

Original Research

The Recognition, Utilization Rates, Barriers, and Application Accuracy of the Hamstring Strain Clinical Practice Guidelines

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Background and Purpose

Clinical practice guidelines (CPGs) are systematically developed statements designed to promote evidence-based practice, assist in decision-making, and reduce unwarranted deviations in practice. The purpose of this study was to describe the awareness and attitudes of physical therapists (PTs) towards using the Hamstring Strain Injury in Athletes (HSIA) CPG and determine the relationship between barriers, utility, and knowledge of practice guidelines with the behavioral characteristics and clinical care patterns of PTs.

Study Design

Explorative survey

Methods

Members of the American Academy of Sports Physical Therapy (AASPT) were surveyed regarding their perceived value and application of the HSIA CPG. Descriptive measures of central tendencies and nonparametric analysis were used to describe the data and identify differences. A forward stepwise regression was used to identify variables to explain if the level of CPG awareness and frequency of use were related to selected attitudes, beliefs, and barriers to utilization of the CPG.

Results

Eighty-seven percent of respondents were aware of the CPG resource. Fifty-six percent had read, reviewed, and/or integrated the recommendations into clinical practice. The respondents had a substantial positive opinion regarding its necessity, assistance in decision-making, ease of implementation, ability to improve outcomes, and reduction of unwarranted practice variation. Only 15% of respondents believed the CPG did not provide adequate evidence to adopt its recommendations. Barriers to utilization were the CPG's ability to account for provider expertise and its shortcomings in universally applying its findings to all patients' needs and expectations. Given a specific hamstring injury vignette, respondents accurately chose evidence-based examination, intervention, and injury prevention strategies in the vast majority of cases.

Conclusion

The HSIA CPG is a valuable resource for PTs in managing athletic injuries. The guideline clearly describes the aims, objectives, population, and evidence that contributes to each recommendation and is being used to improve rehabilitative care.

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Level of Evidence

3b

INTRODUCTION

Non-contact, strain injury to the hamstring musculature is a common neuromuscular pathology that disables athletes of all activity levels.¹ Injury can manifest as acute muscle strains or ruptures to chronic tendinopathies, though acute strains are most common.¹ The typical mechanism of injury includes sprinting, jumping, kicking, and/or any explosive plyometric movement.^{2,3} Hamstring injuries result in a significant loss of athlete practice and competition time, and compounding this fact is that hamstring injuries are likely to reoccur. The incidence of reoccurrence ranges from 12-34%,³ and this has been shown to happen within the first two weeks of return to sport.¹ Thus, the goal of rehabilitation should be to return athletes safely to their prior level of sport while minimizing the risk of re-injury.

Clinical practice guidelines (CPGs) are available to physical therapists (PTs) to utilize as part of their clinical decision-making, including the CPG for “Hamstring Strain Injury in Athletes” (HSIA).² CPGs are based on a systematic review of the evidence and published by the American Physical Therapy Association (APTA) and their academies including the American Academy of Sports Physical Therapists (AASPT). These documents are promoted to bridge the research-to-practice gap and facilitate evidence-based practice in an easily digestible format for busy clinicians. CPGs aim to assist in clinical decision-making, reduce unwarranted practice variation, and improve the value of physical therapy services rendered.^{4,5} They are not, however, intended to replace patient-centered judgments about best therapeutic management. What is less understood about CPGs is the degree to which clinicians are aware of these publications, the details of their recommendations, and whether or not they are implemented into clinical practice.

Previous literature suggests that PTs have a favorable attitude toward using evidence-based practice that is relevant to CPGs.⁶⁻⁹ Between 83-90% of PTs recognize the need and value of EBP⁵⁻⁷ and up to 96% consider guidelines important.⁷ Additionally, 79% feel that EBP plays a role in improving patient care quality and 72% feel that it helps their clinical decision making.⁶ While CPGs are one method of implementing EBP into clinical practice, attitudes, and beliefs may not necessarily coincide with implementation practices.

