely or Never).¹ The second was to rate the general level of risk to the patient if the condition is misdiagnosed or not managed properly, using a 4-point Likert scale (Minimal, Moderate, Considerable, Extreme).¹

Sampling Frame

A sampling frame is a comprehensive list representing the population from which a sample is randomly selected. In

this study, the sampling frame included all currently certified Sports Medicine Diplomates from five ABMS member boards: ABFM, ABEM, ABIM, ABPMR, and ABP. Physicians were excluded if they were initially certified in 2024 or later, scheduled to lose certification by December 31, 2024, clinically inactive (ABFM only), declined email contact (ABFM only), or lacked a valid email address (ABFM only). After applying these criteria, the final sampling frame consisted of 4,791 eligible physicians.

Sample

From this sampling frame, a random sample of 800 diplomates was selected and invited to participate in the survey. Prior to distributing invitations, demographic characteristics of the selected sample—including race/ethnicity, certifying board, gender, medical school origin (US or International), medical degree (MD, DO, or other), and initial certification year—were compared against the full sampling frame to ensure representativeness.

Survey Administration

Invitations to participate in the survey were emailed to the selected diplomates on January 22, 2025. The survey was estimated to require approximately 30 to 45 minutes to complete. Incentives varied by certifying board: ABFM diplomates received 5 certification points toward their certification along with a \$200 honorarium; ABEM diplomates received a \$200 stipend; no incentives were offered to ABPMR or ABP diplomates. A total of six reminder emails were sent between January 22 and February 24, 2025, to diplomates who had not yet responded. Additionally, the survey deadline was extended three times to improve response rates.

Institutional Review Board (IRB)

The study procedures were reviewed by senior ABFM executive staff to verify compliance with ABFM privacy policies. Additionally, the American Academy of Family Physicians Institutional Review Board determined that the study met criteria for IRB exemption.

Method: Content Domain Weights

The frequency and risk-of-harm ratings from the survey were analyzed separately using a Rasch rating scale model to produce two interval-level scales: the Frequency Index (FI) and the Index of Harm (IoH).² The Index of Harm has been used previously with ABFM blueprint validity studies.³⁻⁵ Rasch modeling was employed due to its ability to generate interval scales that are independent of individual raters' baseline rating tendencies, thus enabling unbiased and meaningful comparisons across clinical activities.

More specifically, the model is described as

$$\ln \left(\frac{P_{nik}}{P_{ni(k-1)}} \right) \equiv B_n - D_i - F_k$$

where:

Paik is the probability that Rater n when rating Activity

Table 1. American Board of Family Medicine (ABFM) 2025 Blueprint Survey Response Rate Summary.

Step	Numerator (Count)	Denominator (Count)	Pass Rate
Total Invited Participants	800		
Invalid Email Addresses (exclude)	12		
Ineligible Participants (exclude)	2		
Eligible Invitees	786		
Completed Survey		337	
Rater Quality Control (exclude)		5	
Final Completed Survey		332	332/786 = 42.2%

i would select Rating Category k , $P_{mi(k-1)}$ is the probability that the rater would select Rating Category $k - 1$, B_n is the severity of Rater n , D_i is the difficulty of endorsing Activity i , F_k is the difficulty of endorsing Rating Category k relative to Rating Category $k - 1$, where the categories are numbered $0, m$.

Rater Quality Control

To ensure data quality, raters whose responses substantially deviated from model expectations were identified using an outfit mean square statistic (≥ 2.75) on the risk-of-harm ratings. Both the frequency and risk-of-harm datasets were reanalyzed after excluding these misfitting raters.

Adjusting the Weights for Each Clinical Activity

The baseline percentage of questions recommended for each of the four clinical content Blueprint domains was initially determined by counting the number of clinical activities within each domain, with equal weight assigned to each activity. To refine these weights, the survey collected ratings on both the frequency of performing each clinical activity and the associated risk of patient harm from a random sample of Diplomates. The sports medicine advisory committee voted on the weights. The expert opinion on the advisory committee had a consensus that equal weights should be assigned to both the frequency of performing each clinical activity and the associated risk of patient harm with each clinical activity. The conclusion was that neither frequency nor risk of harm could be judged to be more important than the other.

From these data, three additional sets of clinical activity weights were created:

1. Frequency-based weights (FI): Frequency ratings from the survey were analyzed using the Rasch model, producing a frequency scale. Since the Rasch-derived scale had an arbitrary zero origin, a constant was added to ensure all resulting weights were positive. These adjusted values were normalized (divided by their sum and multiplied by 100) so that the total FI weights equaled 100.
2. Risk-of-harm-based weights (IoH): The risk-of-harm ratings were similarly analyzed with the Rasch model to create a risk scale. Like the FI weights, a constant

was added to shift the scale positively, and the resulting values were normalized, again summing to 100.

3. Combined FI and IoH weights: A third set of weights was calculated by averaging the normalized FI and IoH weights, equally balancing (50%) considerations of frequency and risk of harm.

These three empirically derived sets of weights were subsequently adjusted to fit within a 95% weighting framework, accommodating the predefined 5% allocated to the *Foundation of Practice* domain. This adjusted framework provided alternative approaches to baseline weighting, further enhancing alignment of exam content with actual clinical practice patterns and patient safety considerations.

Results: Representative Data Sample

Response Rate

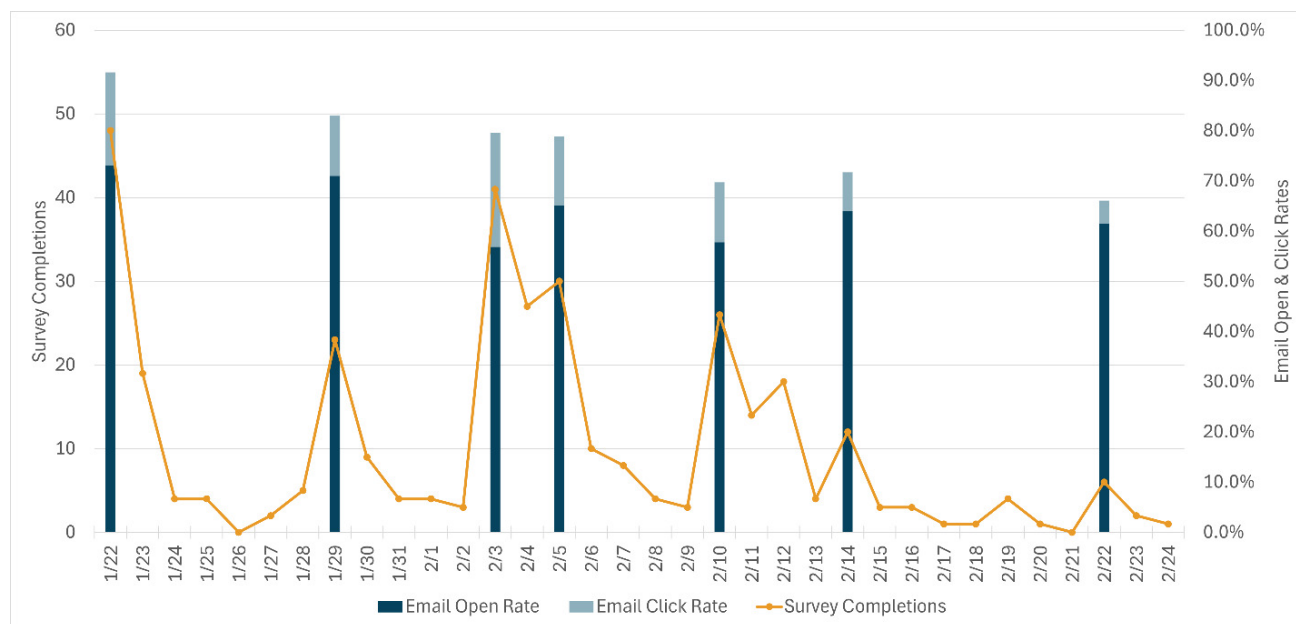
After 34 days, the survey window closed ([Figure 1](#)). Among the 800 invited participants, 12 had invalid email addresses, and 2 became ineligible as they lost their certification during the survey window, leaving 786 eligible invitees. Of these, 337 completed the survey. However, a quality control check using misfit analysis identified five respondents whose answers suggested careless responding by misfit statistics. After excluding these cases, the final adjusted response rate was 42.2% ([Table 1](#)).

Rater Quality Control

A quality control check was performed on the risk-of-harm ratings by comparing each rater's responses to the overall risk hierarchy, which was stable across most physicians. Because this hierarchy is broadly shared regardless of individual scope of practice, substantial deviations from it suggest inattentive or invalid responses. We defined misfit as an outfit mean square statistic ≥ 2.75 , a threshold for detecting extreme outliers in Rasch-based analyses used in developing Sports Medicine Certification Examination (SMCE) blueprint. Applying this criterion led to the exclusion of five respondents.

Although a parallel analysis for frequency ratings was considered, variability in clinical scope makes it difficult to distinguish genuine differences in frequency from careless responses. Consequently, the same five misfitting raters

Figure 1. Email Open & Click Rate by Day for the Sports Medicine Blueprint Survey.



identified through the risk-of-harm analysis were also excluded from the entire dataset, thus reducing the final response rate.