Implementation rates for CPGs as low as 29% have been reported.⁵ Potential barriers to use include lack of access, lack of support from colleagues, too much ‘recipe’, too few guidelines existing, insufficient time, lack of generalizability of findings to individual patients, and lack of interest.^{6,7} Behavioral characteristics (i.e., reading habits) of clinicians may also play a role. Additionally, clinicians may favor specific CPGs due to the patient population and the perceived strength of certain CPGs over others. For example, studies across disciplines have demonstrated that the Acute Low Back Problems in Adults guidelines are not heavily imple-

mented,¹⁰ while approximately half of the clinicians treating concussion reported implementing the CPG for evaluating concussion,¹¹ and overall adherence to low back pain guidelines are 67.2%.¹²

If physical therapy CPGs, such as the HSIA CPG, are useful in facilitating evidence-based practice, it seems important to understand clinician attitudes, beliefs, and implementation practices to address barriers that may exist and ultimately increase the use of the CPG to reduce unwarranted practice variation and improve the value of physical therapy services. Therefore, the purpose of this survey study was to describe the awareness and attitudes of PTs towards using the HSIA CPG, and to determine the relationship between barriers, utility, and knowledge of practice guidelines with the behavioral characteristics and clinical care patterns of PTs.

METHODS

This cross-sectional, exploratory study captured survey data from a convenience sample. In November 2023, all members of the AASPT were invited via email distribution and newsletter promotion to participate. Repeat requests were made at bimonthly intervals until the response rate did not generate at least a 10% increase in online survey participation. Respondent participation was voluntary, and no incentives were offered to influence the response rate.

The online, open survey was designed to collect information regarding the awareness and attitudes of PTs toward using the HSIA CPG from a representative population of sports PTs in the United States. The anonymous survey also collected demographic factors that were likely to influence the findings based on prior literature.⁶⁻¹⁰ No respondent name or identification was collected, and unique survey number identifiers were only available to the primary investigator. Data were stored on a secure, password-protected cloud drive and deleted from Qualtrics when the survey period ended. The survey’s design and administration are consistent with the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). Before dissemination of the survey, the study was reviewed and determined to meet exempt criteria by the Tufts University Social, Behavioral, and Educational Institutional Review Board. Boston, MA.

SURVEY ADMINISTRATION

Study data were collected and managed using Qualtrics XM electronic data capture tools. The data for this study were generated using Qualtrics software, Version 10/2022 of Qualtrics. (Copyright © 2020 Qualtrics.)

The invitation cover letter described the study’s purpose, emphasized anonymity through aggregate-only reporting, and stated that voluntary consent was implied by responding to the survey link. The instructions reminded respondents that there were no correct or preferred opinions or responses, and the examiners of the survey would investi-

gate the relationship between knowledge, utility, and barriers of the practice guidelines with behavioral characteristics of PTs such as sex, background/experience, location and setting, and credentials. Adaptive questioning was utilized for conditional responses and respondents were not required to answer queries they determined to be potentially sensitive. After the initial email was extended, follow-up requests were sent at two and four weeks. The survey informed potential respondents of the estimated time investment of the survey (15 minutes), the collected data security, and the intent of the study.

TOOL DEVELOPMENT

The survey tool was developed by a PT with over 40 years of academic and sports physical therapy clinical experience. Previous studies with similar objectives were also used as a reference to organize the survey content and format.⁵⁻⁷ The initial survey draft was piloted with four faculty colleagues familiar with CPGs and the treatment of hamstring strain injuries. Their critique regarding the survey's questions, organization, and readability enhanced the face validity of the content. Based on this collective input, the survey was modified and finalized for distribution. The final data collection instrument was a 39-item questionnaire containing 11 demographic questions, followed by three questions on guideline awareness, five questions on attitudes toward practice guidelines, four on guideline utilization, nine on barriers to guideline utilization, five regarding guideline recommendation recognition, and two application vignettes.

DATA ANALYSIS

Measures of central tendencies were derived using Microsoft Excel to describe the demographic profiles and opinion frequency of the respondents. Statistical inference tests were used on the two dependent variables to detect if there were demographic differences based on the level of CPG awareness and perceived level of barriers to CPG utilization to the frequency of its use. For continuous variables, given the non-normality of data (Kolmogorov-Smirnov test) a non-parametric test, the Mann-Whitney Rank sum tests were used. For categorical variables, chi-square tests were used. A post-hoc test (Bonferroni correction) was performed on every pairwise comparison to account for multiple hypothesis testing. A forward stepwise regression was used to identify variables to explain if the level of CPG awareness and frequency of use was related to selected attitudes, beliefs, and barriers to utilization with the CPG. Analyses were performed using SigmaPlot 14.5.

Based on approximately 7000 AASPT members, at least 88 respondents (1.25% response rate from invited group members) were needed to analyze the continuous variables and categorical variables to bring the statistical random sampling margin of error within $\pm 10\%$ with a 95% confidence interval. The sample size estimate was based on the number of independent variables analyzed and an acceptable survey margin of error calculation.

RESULTS

One hundred fifty-two individuals responded to the survey resulting in 106 complete data sets for analysis. Sixty-eight percent of the respondents were male with a mean experience of 18.1 ± 13.4 years. Fifty-nine percent of the respondents had a doctoral degree, 47% had a residency or fellowship training background, and 87% had some type of post-graduate credential or certification. Over 60% of respondents worked in an outpatient clinic setting and 5.9% of their clinical care time was devoted to hamstring injury management. [Table 1](#) provides additional demographic details.

Eighty-seven percent of the respondents were at least aware of the CPG resource and 90% knew exactly where and how to quickly access the document. Fifty-six percent had read, reviewed, and/or integrated the recommendations into their clinical practice. ([Table 2](#))

Three demographic variables had a significant difference in the level of CPG awareness, defined as those respondents who had read, reviewed, and/or integrated the CPG into routine practice. Higher levels of experience, higher terminal degree status, and increased patient care volume were present in those who were more familiar with the CPG content ($p = 0.045$, $p = 0.048$, and $p < 0.0001$, respectively). Variables that were not significantly different were respondent sex, residency/fellowship background, percentage of time devoted to hamstring injury care, and monthly volume of professional reading.

[Table 3](#) provides insight into the attitudes and perspectives towards the value of the CPG. There was substantial agreement regarding its necessity for practice (67% agreement), assistance in decision-making (88% agreement), ease of implementation (67% agreement), benefit to improved outcomes (78% agreement), and reduction of unwarranted practice variation (72% agreement). [Table 4](#) provides additional insight into the ability to utilize the CPG. Seventy-four percent of the respondents use the CPG frequently to always, 93% are confident in interpreting its recommendations, and 88% have the necessary resources, equipment, and space to implement the CPG recommendations. Only 15% of respondents believe the CPG did not have adequate evidence and insight to adopt the recommendations.

[Figure 1](#) and [Table 5](#) describe the perceptions of potential barriers to using the recommendations of the CPG. Barriers, where respondents were somewhat neutral and/or split on their perspective, included the CPG's ability to value the importance of considering patient's desires and expectations, the provider's expertise and autonomy, and whether the CPG is too prescriptive and does not address a patient's unique needs. In all instances, the median response was "neither agree nor disagree". Barriers that do not appear to be impediments include lack of utilization support from employers or colleagues and inadequate interest in or time to read the content. Only 12% of respondents reported the CPG was difficult to read or appraise.

Two significant barriers to CPG utilization explained 24% of the variance in the frequency of HSIA CPG use. Re-

Table 1. Survey Respondent Characteristics (n = 106)