Representativeness of the Responding Raters

A key consideration in practice analysis/job analysis is whether respondents adequately represent the overall sampling frame. To address this concern, we conducted χ^2 tests of independence comparing survey respondents to the sampling frame across Race, Ethnicity, Gender, IMG Status, and Degree Type. None of these demographic comparisons reached statistical significance, indicating that survey respondents closely matched the sampling frame on these variables. The only statistically significant difference occurred for the certifying board, reflecting the differential incentives described in the Methods section (Table 2). Consequently, the 322 raters who provided complete and valid responses appear broadly representative of the sampling frame, suggesting minimal nonresponse bias for the evaluated demographic variables.

Results: Content Domain Weights

Table 3 (supplement) summarizes the frequency of all 231 clinical activities from the sports medicine clinical activities survey. The frequency represents the weighted values based on frequency ratings—not the raw frequency. In practice analysis, “frequency” values are produced by a Rasch rating-scale model that translates ordinal frequency ratings (e.g., never → very often) into an interval logit scale. The model estimates each activity’s location on a latent frequency/importance continuum while accounting for rater severity and category step thresholds, so the resulting numbers are weighted, relative measures—not raw counts or absolute occurrence rates. The purpose of using Rasch

modeling here is to derive the *relative importance* of each activity based on frequency—not to estimate their absolute frequency. An activity with a higher logit simply means it is endorsed, on average, at higher frequency relative to other activities in this sample, holding the rating-scale structure constant. Building on this, we linearly rescaled the Rasch measures into percentage weights so that the set of all existing activities sums to 100%; for the final blueprint, we then proportionally adjusted those weights to sum to 95% to reserve a fixed 5% for Foundations of Care. These percentages should be interpreted as normalized, comparative weights suitable for blueprinting and prioritization—not as direct estimates of how often activities occur in practice. To our knowledge, this is the first published data of the relative frequency of clinical activities in sports medicine practice.

Table 4 summarizes the distribution of examination questions across content domains. The Clinical Activities column reports the total number and corresponding percentage of clinical activities assigned to each domain (excluding Foundations of Practice), reflecting domain weights based solely on equal weighting without adjustments for frequency or risk factors. The *Foundations of Practice* domain was assigned a fixed 5% weight based on policy, as it does not include observable clinical activities. Consequently, empirically derived weights for the remaining four domains were proportionally adjusted to collectively represent the remaining 95% of the examination. The subsequent columns report three empirically derived weighting schemas described in the methods section: Frequency Index (FI), Index of Harm (IoH), and combined Frequency and Index of Harm (FI + IoH), and The final column, labeled “Proposed Approval Version,” provides the recommended domain weights based on an equal weighting of frequency and risk-of-harm indices (FI + IoH). Minor discrepancies

Table 2. Representative of Survey Responders to the Sampling Frame.

Category	Category Value	Sampling Frame		Completed and Valid Responses		p-value
		N	%	N	%	
Race/Ethnicity	Missing	1473	30.8	60	18.1	p = 0.34
	American Indian or Alaska Native	6	0.1	0	0.0	
	Asian	416	8.7	25	7.5	
	Black or African American	147	3.1	10	3.0	
	Hispanic/Latinx	64	1.3	3	0.9	
	Middle Eastern or North African	19	0.4	1	0.3	
	Multi-racial	53	1.1	3	0.9	
	Native Hawaiian or other Pacific Islander	11	0.2	0	0.0	
	Other race	103	2.2	4	1.2	
	Prefer not to answer	58	1.2	4	1.2	
	White	2441	51.0	222	66.9	
Total	4791	100.0	332	100.0		
Board	American Board Emergency Medicine (ABEM)	589	12.3	32	9.6	p < 0.001
	American Board Family Medicine (ABFM)	3054	63.8	253	76.2	
	American Board Pediatrics (ABP)	369	7.7	24	7.2	
	American Board Physical Medicine and Rehabilitation (ABPMR)	779	16.3	23	6.9	
	Total	4791	100.0	332	100.0	
Gender	Female	1274	26.6	87	26.2	p = 0.66
	Male	3276	68.4	232	69.9	
	Missing	176	3.7	11	3.3	
	Other	65	1.4	2	0.6	
	Total	4791	100.0	332	100.0	
Medical School	International Medical Graduate (IMG)	573	12.0	34	10.2	p = 0.42
	Missing	268	5.6	15	4.5	
	United States Medical Graduate USMG	3950	82.5	283	85.2	
	Total	4791	100.0	332	100.0	
Degree	Missing	14	0.3	1	0.3	p = 0.74
	DO	1090	22.8	63	19.0	
	MBBCH	1	0.0	0	0.0	
	MBBS	13	0.3	1	0.3	
	MBCHB	2	0.0	0	0.0	
	MD	3671	76.6	267	80.4	
	Total	4791	100.0	332	100.0	
Initial Certification Year	1993	59	1.2	7	2.1	p = 0.06
	1995	66	1.4	4	1.2	
	1997	92	1.9	7	2.1	
	1999	99	2.1	7	2.1	
	2001	86	1.8	12	3.6	
	2002	44	0.9	3	0.9	
	2003	57	1.2	7	2.1	
	2004	67	1.4	5	1.5	
	2005	80	1.7	4	1.2	
	2006	85	1.8	7	2.1	
	2007	125	2.6	11	3.3	