CHARACTERISTIC	FINDING
Sex	68 men (64%); 38 women (36%)
Professional Years' Experience (mean $\pm$ SD)	18.1 $\pm$ 13.4; Median = 16.5
Geographical Location	Northeast - 20 (19%) Midwest - 24 (23%) South - 32 (30%) West - 30 (28%)
Highest Education Degree	Doctoral - 63 (59%) Master's - 23 (21%) Baccalaureate - 20 (19%) Certificate - 1 (1%)
Certifications/Credentials	Sports Clinical Specialist - 41 (39%)
	Certified Strength and Conditioning Coach - 38 (36%)
	Certified/Licensed Athletic Trainer - 31 (29%)
	Manual Therapy Certification - 21 (20%)
Residency-Fellowship Experience	No- 56 (53%) Yes - 50 (47%)
AASPT Special Interest Group Membership	College & Pro Sports - 29 Knee - 19 Shoulder - 19 Performance Enhancement - 17 Running - 14 Hip - 13 Female Athlete - 11 Tactical Athlete - 9 Youth Athlete - 8 Specialization - 6 Golf Performance - 6 Sports Concussion - 5 Adaptive Sports - 3
Practice Setting	Private Outpatient office or practice group - 40 (38%) Health System or Hospital-based Outpatient facility or clinic - 25 (24%) Athletic Organization (high school, collegiate, professional, Olympic) - 16 (15%) Academic Institution (post-secondary) - 15 (14%) Fitness, Health, or Wellness facility - (4%) Research Center - 1 Other - 5
Hours/Week Clinical Care mean $\pm$ SD (range)	31.3 hours $\pm$ 15.7 (0-50)
% Of care devoted to Hamstring Injury Mean $\pm$ SD (range)	5.9% $\pm$ 7.0 (0-50)
Number of scientific articles read/month Mean $\pm$ SD (range)	7.5 $\pm$ 11.7 (0-100)

AASPT – American Academy of Sports Physical Therapy

Table 2. CPG Awareness and Access

QUESTION	FINDING
Level of Hamstring CPG Awareness	Not aware - 14 (13%) Aware - 33 (31%) Read and reviewed - 29 (28%) Integrated recommendations into practice - 29 (28%)
Introduced to Hamstring CPG during physical therapy training?	Yes - 55 (52%) No - 47 (44%) Unsure - 4 (4%)
Know exactly where to quickly access the Hamstring CPG?	Yes - 90 (86%) No - 15 (14%)

CPG – Clinical Practice Guideline

Table 3. CPG Attitudes/Perspectives

STATEMENT	FINDING
CPG is necessary to practice	Strongly Agree: 26 (25%) Somewhat Agree: 44 (42%) Neither Agree nor Disagree: 23 (22%) Somewhat Disagree: 7 (7%) Strongly Disagree: 5 (5%)
CPG assists in clinical decision-making	Strongly Agree: 38 (47%) Somewhat Agree: 45 (41%) Neither Agree nor Disagree: 18 (11%) Somewhat Disagree: 2 (1%) Strongly Disagree: 1 (0%)
CPG is easy to implement and utilize	Strongly Agree: 26 (25%) Somewhat Agree: 44 (42%) Neither Agree nor Disagree: 23 (22%) Somewhat Disagree: 7 (7%) Strongly Disagree: 5 (5%)
CPG will improve outcomes and minimize harm	Strongly Agree: 34 (32%) Somewhat Agree: 48 (46%) Neither Agree nor Disagree: 20 (19%) Somewhat Disagree: 3 (3%) Strongly Disagree: 0 (0%)
CPG will standardize care and reduce unwarranted practice variation	Strongly Agree: 33 (31%) Somewhat Agree: 43 (41%) Neither Agree nor Disagree: 18 (17%) Somewhat Disagree: 10 (10%) Strongly Disagree: 1 (1%)

CPG – Clinical Practice Guideline

Table 4. Hamstring CPG Utilization

IMPLEMENTATION	FINDING
CPG Frequency of use	Always: 16 (15%) Frequently: 63 (59%) Occasionally: 22 (21%) Rarely: 4 (4%) Never: 1 (1%)
Confident in interpreting CPG recommendations	Strongly Agree: 62 (59%) Somewhat Agree: 36 (34%) Neither Agree nor Disagree: 7 (7%) Somewhat Disagree: 0 (0%) Strongly Disagree: 0 (0%)
Have the necessary resources, equipment, and space to implement CPG recommendations	Strongly Agree: 47 (45%) Somewhat Agree: 45 (43%) Neither Agree nor Disagree: 12 (11%) Somewhat Disagree: 1 (1%) Strongly Disagree: 0 (0%)
CPG lacks adequate evidence and insight to adopt recommendations	Strongly Agree: 6 (6%) Somewhat Agree: 10 (9%) Neither Agree nor Disagree: 28 (27%) Somewhat Disagree: 37 (35%) Strongly Disagree: 24 (23%)

CPG – Clinical Practice Guideline

spondents who felt the CPG devalued provider autonomy had a correlation coefficient of 0.40 with a coefficient of determination of 0.16. Adding the level of responder interest in the CPG content increased the variance to 0.23. Barriers to utilization such as underemphasis on patient value and expectation, underemphasis on provider expertise, difficulty in interpreting and appraising the CPG, CPG being too prescriptive, inadequate time or access to the CPG, and

lack of colleague or employer encouragement levels were not significantly correlated to the frequency of use and did not meaningfully contribute to the regression model.

[Table 6](#) explored the respondents' application and adherence to the practice guidelines that are considered conclusive or acceptable. Using A (strong, conclusive evidence) or B (moderate, acceptable evidence) grade-level recommendations as the foundation of a correct response, the re-

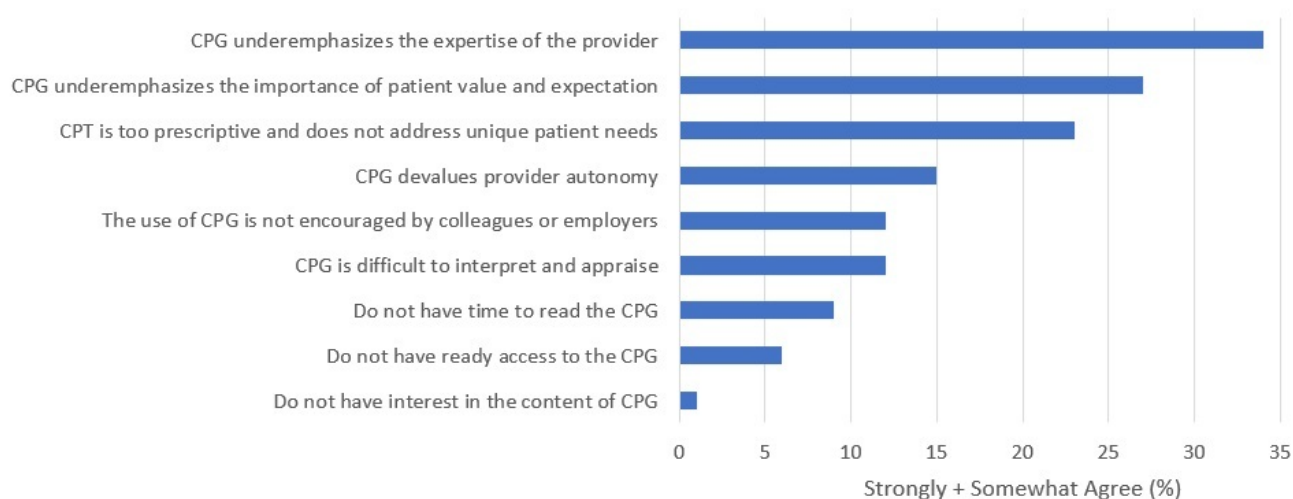


Figure 1. Hierarchy of Barriers to CPG Implementation Based on Responder Agreement

spondents answered correctly on four of the five examination-related recommendations with this level of evidence. The utilization of previous injury as a risk factor, objective quantification of force production with a dynamometer, prescribing Nordic hamstring curl training as a preventative intervention, and not using therapeutic modalities to control pain and swelling in the early healing phases were correctly identified 99%, 90%, 82%, and 66% of the time, respectively. Assessment of trunk and pelvic posture during the functional movement examination was identified 69% of the time as appropriate despite only expert opinion (Level F) evidence.