Category	Category Value	Sampling Frame		Completed and Valid Responses		p-value
		N	%	N	%	
2008		168	3.5	16	4.8	
2009		146	3.1	16	4.8	
2010		153	3.2	15	4.5	
2011		186	3.9	14	4.2	
2012		160	3.3	18	5.4	
2013		195	4.1	14	4.2	
2014		210	4.4	14	4.2	
2015		246	5.1	15	4.5	
2016		265	5.5	8	2.4	
2017		255	5.3	12	3.6	
2018		283	5.9	21	6.3	
2019		309	6.5	14	4.2	
2020		284	5.9	9	2.7	
2021		339	7.1	26	7.8	
2022		358	7.5	27	8.1	
2023		374	7.8	19	5.7	
Total		4791	100.0	332	100.0	

in column totals are due to rounding but sum precisely to 100% at three decimal places.

Summary

Overview

This manuscript outlines the methodology used by the ABFM to refine content domain classifications and establish exam question distributions that accurately reflect the current scope of sports medicine practice nationwide. The survey achieved a 42.2% response rate, exceeding the typical practice analysis response rate among physicians (less than 30%), enhancing the robustness of the findings.⁶ A good response rate is necessary to reduce the risk of response bias.⁷

Importantly, respondents were demographically representative of the overall sampling frame across key variables, with the only statistically significant difference observed in certifying board distribution. This high level of representativeness minimizes concerns about nonresponse bias and supports the generalizability of the proposed content domain allocations. To ensure validity and accuracy in determining content domain proportions, the Rasch model was employed.² This methodology eliminates individual rater biases while integrating both the frequency with which clinical activities are performed and their potential risk of harm. By applying this empirically grounded approach, the final domain percentages reflect an objective, data-driven framework for exam content allocation.

Limitations

Three key limitations should be considered when interpreting the findings of this study. First, the Foundations of Care content domain lacks empirical validation for its assigned percentage, as it is primarily knowledge-based rather than grounded in observable clinical activities. Unlike other domains, which were weighted based on data-driven estimates of clinical activity frequency and risk of harm, the Foundations of Care domain could not be empirically assessed in the same manner. As a result, its allocation of 5% of the examination was a policy decision made by the SP MED Advisory Committee, balancing the inclusion of essential foundational topics with the broader objective of basing the exam structure on empirical data. Second, while the survey sample was generally representative across key demographic variables, participation rates varied by certifying board, likely due to differences in incentive structures. This discrepancy may have influenced response rates and was an inherent limitation of the study, as governance constraints prevent the ability to offer uniform incentives across all certifying boards. Despite this, the overall representativeness of the sample on other demographic variables supports the validity of the findings. The third limitation of the study is that it has yet to be externally validated in actual practice; however, it will be challenging due to the difficulty of controlling other confounding variables related to patient outcomes.

Future work

The practice of Sports Medicine is continuously evolving, particularly in times of transformative change. Advances in technology, such as artificial intelligence and telemedicine,

Table 3. Clinical Activities and Frequency Index.*

Clinical Activity/Survey Question	Frequency
Promote physical activity	0.606
Manage non pharmacologic pain strategies	0.586
Diagnose and manage knee joint disorders	0.583
Diagnose and manage musculotendinous disorders of the shoulder, including biceps, rotator cuff, pectoralis, and latissimus dorsi	0.577
Counsel on over-the-counter medications	0.571
Inject or aspirate a joint or soft tissue	0.564
Counsel on chronic disease prevention and health promotion	0.563
Diagnose and manage musculotendinous disorders of the knee	0.561
Diagnose and manage bursitis of the shoulder and scapula	0.557
Counsel on weight	0.554
Diagnose and manage glenohumeral joint disorders	0.552
Counsel on nutrition	0.548
Counsel on injury prevention	0.543
Diagnose and manage musculotendinous disorders of the leg, ankle, and foot	0.540
Diagnose and manage musculotendinous disorders of the pelvis, hip, and thigh	0.540
Diagnose and manage hip joint and sacroiliac joint disorders	0.538
Diagnose and manage knee instability and ligamentous injuries	0.533
Diagnose and manage ankle and foot joint disorders	0.531
Counsel on hydration	0.531
Perform an ultrasound-guided procedure	0.530
Diagnose and manage musculotendinous disorders of the elbow	0.529
Diagnose and manage bursitis of the pelvis and hip	0.529
Prescribe exercise in individuals with known comorbidities	0.528
Diagnose and manage leg, ankle, and foot instability and ligamentous injuries	0.527
Prescribe exercise in apparently healthy individuals	0.525
Diagnose and manage lumbar radiculopathy	0.523
Diagnose and manage shoulder instability and ligamentous injuries, including acromioclavicular, glenohumeral, and sternoclavicular joints	0.522
Diagnose and manage musculotendinous disorders of the hand and wrist	0.520
Diagnose and manage hand and wrist joint disorders	0.519
Evaluate an athlete's risk of injury	0.516
Prescribe pain medications	0.514
Diagnose and manage obesity	0.514
Counsel on activity guidelines	0.514
Diagnose and manage leg, ankle, and foot fractures and bone stress injuries	0.513
Apply a cast, splint, or brace	0.512
Diagnose and manage acute sports-related concussion	0.511
Diagnose radiographic musculoskeletal lesions	0.505
Diagnose and manage bursitis of the knee	0.504
Diagnose and manage cervical disc disorders	0.504
Perform and interpret a diagnostic ultrasound	0.502
Counsel on sports specific technique (including throwing, running, jumping, swimming mechanics)	0.501
Diagnose and manage cervical radiculopathy and myelopathy	0.499
Diagnose radiographic musculoskeletal anatomic variants	0.499