Tables 7 and 8 describe the respondent's application of specific examination and treatment approaches in response to a vignette describing an acute, Grade II hamstring strain injury in a collegiate soccer athlete. Using recommendations at level A or B grade levels as the criteria for a correct response we found that the majority of respondents routinely practice in a manner consistent with the guideline. Regarding the available examination strategies provided, most respondents had perspectives that matched guideline recommendations in all instances except for the standard assessment of lumbar, hip, and/or knee ROM. Sixty-five percent of respondents routinely make this assessment in the absence of a high level of evidence of its efficacy. Of the available intervention choices, only static stretching was not identified for its higher level of recommendation. Seventy-seven percent of respondents did not elect to use static stretching in the vignette. A much higher percentage of respondents did recognize the higher-grade recommendation for dynamic stretching (62%). The use of soft tissue mobilization techniques was correctly identified by 58% of respondents as still being a gap in our knowledge as to its level of effectiveness.

DISCUSSION

The current study results indicate that the CPG for HSIA is a favorably regarded and valuable guideline to assist practi-

tioners in their evaluative and management decision-making. Respondents indicated that the guideline recommendations were easy to adopt, contributed to improved outcomes, and decreased unwarranted practice variation. Respondents were cognizant that the guideline is somewhat limited in its ability to recognize the specific needs, desires, and expectations of an athlete and the influence it brings to the decision-making process in light of the provider's expertise and experience. This finding seems to support the sophistication and understanding of the respondents that the guideline simply provides recommendations based on a thorough vetting of the literature, but clinical management relies on this information to be filtered and customized through the lens of the provider and goals of the athlete.

The only significant barrier to HSIA CPG utilization identified in this study for those respondents with interest in the content was the acknowledgment that the guideline does not account for the experience and expertise of the provider. This mild reluctance for utilization may have been magnified by a respondent sample that was a very experienced, well-read, and highly trained cohort with the majority of providers possessing advanced certifications and credentials. Respondents seem to understand that the evidence from the literature is only part of the evidence-based practice process given their slight unease about its implementation without considering the experience of the provider and the athlete's unique circumstance and management expectations. This attitude is consistent with the intent of APTA-sponsored CPGs in which guidelines are provided to assist in clinical decision-making rather than to supplant the place of clinical judgment.

The current study captured data from a highly qualified group of PTs, which may explain the lack of perceived barriers seen in previous studies.^{5,8,9,13-15} The expertise of these survey participants is reflected in the high self-reported confidence in interpreting the findings of the CPG. This confidence could also be attributed to guideline recommendations that are well-organized with a grading scale that is easily understood and recognizable.

Table 5. Barrier to CPG Implementation

POTENTIAL BARRIER	FINDING
CPG underemphasizes the importance of patient value and expectation	Strongly Agree: 6 (6%) Somewhat Agree: 22 (21%) Neither Agree nor Disagree: 56 (54%) Somewhat Disagree: 14 (13%) Strongly Disagree: 6 (6%)
CPG underemphasizes the expertise of the provider	Strongly Agree: 6 (6%) Somewhat Agree: 29 (28%) Neither Agree nor Disagree: 42 (40%) Somewhat Disagree: 22 (21%) Strongly Disagree: 5 (5%)
CPG devalues provider autonomy	Strongly Agree: 2 (2%) Somewhat Agree: 14 (13%) Neither Agree nor Disagree: 35 (34%) Somewhat Disagree: 33 (32%) Strongly Disagree: 20 (19%)
CPG is difficult to interpret and appraise	Strongly Agree: 4 (4%) Somewhat Agree: 8 (8%) Neither Agree nor Disagree: 28 (27%) Somewhat Disagree: 44 (42%) Strongly Disagree: 20 (19%)
CPG is too prescriptive and does not address unique patient needs	Strongly Agree: 1 (1%) Somewhat Agree: 23 (22%) Neither Agree nor Disagree: 32 (31%) Somewhat Disagree: 35 (34%) Strongly Disagree: 13 (12%)
Do not have time to read the CPG	Strongly Agree: 2 (2%) Somewhat Agree: 7 (7%) Neither Agree nor Disagree: 14 (13%) Somewhat Disagree: 32 (31%) Strongly Disagree: 49 (47%)
Do not have ready access to the CPG	Strongly Agree: 2 (2%) Somewhat Agree: 4 (4%) Neither Agree nor Disagree: 6 (6%) Somewhat Disagree: 21 (20%) Strongly Disagree: 71 (68%)
Do not have interest in the content of CPG	Strongly Agree: 0 (0%) Somewhat Agree: 0 (0%) Neither Agree nor Disagree: 9 (9%) Somewhat Disagree: 26 (25%) Strongly Disagree: 68 (66%)
The use of CPG is not encouraged by colleagues or employers	Strongly Agree: 2 (2%) Somewhat Agree: 10 (10%) Neither Agree nor Disagree: 24 (23%) Somewhat Disagree: 17 (16%) Strongly Disagree: 51 (49%)