Diagnose and manage hand and wrist fractures and bone stress injuries	0.497
Diagnose and manage elbow joint disorders	0.494
Evaluate athlete for medical clearance for sport	0.494
Counsel on supplement use	0.494
Diagnose and manage cervical facet disorders	0.493
Diagnose and manage ganglion cyst	0.492
Diagnose and manage thoracolumbar disc disorders	0.492
Diagnose and treat respiratory infections	0.489
Diagnose and manage depression/anxiety	0.489
Diagnose and manage PEDIATRIC apophyseal/epiphyseal conditions	0.489
Diagnose and manage cervical spondylosis	0.487
Diagnose and manage neurovascular disorders of the hand and wrist	0.487
Counsel on coping with injury	0.487
Interpret family history as a component of the PPE	0.486
Counsel on sleep hygiene and diagnose and manage impaired sleep	0.486
Diagnose and manage thoracolumbar facet disorders	0.485
Diagnose and manage shoulder fractures and bone stress injuries	0.481
Diagnose and manage bursitis of the elbow	0.481
Diagnose and manage hand and wrist instability and ligamentous injuries	0.481
Administer Preparticipation Evaluation (PPE)	0.481
Screen Athlete for mental health disorders	0.480
Diagnose and manage elbow and forearm fractures and bone stress injuries	0.480
Diagnose and manage bursitis of the leg, ankle, and foot	0.480
Counsel on protective equipment	0.478
Diagnose and manage skin disease of fungal, bacterial, or viral etiology	0.478
Diagnose and manage delayed onset muscle soreness	0.476
Diagnose and manage exercise associated muscle cramps	0.475
Diagnose and manage fractures unique to PEDIATRICS	0.474
Evaluate ADULT athlete for sport and exercise participation	0.474
Diagnose and manage spondylolisthesis	0.474
Diagnose and manage knee fractures and bone stress injuries	0.473
Inject a nerve or nerve sheath	0.473
Diagnose and manage persistent postconcussion symptoms	0.473
Evaluate PEDIATRIC athlete for sport and exercise participation	0.473
Counsel on early sport specialization	0.472
Treat lacerations/abrasions	0.471
Counsel athletes on head injury and chronic traumatic encephalopathy	0.470
Diagnose and manage neurovascular disorders of the upper arm and shoulder	0.469
Diagnose and manage cervical spinal stenosis	0.468
Diagnose and manage rib and chest wall disorders	0.468
Diagnose, investigate and manage hypertension, including secondary causes of hypertension	0.467
Diagnose and manage pelvis, hip, and thigh fractures and bone stress injuries	0.467
Counsel on and administer immunizations	0.467
Diagnose and manage elbow instability and ligamentous injuries	0.466
Diagnose and manage neurovascular disorders of the elbow and forearm	0.466
Diagnose and manage contact dermatitis	0.465

Diagnose and manage low bone density (osteoporosis/osteopenia)	0.464
Diagnose and manage overtraining/overreaching	0.463
Counsel on skin cancer prevention	0.462
Diagnose and manage diabetes mellitus	0.461
Diagnose and manage asthma and exercise-induced bronchospasm	0.461
Diagnose and manage thoracolumbar spinal stenosis	0.460
Interpret cardiovascular screening tests	0.460
Diagnose and manage crystalline arthropathies	0.459
Diagnose and manage headache in athlete	0.457
Diagnose and manage neurovascular disorders of the leg, ankle, and foot	0.457
Diagnose and manage anemia	0.457
Interpret synovial fluid analysis	0.456
Evaluate exercise associated cardiopulmonary symptoms chest pain, palpitations, dizziness, or dyspnea with exercise	0.456
Diagnose and manage fibromyalgia and chronic pain syndromes	0.455
Manage return-to-play decisions for febrile illness in athletes	0.451
Evaluate athlete with chronic medical conditions for sport and exercise participation	0.451
Diagnose and manage inflammatory arthritis, including rheumatoid arthritis, lupus arthropathy, spondyloarthropathies, reactive arthritis, Lyme arthritis, juvenile idiopathic arthritis	0.451
Diagnose and manage neurovascular disorders of the pelvis, hip, and thigh	0.449
Counsel on, diagnose, and manage genitourinary infections, including sexually transmitted infections	0.447
Diagnose and manage thyroid disorders	0.445
Support performance goals, and diagnose and manage performance anxiety	0.445
Prevent, diagnose, and treat burnout	0.445
Diagnose and manage osteochondritis dissecans	0.444
Diagnose and manage gastrointestinal disorders in athletes	0.444
Counsel on travelers' health for athletes	0.443
Diagnose and manage scoliosis	0.443
Diagnose and manage abdominal wall disorders	0.442
Diagnose and manage skin, nail, and nailbed emergencies	0.438
Refer for neuropsychological testing	0.437
Diagnose and manage thoracic outlet syndrome	0.436
Diagnose and manage PEDIATRIC spine conditions	0.436
Diagnose and manage chronic sequela of concussion	0.435
Evaluate Masters athlete for sport and exercise participation	0.434
Diagnose and manage relative energy deficiency in sport (REDs/Triad) in ADULT patients	0.433
Reduce a joint dislocation or fractures	0.432
Diagnose and manage venous thrombosis	0.432
Counsel on, diagnose, and manage heat injury and disorders	0.431
Refer for treadmill or bike exercise stress test	0.431
Diagnose and manage urticaria	0.430
Manage return-to-play decisions with infectious gastroenteritis	0.430
Diagnose and manage acute mental health emergencies	0.430
Diagnose and manage mononucleosis	0.430
Diagnose and manage neurovascular disorders of the knee	0.429
Diagnose and manage acute nasal trauma, including epistaxis	0.429
Diagnose and manage complex regional pain syndrome	0.427

Diagnose and manage arteriosclerotic coronary artery disease	0.427
Manage contraception	0.427
Diagnose and manage eating disorders/disordered eating	0.427
Diagnose and manage peripheral vascular disease	0.426
Diagnose and manage osteoporotic vertebral compression fractures	0.425
Diagnose and manage brachial plexopathies	0.425
Diagnose and manage nonemergent facial trauma	0.423
Engage in shared decision-making on medical retirement from sport due to concussion	0.420
Diagnose and treat menstrual disorders in athletes	0.419
Diagnose and prevent myositis ossificans	0.417
Diagnose and manage acute cervical spine traumas	0.416
Counsel on and prevent transmission of bloodborne pathogens	0.416
Diagnose structural lung disease and non-asthma airway disease, including cystic fibrosis and COPD	0.415
Evaluate abnormal urinary sediment, including hematuria, hemoglobinuria, myoglobinuria, proteinuria	0.415
Diagnose and manage heterotopic ossification	0.414
Diagnose and manage pelvic floor dysfunction	0.413
Manage intravenous fluids	0.413
Refer for cardiopulmonary exercise testing	0.413
Diagnose and manage relative energy deficiency in sport (REDs/Triad) in PEDIATRIC patients	0.411
Diagnose neuropraxia/neurotmesis	0.410
Diagnose and manage acute abdominal/pelvic/genitourinary trauma/disorders	0.409
Diagnose and manage acute facial trauma	0.408
Diagnose and manage thoracolumbar fractures, excluding vertebral compression fractures	0.406
Diagnose and refer sepsis, septic joint, closed space infections, osteomyelitis, and necrotizing fasciitis	0.406
Diagnose and manage cardiac arrhythmia	0.406
Diagnose and manage polymyalgia rheumatica, dermatomyositis, polymyositis, and other inflammatory myopathies	0.406
Diagnose and manage exertional rhabdomyolysis	0.405
Diagnose and manage acute metabolic derangements, including exercise associated hyponatremia, diabetic ketoacidosis, hypoglycemia	0.405
Diagnose and evaluate structural heart disease	0.405
Diagnose and counsel on sickle cell disease and sickle cell trait	0.401
Counsel on and manage retirement from sport	0.400
Counsel on and prevent doping	0.397
Diagnose and manage acute lumbar spinal cord injuries	0.396
Diagnose and evaluate valvular heart disease and aortopathies	0.396
Evaluate and treat a collapsed athlete	0.395
Diagnose and refer acute ocular trauma and disorders	0.394
Diagnose and refer dental trauma	0.393
Diagnose and manage exercise induced laryngeal obstruction (vocal cord dysfunction) and laryngospasm	0.389
Diagnose and manage acute auricular trauma	0.389
Diagnose and manage acute chest trauma and disorders	0.386
Diagnose and manage shoulder disorders in wheelchair ambulators	0.385
Diagnose and refer nonaccidental trauma	0.382
Diagnose and manage vision loss or eye pain	0.381
Diagnose and evaluate electrical heart disease and ion channelopathies	0.381
Manage and counsel on pregnancy, peripartum, and postpartum athletes	0.381
Interpret electrodiagnostic (NCS/EMG) testing	0.379