CPG – Clinical Practice Guideline

Perspectives from the current survey on the necessity, importance, and value of the hamstring CPG were consistent with the results of a prior systematic review on evidence-based principals in physical therapy practice.⁸ The respondents showed minimal concern with barriers to utilizing CPGs, again highlighting their expertise. Similar to the systematic review findings of Mota et al,⁸ there was only a small percentage of respondents who felt a lack of support from colleagues or employers in utilizing CPGs. Two areas in which there was significantly less concern about utilizing and adopting CPGs were a lack of time and an inability to generalize the results. In both instances, the current respondents had fewer concerns with these issues than previously reported in the literature.

There were a few examination techniques that most of respondents felt were appropriate, but they were not specifically addressed or endorsed with a high recommendation grade from the available evidence in the HIAS CPG. Specifically, while assessing range of motion at relevant joints is a reasonable perspective during a differential examination, the guideline does not address the necessity of evaluating lumbar, hip, and/or knee active or passive range of motion (ROM). The evidence synthesis has a statement indicating strong evidence for ROM evaluation but does not offer a specific graded recommendation or endorsement. Similarly, the respondents routinely assessed hamstring flexibility. However, unlike the ROM assessment, hamstring flexibility

Table 6. Recognition of CPG Recommendations with moderate to strong evidence vs. expert opinion

RECOMMENDATION	FINDING
History of previous hamstring injury is a risk factor for re-injury ^B	*Yes: 104 (99% correct) No: 1
The examination should include quantification of strength with a handheld or isokinetic dynamometer ^A	*Yes: 95 (90% correct) No: 10
The examination should include an assessment of trunk and pelvic posture during functional movements	Yes: 69 *No: 36 (34% correct)
Hamstring Nordic curl training should be used to prevent hamstring injuries in athletes ^A	*Yes: 86 (82% correct) No: 21
Therapeutic modalities should be used to control pain and swelling early in the healing process ^F	Yes: 36 *No: 69 (66% correct)

^A - strong evidence^B - moderate evidence^F - expert opinion**Table 7. Application of moderate to strong recommendations to examination vignette**

Examination Element	FINDING
Assessment of lower extremity balance [±]	Yes: 23 *No: 82 (78% correct)
Hamstring strength assessment via dynamometry ^A	*Yes: 82 (78% correct) No: 23
Hamstring injury special tests [±]	Yes: 34 *No: 71 (68% correct)
Lumbar, hip, and/or knee range of motion [±]	Yes: 68 *No: 37 (35% correct)
Pain level (VAS or NPRS) ^B	*Yes: 73 (70% correct) No: 32
Patient-reported outcome measurement tool ^B	*Yes: 78 (74% correct) No: 27
Limb Length Discrepancy [±]	Yes: 7 *No: 98 (93% correct)
Postural Assessment (lumbopelvic or femoral position, inclination, torsion, or version) ^F	Yes: 28 *No: 77 (73% correct)
Previous Injury History ^B	*Yes: 103 (98% correct) No: 2
Quantification of hamstring flexibility ^A	*Yes: 88 (84% correct) No: 17
Quantification of other hip/knee muscle flexibility [±]	Yes: 36 *No: 69 (66% correct)
Hamstring tenderness location via palpation ^C	Yes: 92 (88% correct) *No: 13

^A - strong evidence^B - moderate evidence^C - weak evidence^F - expert opinion[±] - gap in knowledge

assessment is endorsed with a Grade A recommendation in the CPG.