Evaluate athlete with cancer or cancer survivor for sport and exercise participation	0.379
Diagnose and manage pulmonary embolism	0.376
Counsel on, diagnose, and manage cold injury and disorders	0.373
Diagnose and manage stable cervical fractures	0.373
Diagnose and manage sternoclavicular fractures and dislocations	0.372
Diagnose and manage osteonecrosis in PEDIATRIC athletes	0.371
Diagnose and manage acute lumbar spine emergencies	0.369
Manage lower extremity limb deficiency	0.367
Diagnose and manage anaphylaxis	0.363
Evaluate seizure disorder	0.363
Diagnose and manage upper extremity limb deficiency	0.361
Diagnose and treat acute seizure	0.358
Perform compartment pressure testing	0.358
Evaluate genitourinary injury, including pudendal nerve and straddle injuries	0.356
Perform preparticipation evaluation for athlete with disability/parasport	0.356
Manage posttraumatic brain injury, excluding concussion	0.356
Diagnose and counsel on coagulopathies (bleeding disorders), including hemophilia	0.355
Evaluate and treat an open fracture	0.354
Counsel on, diagnose, and manage altitude injury and disorders	0.354
Diagnose and refer intracranial hemorrhage and acute cerebrovascular accident	0.352
Diagnose and manage autonomic dysreflexia	0.348
Diagnose and manage breast contusion	0.347
Diagnose and treat acute and chronic overdose	0.338
Diagnose and manage an acute knee dislocation	0.337
Diagnose and refer acute compartment syndrome	0.337
Perform extracorporeal shockwave therapy	0.336
Diagnose and manage acute thoracic spine emergencies	0.334
Diagnose and refer blunt and penetrating neck trauma	0.333
Evaluate central nervous system disorders in athletes, including multiple sclerosis, cerebral palsy, post tumor	0.325
Diagnose, manage, and prevent dermatologic conditions in parasport athletes	0.323
Perform a fluoroscopic-guided procedure	0.319
Diagnose and manage acute cervical spinal cord emergencies	0.317
Perform preparticipation evaluation for transgender athlete	0.308
Diagnose and manage skull fractures	0.301
Manage post spinal cord injury	0.301
Diagnose and manage cardiac arrest	0.300
Diagnose and manage exercise associated collapse associated with sickle cell trait (ECAST) and sickle cell disease	0.292
Diagnose and treat traumatic arthrotomy	0.288
Manage athlete post cerebrovascular accident	0.288
Manage compromised airway	0.286
Diagnose neuromuscular disorders (eg amyotrophic lateral sclerosis (ALS), myasthenia gravis, etc)	0.286
Diagnose and treat acute hemorrhagic vascular injuries	0.285
Diagnose and manage central nervous system infections	0.274
Diagnose and treat an acute hip dislocation	0.272
Diagnose and manage atlantoaxial instability	0.272
Counsel on, diagnose, and manage undersea injury and disorders	0.261

Evaluate and manage genitourinary conditions post spinal cord injury	0.261
Evaluate and treat a traumatic amputation	0.258
Triage a mass casualty event	0.252
Counsel on, diagnose, and manage lightning injuries	0.233
Diagnose and refer fat embolism	0.081

* Rasch modeling used here derives the relative importance of each clinical activity based on frequency. This does not estimate the absolute frequency of the clinical activity.

Table 4. Blueprint Domain Percentages Based on 4 Different Weighting Schemas.

Content Domain	Clinical Activities ¹ # (%)	FI	IoH	FI + IoH	Propose Approval Version
Care of Emergency Conditions	46 (19.9%)	15.1%	29.6%	22.4%	23%
Preventive Aspects of Sports Medicine	27 (11.7%)	12.4%	8.3%	10.4%	10%
Musculoskeletal Conditions	81 (35.1%)	36.4%	27.8%	32.1%	32%
Medical Conditions	77 (33.3%)	31.1%	29.3%	30.2%	30%
Foundations of Practice ²	--	5.0%	5.0%	5.0%	5%
Total	231 (100%)	100%	100%	100% ³	100%

¹ The Clinical Activities column indicates the number of clinical activities assigned to each content domain and the percentage of the exam each domain would represent if based solely on activity count, without adjustments for frequency of occurrence (FI) or risk of patient harm (IoH). The Foundations of Practice domain is excluded from this calculation.

² Foundations of Practice domain was fixed at 5% by policy, as it does not involve observable clinical activities. The empirically derived percentages from survey data, reflecting observable clinical activities, were proportionally adjusted to collectively occupy the remaining 95% of the examination.

³ Percentages in this column may not sum exactly to 100% due to rounding; however, they total precisely 100% when calculated to three decimal places.

are likely to shape the field by enhancing diagnostic capabilities, expanding access to care, and streamlining clinical workflows. Additionally, policy changes, including regulations governing telemedicine, modifications to medical reimbursement policies, and evolving restrictions on scope of practice, will further influence the delivery of care. As a result, practice analysis activities must be responsive to these ongoing developments to ensure that assessments and certification standards remain aligned with the evolving landscape of Sports Medicine.

Funding

The research was funded by the American Board of Family Medicine. The cosponsoring boards of the Certificate of Added Qualification Sports Medicine including the American Board of Pediatrics, the American Board of Emergency Medicine and the American Board of Physical Medicine and Rehabilitation participated in the research and provided in-kind support. The American Board of Internal Medicine, a qualify board, provided in-kind support.

Conflicts of Interest

The authors report no conflicts of interest.

Acknowledgements

The authors would like to acknowledge the staff of the American Board of Family Medicine, members of the cosponsoring boards, members of the sports medicine advisory committee and members of the sports medicine assessment committee for their time in creating the blueprint, assisting with research, administering the survey or reviewing the manuscript. This information is also included to disclose the participants in the blueprint process.

ABFM Staff: Kevin Rode, Amanda Dawahare, Mirelle Hughes, Hannah Gregory, Tate Downey, Sravanthi Nallandula, Eric Ding

Co-Sponsoring Boards: Michael Barone, Carolyn Kinney, Melissa Barton

Assessment Committee: Chad Asplund, Joel Brenner, Erin Hammer, Joseph Ihm, Elena Jelsing, Michelle Labotz, Amy Powell, Brett Toresdahl, Karin Van Baak, Anna Waterbrook, Irfan Asif, Nailah Adams Morancie, Alicia Tucker, Dale Colorado, Bradley Changstrom

Advisory Committee: Ronnie Barnes, David Berkoff, Anthony Beutler, Katherine Dolbec, Kristine Karlson, William Micheo, Mark Stovak, Christopher Visco, Andrew Perron, James C Puffer, James Kinderknecht, Suzanne Hecht, Holly Benjamin, Warren Newton, Bradley Changstrom

Corresponding Author

Bradley G. Changstrom, MD, The American Board of Family Medicine, Lexington, KY, University of Colorado School of Medicine, bradley.changstrom@cuanschutz.edu

This article was externally peer reviewed.

Submitted: July 30, 2025 EDT. Accepted: September 15, 2025 EDT.

References

1. Likert R. A technique for the measurement of attitudes. *Archives of Psychology*. 1932;22:5-55.
2. Andrich D. A rating formulation for ordered response categories. *Psychometrika*. 1978;43:561-573. doi:[10.1007/BF02293814](https://doi.org/10.1007/BF02293814)
3. O'Neill TR, Stelter K, Newton W. Developing Content Domain Weights for the 2025 Family Medicine Certification Scale. *J Am Board Fam Med*. 2025;38(2):330-344. doi:[10.3122/jabfm.2024.240282R1](https://doi.org/10.3122/jabfm.2024.240282R1)
4. Peabody MR, O'Neill TR, Stelter KL, Puffer JC. Frequency and Criticality of Diagnoses in Family Medicine Practices: From the National Ambulatory Medical Care Survey (NAMCS). *J Am Board Fam Med*. 2018;31(1):126-138. doi:[10.3122/jabfm.2018.01.170209](https://doi.org/10.3122/jabfm.2018.01.170209)
5. Stelter KL, O'Neill TR, Newton WP. Developing the New Family Medicine Certification Scale Blueprint Framework. *Journal of the American Board of Family Medicine*. Published online 2025. doi:[10.3122/jabfm.2024.240464R1](https://doi.org/10.3122/jabfm.2024.240464R1)
6. Barnhart BJ, Reddy SG, Arnold GK. Remind Me Again: Physician Response to Web Surveys: The Effect of Email Reminders Across 11 Opinion Survey Efforts at the American Board of Internal Medicine from 2017 to 2019. *Eval Health Prof*. 2021;44(3):245-259. doi:[10.1177/01632787211019445](https://doi.org/10.1177/01632787211019445)
7. Hendrix N, Maisel N, Everson J, et al. Impact of response bias in three surveys on primary care providers' experiences with electronic health records. *J Am Med Inform Assoc*. 2024;31(8):1754-1762. doi:[10.1093/jamia/ocae148](https://doi.org/10.1093/jamia/ocae148)