There were only two intervention strategies that respondents frequently elected to provide in their treatment plan in the absence of grade A or B recommendations. While a comprehensive impairment-based program of stretching has a moderate (Grade B) recommendation, there is no specific delineation as to the mode of stretching that should be

utilized. Respondents were much more likely to provide dynamic, rather than static, stretching. This mimics the findings of Sherry and Best,¹⁶ who found a program of progressive and moderate velocity agility training to have better short-term outcomes and injury recurrence reduction than more traditional, 20-second hold static stretches.

While the CPG states that early range of motion and soft tissue mobilization may help promote more organized

Table 8. Application of moderate to strong recommendations to management vignette

Intervention Element	FINDING
Neuromuscular electrical stimulation [±]	Yes: 20 *No: 85 (81% correct)
Shockwave therapy [±]	Yes: 7 *No: 98 (93% correct)
Thermotherapy (cold/heat agents) [±]	Yes: 18 *No: 87 (83% correct)
Therapeutic Ultrasound [±]	Yes: 3 *No: 102 (97% correct)
Low-level laser therapy (photobiomodulation) [±]	Yes: 6 *No: 99 (94% correct)
Cupping [±]	Yes: 7 *No: 98 (93% correct)
Dry needling [±]	Yes: 21 *No: 84 (80% correct)
Soft tissue techniques (massage, myofascial release, active release, etc.) [±]	Yes: 44 *No: 61 (58% correct)
Taping or wrapping [±]	Yes: 9 *No: 96 (91% correct)
Thigh Sleeves [±]	Yes: 11 *No: 94 (90% correct)
Trunk stabilization activities ^B	*Yes: 72 (69% correct) No: 33
Static stretching techniques ^B	*Yes: 23 (22% correct) No: 82
Dynamic stretching techniques ^B	*Yes: 62 (59% correct) No: 43
Joint Mobilization [±]	Yes: 14 *No: 91 (88% correct)
Neural Mobilization ^F	Yes: 38 *No: 67 (64% correct)
Eccentric exercise training ^B	*Yes: 103 (98% correct) No: 2
Injury education and self-management advice	*Yes: 88 (84% correct) No: 17
Agility training ^B	*Yes: 77 (73% correct) No: 28
Progressive functional training activities ^B	*Yes: 89 (85% correct) No: 16

^B - moderate evidence^F - expert opinion[±]- gap in knowledge

scar formation with fewer adhesions to surrounding tissue, there is inadequate evidence with this intervention to recommend its usage. The CPG does not address soft tissue techniques such as massage and myofascial or active release. The value of these treatments is identified as a gap in the current knowledge that requires more investigation, despite most PTs including these techniques in their plan of care.

This study has limitations that should be discussed. First, it is a small sample size that captured the perspectives of advanced PTs with a personal stake in the care of athletes. It is unknown if these findings can be extrapolated to a broader group of PTs or to other CPGs. In addition, the validity of the clinical vignettes provided in this survey as

a proxy of actual clinical practice is unknown. These survey findings did not evaluate the clinical success of guideline adherence or the potential benefits or harms of its usage.

CONCLUSION

The current study results suggest that the HSIA CPG is widely recognized among physical therapists and viewed as a valuable tool for promoting evidence-based hamstring injury care. More than half of the surveyed clinicians reported active engagement with the guideline. Key strengths of the guideline included its ease of implementation, potential to improve patient outcomes, and ability to reduce unwarranted variation in treatment approaches. However,

a notable barrier to widespread adoption is the perception that the CPG may underestimate professional expertise and clinical autonomy. The results highlighted opportunities for improvement in guideline dissemination and comprehension. Future iterations of CPGs could focus on enhancing clarity and interpretability, making them more accessible for clinicians who may struggle with complex scientific language or nuanced clinical recommendations. Furthermore, the results suggest that clinicians' perceptions of the guideline's limitations and their overall interest in the CPG explained a significant portion of the variance in guideline utilization. These findings underscore the importance of striking a balance between standardized, evidence-based recommendations and respect for individual professional judgment. To enhance future guideline implementation, researchers and guideline developers might focus on explicitly acknowledging provider expertise and allowing flexibility for unique patient populations. This approach may

reduce implementation barriers and ultimately optimize rehabilitative outcomes.

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CONFLICTS OF INTEREST

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